

**E COMMERCE**

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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**SREE CHAITHANYA COLLEGE OF ENGINEERING**

**E COMMERCE**

BY

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# E COMMERCE

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B.Tech IV/CSE II<sup>nd</sup> semester

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## SYLLABUS

**UNIT-1:** Introduction, Electronic Commerce Framework, the Anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications.

**UNIT-2:** Consumer Oriented Applications, mercantile process models, mercantile models from the consumer's perspective, Mercantile from the merchant's perspective.

**UNIT-3:** Types of Electronic Payment Systems, Digital Token-Based Electronic Payment Systems, Smart Cards & Electronic Payment Systems, Credit Card- Based Electronic Payment Systems, Risk & Electronic Payment Systems, Designing Electronic Payment Systems.

**UNIT-4:** Electronic Data Interchange, EDI Applications in Business, EDI implementation, MIME, and value added networks.

**UNIT-5:** Intra organizational E-Commerce, Macro forces and Internal Commerce, Work flow automation and Coordination, Customization and Internal Commerce, Supply Chain Management(SCM).

**UNIT-6:** Making a business case for a Document Library, Digital document types, Corporate Data warehouses, Advertising and Marketing, the new age of Information Based Marketing, Advertising on Internet, charting the Online marketing process, Market Research.

**UNIT-7:** Consumer Search and Resource Discovery, information search and Retrieval, Electronic commerce catalogs or directories, Information Filtering.

**UNIT-8:** Multimedia and Digital video, Key Multimedia concepts, Digital Video & Electronic Commerce, Desktop Video Processing, Desktop Video Conferencing.

**Text Books:** 1.Frontiers of electronic commerce – Kalakota, Whinston, Pearson  
2. E-Commerce, S.Jaiswal – Galgotia

## Unit- I

### **1. Introduction:**

- It is a general concept covering any form of business transaction or information exchange executed using information and communication technologies (ICT's)
- It includes electronic trading of goods, services and electronic material.
- It takes place between companies, between companies and their customers, or between companies and public administrations.

They can be classified by application type:

#### **1. Electronic Markets**

- Present a range of offerings available in a market segment so that the purchaser can compare the prices of the offerings and make a purchase decision.

Example: Airline Booking System

#### **2. Electronic Data Interchange (EDI)**

- It provides a standardized system
- Coding trade transactions
- Communicated from one computer to another without the need for printed orders and invoices & delays & errors in paper handling
- It is used by organizations that make a large no. of regular transactions

Example: EDI is used in the large market chains for transactions with their suppliers

#### **3. Internet Commerce**

- It is used to advertise & make sales of wide range of goods & services.
- This application is for both business to business & business to consumer transactions.

Example: The purchase of goods that are then delivered by post or the booking of tickets that can be picked up by the clients when they arrive at the event

### **2. Scope of E-Commerce:**

- Internet e-commerce is one part of the overall sphere of e-commerce.

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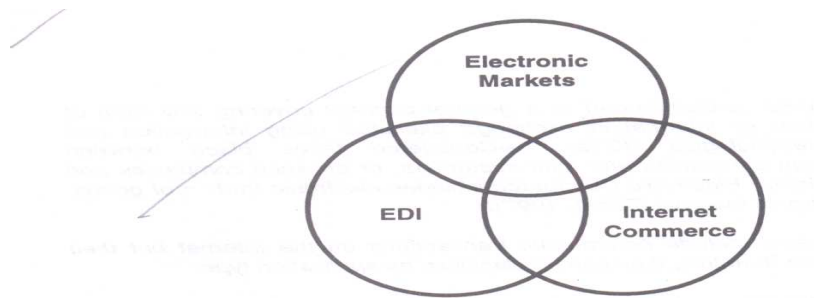


Fig. 1.1 The three categories of e-Commerce.

### 3. Electronic Commerce and the trade cycle:

- It can be applied to all, or to different phases of the trade cycle
- The trade cycle varies depending on
  - The nature of the organizations
  - Frequency of trade between the partners to the exchange
  - The nature of goods and services being exchanged
- Trade cycle support
  1. Finding goods and services (referred to as a search & negotiation)
  2. Placing the order, taking delivery & making payment (execution and settlement)
  3. After sales activities such as warranty, services etc.

#### The three generic trade cycles can be identified:

1. Regular, repeat transactions (repeat trade cycle)
2. Irregular transactions, where execution & settlement are separated (credit transactions)
3. Irregular transactions where execution & settlement are combined (cash transactions)

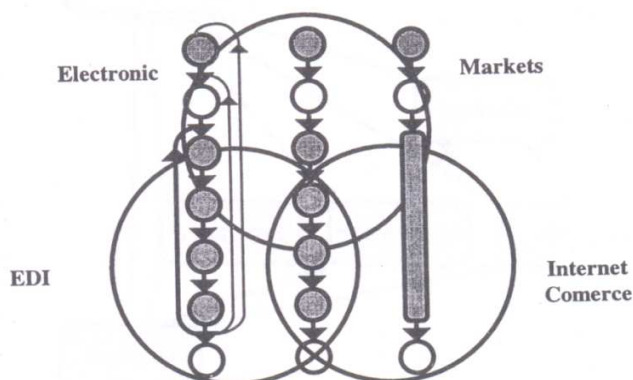


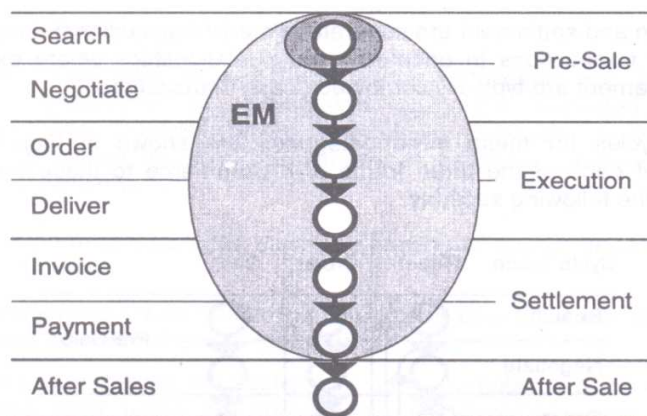
Fig. 1.6 e-Commerce Technologies and Generic Trade Cycles.

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## Electronic Markets:

- It increases the efficiency of the market
- It reduces the search cost for the buyer & makes it more likely that buyer will continue the search until the best buy is found
- It exist in commodity, financial markets & they are also used in airline booking system
- It is irregular transaction trade



cycle. **Fig. 1.3** Electronic Markets and Trade Cycle.

## Electronic Data Interchange:

- Applications are sending test results from the pathology laboratory to the hospital or dispatching exam results from exam boards to school
- It is used trade exchanges
- Users are vehicle assemblers, ordering components for the supermarkets
- It is used for regular repeat transactions
- It takes quite lot of work to set up systems
- It is part of schemes for just-in-manufacture and quick response supply
- Mature use of EDI allows for a change in the nature of the product or service
- Mass Customization is such an example

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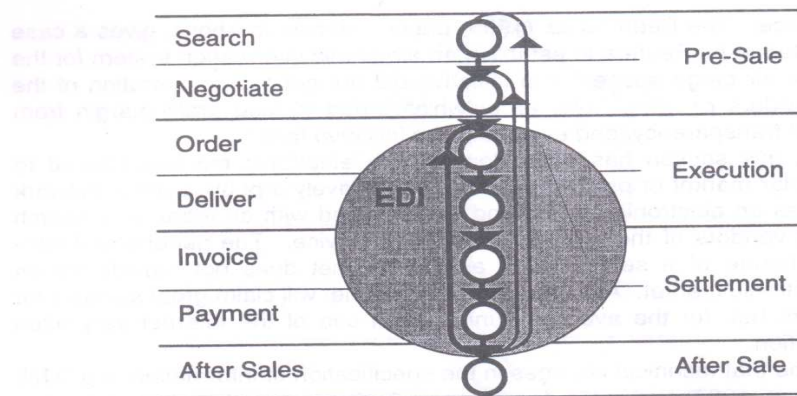


Fig. 1.4 EDI and the Trade Cycle.

## Internet Commerce:

- **The first stage**
  - Advertising appropriate goods and services
  - Internet sites offer only information & any further steps down the trade cycle are conducted on the telephone
- **The Second stage**
  - An increasing no. of sites offer facilities to execute & settle the transaction
  - Delivery may be electronic or by home delivery depending on the goods and services
- **The final stage**
  - After-sales service
  - On-line support & On-Line services.

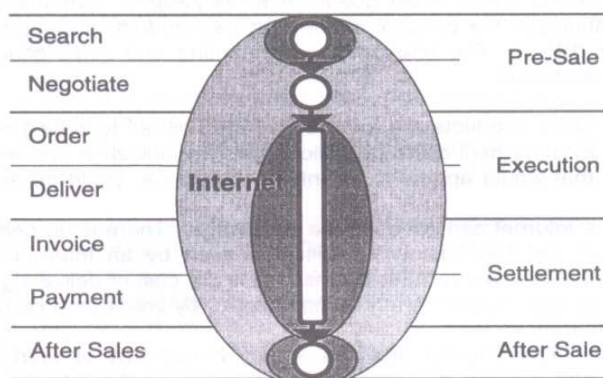


Fig. 1.5 Internet and the Trade Cycle.

## **Generic Framework of Electronic Commerce**



### 3. Electronic Commerce Framework

- E-Commerce application will be built on the existing technology infrastructure
  - A myriad of computers
  - Communication networks
  - Communication software
- Common business services for facilitating the buying and selling process
- Messaging & information distribution as a means of sending and retrieving information
- Multimedia content & network publishing, for creating a product & a means to communicate about it
- The information superhighway- the very foundation-for providing the high way system along which all e-commerce must travel
- The two pillars supporting all e-commerce applications & infrastructure
- Any successful e-commerce will require the I-way infrastructure in the same way that regular commerce needs
- I-way will be a mesh of interconnected data highways of many forms
  - Telephone,wires,cable TV wire
  - Radio-based wireless-cellular & satellite
- Movies=video + audio

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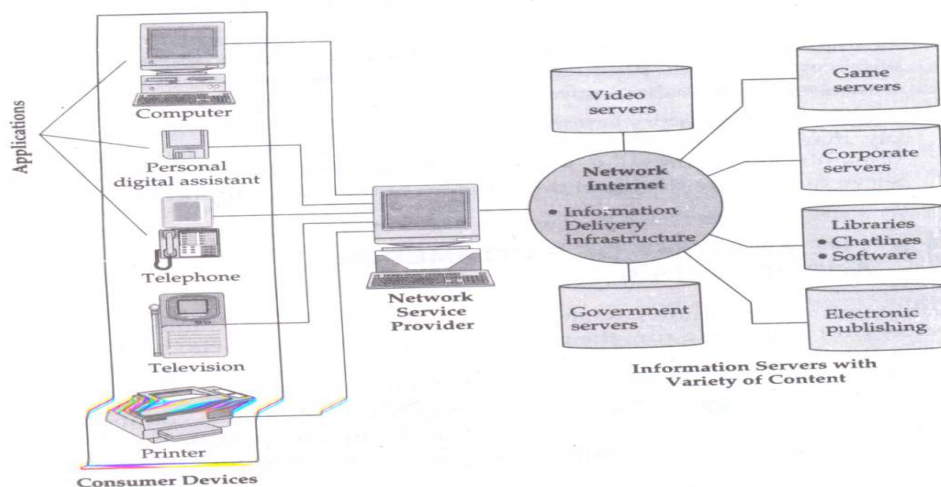
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- Digital games=music + video + software
- Electronic books=text + data + graphics + music + photographs + video
- In the electronic 'highway system' multimedia content is stores in the form of electronic documents
- These are often digitized
- On the I-way messaging software fulfills the role, in any no. of forms: e-mail, EDI, or point-to-point file transfers
- Encryption & authentication methods to ensure security
- Electronic payment schemes developed to handle complex transactions
- These logistics issues are difficult in long-established transportation

## 4. Anatomy of E-Commerce applications

**E-Commerce applications are:**

1. Multimedia Content for E-Commerce Applications
2. Multimedia Storage Servers & E-Commerce Applications
  - i. Client-Server Architecture in Electronic Commerce
  - ii. Internal Processes of Multimedia Servers
  - iii. Video Servers & E-Commerce
3. Information Delivery/Transport & E-Commerce Applications
4. Consumer Access Devices



**Figure 1.2** Elements of electronic commerce applications



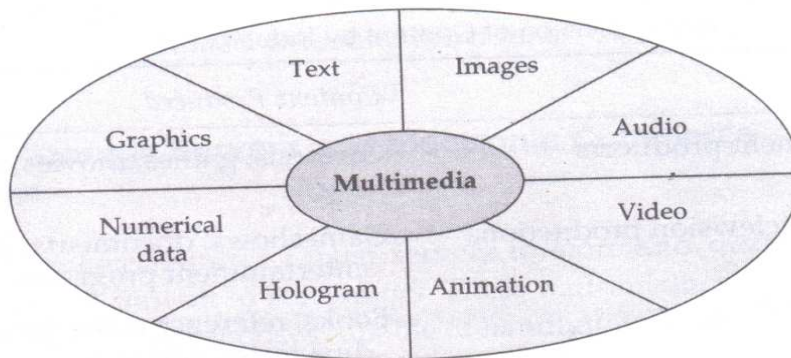
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## Multimedia Content for E-Commerce Applications

- Multimedia content can be considered both fuel and traffic for electronic commerce applications.
- The technical definition of multimedia is the use of digital data in more than one format, such as the combination of text, audio, video, images, graphics, numerical data, holograms, and animations in a computer file/document.
- Multimedia is associated with Hardware components in different networks.
- The Accessing of multimedia content depends on the hardware capabilities of the customer.

Chapter 1



**Figure 1.3** Possible components of multimedia

## Multimedia Storage Servers & E-Commerce Applications:

- E-Commerce requires robust servers to store and distribute large amounts of digital content to consumers.
- These Multimedia storage servers are large information warehouses capable of handling various content, ranging from books, newspapers, advertisement catalogs, movies, games, & X-ray images.
- These servers, deriving their name because they serve information upon request, must handle large-scale distribution, guarantee security, & complete reliability

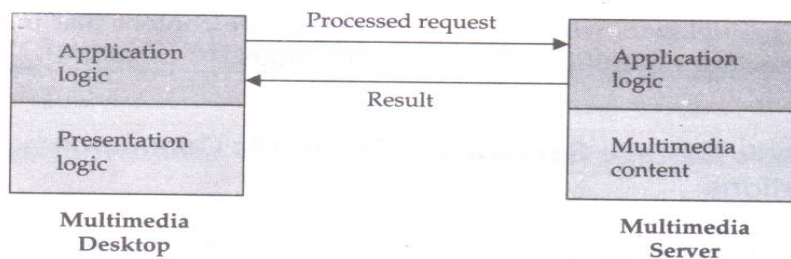
### i. Client-Server Architecture in Electronic Commerce

- All e-commerce applications follow the client-server model

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- Clients are devices plus software that request information from servers or interact known as message passing
- Mainframe computing , which meant for “dump”
- The client server model, allows client to interact with server through request-reply sequence governed by a paradigm known as message passing.
- The server manages application tasks, storage & security & provides scalability-ability to add more clients and client devices (like Personal digital assistants to Pc’s. See in fig.



**Figure 1.4** Distribution of processing in multimedia client–server world

### ii. Internal Processes of Multimedia Servers

- The internal processes involved in the storage, retrieval & management of multimedia data objects are integral to e-commerce applications.
- A multimedia server is a hardware & software combination that converts raw data into usable information & then dishes out.
- It captures, processes, manages, & delivers text, images, audio & video.
- It must do to handle thousands of simultaneous users.
- Include high-end symmetric multiprocessors, clustered architecture, and massive parallel systems.

### iii. Video Servers & E-Commerce

The electronic commerce applications related to digital video will include

1. Telecommunicating and video conferencing
2. Geographical information systems that require storage & navigation over maps
3. Corporate multimedia servers
4. Postproduction studios
5. Shopping kiosks.



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## **E-Commerce Consumer applications:**

- People needs entertainment on demand including video, games, news on-demand, electronic retailing via catalogs etc.
- Currently now we are taking the video on-demand.
- Why most companies betting heavily on this?
  1. 93 million homes have television
  2. Americans spend nearly half their free time watching television
  3. Every evening, more than one-third of the population is in front of a television
  4. Sight, sound, and motion combine to make television a powerful means of marketing

## **1. Consumer Applications and Social Interaction:**

- Lessons from history indicate that the most successful technologies are those that make their mark social
- In 1945, in U.S no one had TV. By 1960 about 86percent of households did
- Now contrast with Telephone. Bell invented the telephone in 1876 and by1940, 40% of U.S. households and by 1980 about 95-98 percent of households connected
- Penetration was slower for Telephone than for TV because of the effort needed to set up the wiring infrastructure
  - The impact of both was good on business, social, consumer behavior and entertainment habits
  - Radio began in 1960, and by 1989, almost 3 decades later, just 319 radio stations followed the news format
  - In 1994, their number exceeded 1000

## **What do Consumers really want?**

1. They want quality and cost of service
2. If a new system requires more steps to do essentially the same things, consumers may resist it
3. Some people fit that mold, but most of public prefers to lay back and just watch television and let someone else do the work of figuring out the sequence of television programming

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### **What are Consumers willing to spend?**

1. According to the video on-demand, consumers get the cable bill at basic charge they will buy
2. If it is doubled they will not buy and at the service provider economics will increased then network operators might look to advertises to fill the gap

### **Delivering products to Consumers**

1. Packing and distribution must be considered
2. Blockbuster video collects the information and shows the typical consumer
3. Spends \$12 a month on home video expenditures
4. Go to video store to select video on limited budget and has time to kill
5. Only periodically expends a large sum of money

### **Consumer Research and E-Commerce**

Consumer opinion about interactive television is

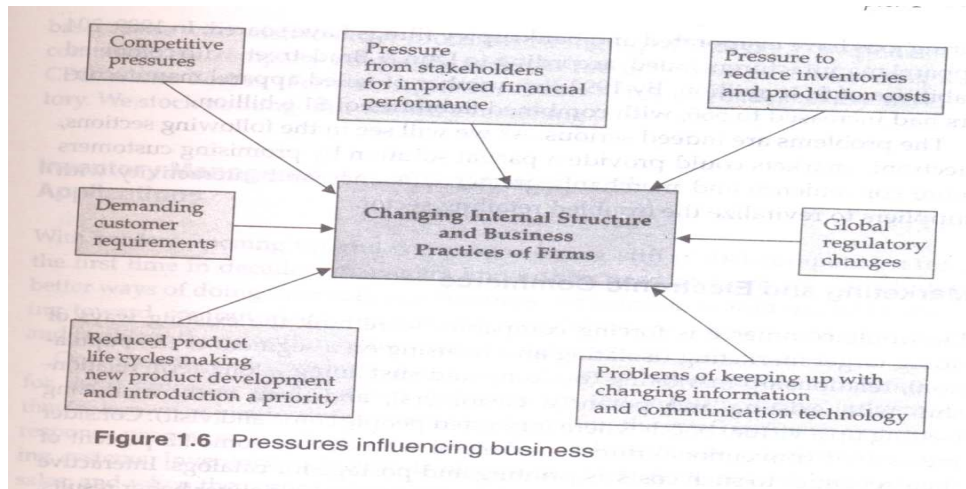
- 46% be willing to pay
- 39% want video phone calls
- 63% would pay for movies on-demand
- 57% would pay for Television shows on-demand
- 78% said their worry about it is that they will pay for something that they previously received free of charge
- 64% are think it make it harder for viewers to protect privacy
- 41% are tell that it is too confusing to use

### **Changing business Environment**

1. The traditional business environment is changing rapidly
2. Many companies are looking outside and within to shape business strategies
3. These activities include private electronic connections to customers,suppliers,distributors,industry groups etc
4. The I-superhighway will expand this trend so that it allow business to exchange information.

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### E-Commerce and the retail Industry

1. Conditions are changing in the “new economy” with respect to the retail industry
2. Consumers are demanding lower prices, better quality, a large selection of in-season goods.
3. Retailers are filling their order by slashing back-office costs, reducing profit margins, reducing cycle times. buying more wisely and making huge investments in technology
4. Retailers are in the immediate line of fire and were first to bear the brunt of cost cutting

### Marketing and E-Commerce

1. E-commerce is forcing companies to rethink the existing ways of doing target marketing and even event marketing.
2. Interactive marketing is in electronic markets via interactive multimedia catalogs
3. Users find moving images more appealing than still image and listening more appealing than reading text on a screen
4. Consumer information services are a new type of catalog business

### Inventory Management and Organizational Applications

1. With borders opening up and companies facing stiff global competition
2. Adaptation would include moving to computerized, “paperless” operations to reduce
3. Once targeted business process is inventory management, solutions for these processes go by different names
4. In manufacturing industry they’re known as just-in-time inventory systems, in the retail as quick response programs, and in transportation industry as consignment tracking systems

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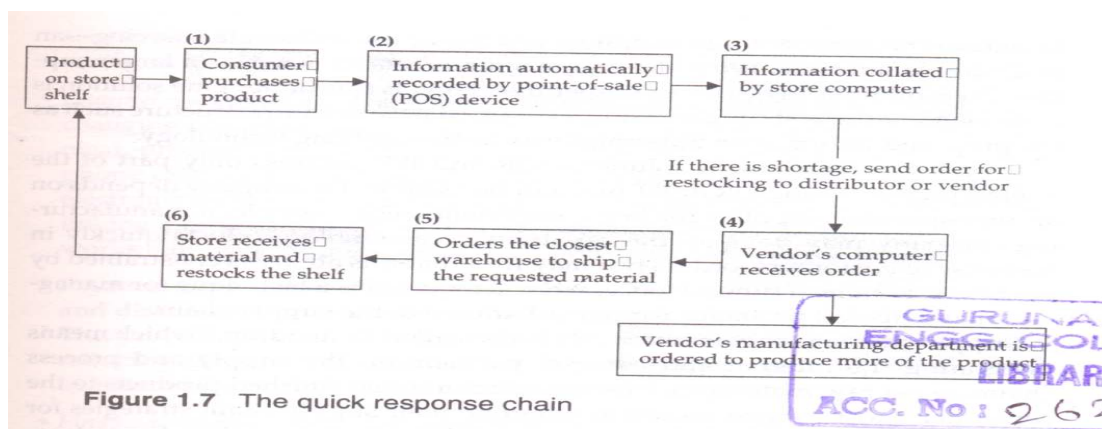
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### Just-in-Time (JIT) Manufacturing

1. It is viewed as an integrated management system consisting of a number of different management practices dependent on the characteristics of specific plants
2. The first principle is elimination of all waste (time, materials, labour & equipment)
3. The following management practices are focused factory, reduced set-up times, group technology, total productive maintenance, multifunction employees, uniform workloads, IT purchasing, kanban total quality control & quality circles

### Quick Response Retailing (QR)

1. It is a version of JIT purchasing tailored for retailing
2. To reduce the risk of being out of stock, retailers are implementing QR systems
3. It provides for a flexible response to product ordering and lowers costly inventory levels
4. QR retailing focuses on market responsiveness while maintaining low levels of stocks
5. It creates a closed loop consisting of retailer, vendor, & consumer chain, & as consumers make purchases the vendor orders new deliveries from the retailer through its computer network



### Supply Chain Management

1. QR and JIT address only part of the overall picture
2. Supply Chain Management (SCM) is also called “extending”, which means integrating the internal and external partners on the supply and process chains to get raw materials to the manufacturer and finished products to the consumer
3. It includes following functions
  - Supplier management: The goal is to reduce the number of suppliers and get them to partners

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- Inventory management: The goal is to shorten the order-ship-bill cycle. When a majority of partners are electronically linked, information faxed or mailed
- Distribution management: The goal is to move documents (accurate data) related to shipping
- Channel management: The goal is to quickly disseminate information about changing operational conditions ( technical, product, and pricing information) to trading partners
- Payment management: The goal is to link company and the suppliers and distributors so that payments can be sent and received electronically
- Financial management: The goal is to enable global companies to manage their money in various foreign exchange accounts
- Sales force productivity: The goal is to improve the communication flow of information among the sales, customer & production functions

In sum, the supply chain management process increasingly depends on electronic markets

### **Work group Collaboration Applications:**

1. A internetwork that enables easy and inexpensive connection of various organizational segments
2. It is to improve communications and information sharing and to gather and analyze competitive data in real-time
3. Videoconferencing, document sharing and multimedia e-mail, are expected to reduce travel and encourage telecommuting
4. Improves the distribution channel for documents and records to suppliers, collaborators and distributors



## Unit- II

### CONSUMER-ORIENTED APPLICATIONS

- The wide range of applications envisioned for the consumer marketplace can be broadly classified into:
  - (i) Entertainment
  - (ii) Financial Services and Information
  - (iii) Essential Services
  - (iv) Education and Training

#### Consumer Life-Style Needs

- Entertainment
- Financial Services and Financial news.
- Essential Services remote diagnostics.
- Education and Training conferencing, on-line databases.

#### Complementary Multimedia Services

- Movies on demand, video cataloging, interactive Ads, Multi-user games, on-line discussions.
- Home Banking, Financial services, Information,
- Home Shopping, Electronic Catalogs, telemedicine,
- Interactive education, multiuser games, video

#### 1. Personal Finance and Home Banking Management

- (i) Basic Services
- (ii) Intermediate Services
- (iii) Advanced services

#### 2. Home Shopping

- (i) Television-Based Shopping
- (ii) Catalog-Based Shopping

#### 3. Home Entertainment

- (i) Size of the Home Entertainment Market
- (ii) Impact of the Home Entertainment on Traditional Industries

#### 4. Micro transactions of Information

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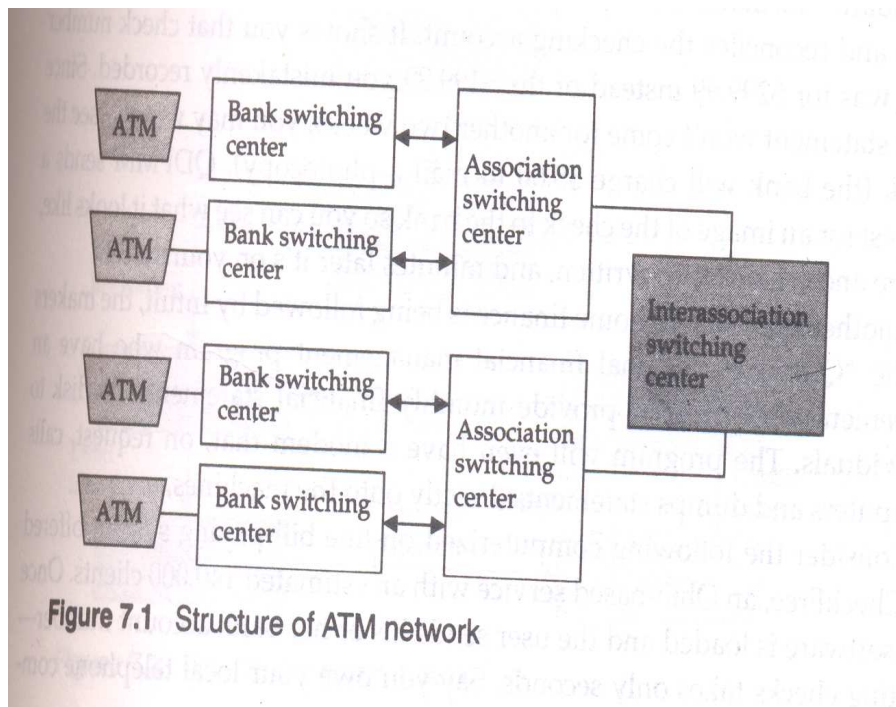
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## 1. Personal Finance and Home Banking Management:

- The newest technologies are direct deposit of payroll, on-line bill payment and telephone transfers
- The technology for paying bills, whether by computer or telephone, is infinitely more sophisticated than anything on the market a few years ago
- In 1980s were the days of “stone age” technology because of technology choices for accessing services were limited
- For home banking, greater demands on consumers and expanding need for information, it's services are often categorized as basic, intermediate and advanced

### (i) Basic services

- These are related to personal finance
- The evolution of ATM machines from live tellers and now to home banking
- The ATM network has with banks and their associations being the routers and the ATM machines being the heterogeneous computers on the network.
- This interoperable network of ATMs has created an interface between customer and bank that changed the competitive dynamics of the industry. See in next figure
- Increased ATM usage and decrease in teller transactions
- The future of home banking lies with PC's

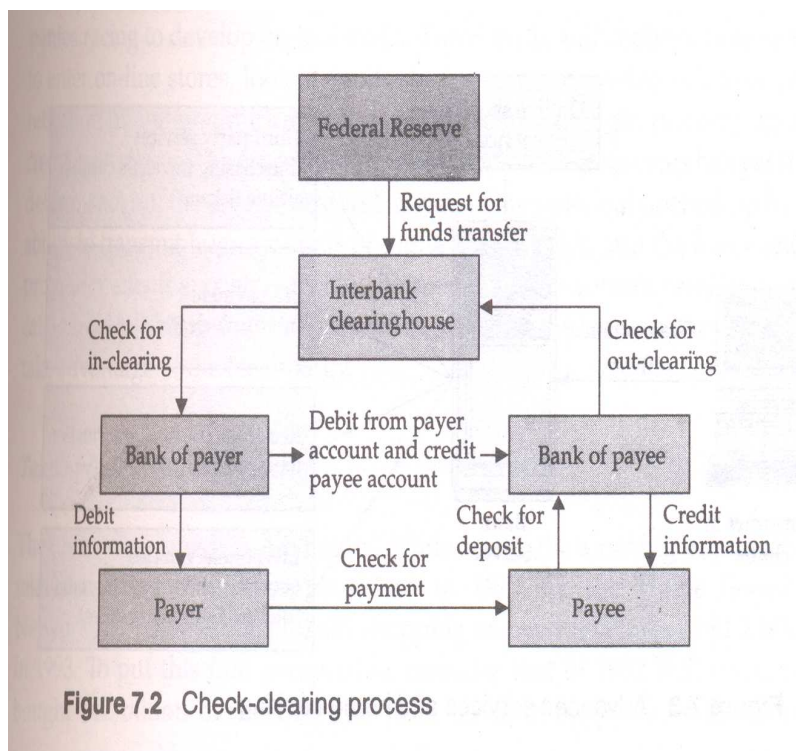


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### (ii) Intermediate Services

- The problem with home banking in 1980 is, it is expensive service that requires a PC, a modem and special software
- As the equipment becomes less expensive and as bank offers broader services, home banking develop into a comprehensive package that could even include as insurance entertainment
- Consider the computerized on-line bill-payment system
- It never forgets to record a payment and keeps track of user account number, name, amount and the date and we used to instruct with payment instructions. See in Fig;



### (iii) Advanced Services

- The goal of advanced series is to offer their on-line customers a complete portfolio of life, home, and auto insurance along with mutual funds, pension plans, home financing, and other financial products
- The Figure explains the range of services that may well be offered by banks in future
- The services range from on-line shopping to real-time financial information from anywhere in the world
- In short, home banking allows consumers to avoid long lines and gives flexibility

## 2. Home Shopping:

- It is already in wide use.
- This enable a customer to do online shopping

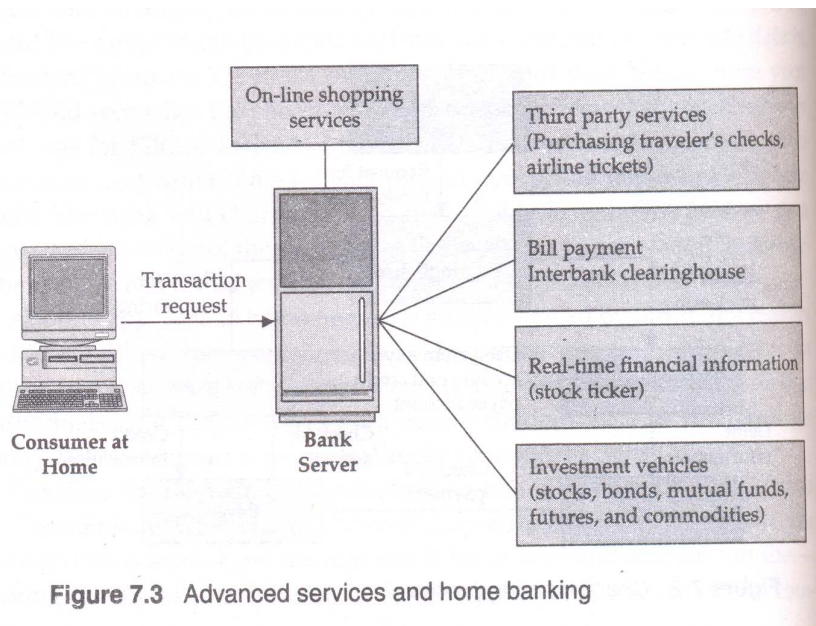


Figure 7.3 Advanced services and home banking

### (i) Television-Based Shopping:

- It is launched in 1977 by the Home Shopping Network (HSN).
- It provides a variety of goods ranging from collectibles, clothing, small electronics, house wares, jewelry, and computers.
- When HSN started in Florida in 1977, it mainly sold factory overruns and discontinued items
- It works as, the customer uses her remote control at shop different channels with touch of button. At this time, cable shopping channels are not truly interactive

### (ii) Catalog-Based Shopping

- In this the customer identifies the various catalogs that fit certain parameters such as safety, price, and quality
- The on-line catalog business consists of brochures , CD-ROM catalogs, and on-line interactive catalogs
- Currently, we are using the electronic brochures

### 3. Home Entertainment:

- It is another application for e-commerce
- Customer can watch movie, play games, on-screen catalogs, such as TV guide.
- In Home entertainment area, customer is the control over programming
- In Table tells the, What will be required in terms of Television-based technology for this telemart to become a reality

#### The Telemart: Present and Future Functions

- |  |   |
|--|---|
| • Compressing and decoding a digital signal(images are compress to reduce quantity of information) | The transition to digital satellite and cable network head broad casting involves linking the TV to decoder to reconvert into an analog signal  |
| • Decoding a scrambled signal  | The broad casting of pay channel requires the encryption of the signal on emission & unscrambled  |
| • Rapid loading of program on memory   | An increase in the no. of individual interactive services is possible only if n/w overloading is kept minimum   |
| • Electronic money or card payment terminal  | Once separated from the telephone, telemart will need a keyboard up to the TV set in order to ensure interactivity. The keyboard will have a payment connection to simplify the billing process |

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## Advanced Services

### Size of the home Entertainment Market:

- Entertainment services are play a major role in e-commerce
- This prediction is underscored by the changing trends in consumer behavior.
- It is shown in Table

### Impact of Home entertainment on traditional industries:

- This will have devastating effects on theater business
- Economic issues might allow theaters to maintain an important role in the movie industry
- Today average cable bill is approximately \$30 a month

#### Industry Estimates of consumer Expenditures

	1980 (\$4.7 bin)		1990 (\$31.0 bin)		1993 (\$37.8 bin)	
Theaters	49.0%	\$2.3	14.5%	\$4.5	13.2%	\$5.0
Basic cable	35.0%	\$1.6	34.5%	\$10.7	36.9%	\$13.9
Premium cable	16.0%	\$0.8	16.5%	\$5.1	14.0%	\$5.3
Home video	—	—	33.8%	\$10.5	34.8%	\$13.2
Pay per view	—	—	0.7%	\$0.2	1.1%	\$0.4

### 4. Micro transactions of information:

- One change in traditional business forced by the on-line information business is the creation of a new transaction category called small-fee transactions for micro services
- The customer by giving some information away for free and provide information bundles that cover the transaction overhead.
- The growth of small-money transfers could foster a boom in other complementary information services
- The complexity is also increased in micro services when an activity named, reverification is entered.
- It means checking on the validity of the transaction after it has been approved

### Desirable Characteristics of an Electronic marketplace

- Critical mass of Buyers and sellers: To get critical mass, use electronic mechanisms

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- Opportunity for independent evaluations and for customer dialogue and discussion: Users not only buy and sell products, they compare notes on who has the best products and whose prices are outrageous
- Negotiation and bargaining: Buyers and sellers need to be able to haggle over conditions of mutual satisfaction, money, terms & conditions, delivery dates & evaluation criteria
- New products and services: Electronic marketplace is only support full information about new services
- Seamless interface: The trading is having pieces work together so that information can flow seamlessly
- Resource for disgruntled buyers: It provide for resolving disagreements by returning the product.

### **Mercantile Process models**

- Mercantile processes define interaction models between consumers and merchants for on-line commerce

### **Mercantile Models from the Consumer's Perspective**

- (i) Pre purchase preparation: The pre purchase preparation phase include search and discovery for a set of products to meet customer requirements
- (a) The consumer information search process.
  - (b) The Organizational search process.
  - (c) Consumer search experiences.
  - (d) Information brokers & brokerages.
- (ii) Purchase consummation: The purchase consummation phase include mercantile protocols
- (a) Mercantile process using digital cash.
  - (b) Mercantile transaction using credit cards.
  - (c) Costs of electronic purchasing.
- (iii) Post purchase interaction: The post purchase interaction phase includes customer service & support

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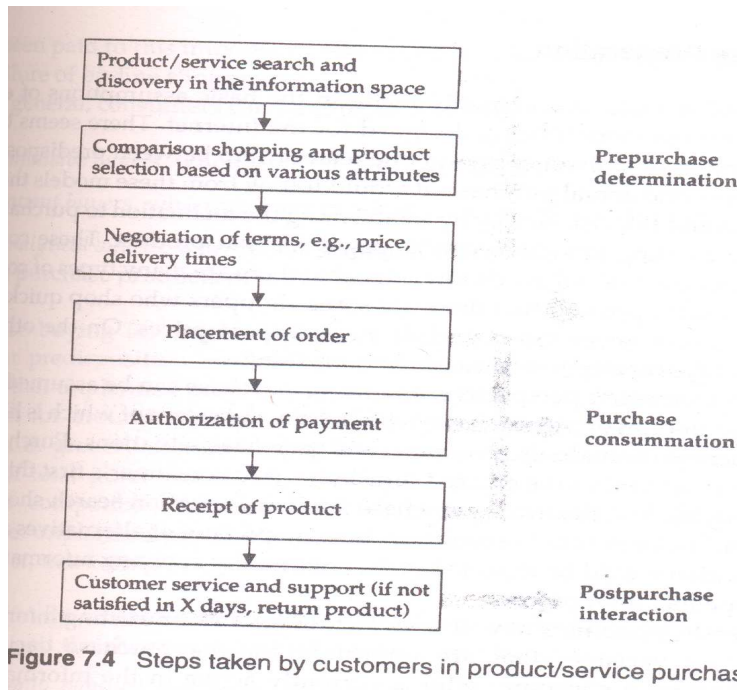


Figure 7.4 Steps taken by customers in product/service purchasing

### (i) Pre purchase Preparation

- The purchase is done by the buyers, so consumers can be categorized into 3 types
- Impulsive buyers, who purchase products quickly
- Patient buyers, purchase products after making some comparisons
- Analytical buyers, who do substantial research before making decision to purchase products,.

### Marketing researches have several types of purchasing:

- Specifically planned purchases
- Generally planned purchases
- Reminder purchase
- Entirely unplanned purchases

### The consumer information search process

- Information search is defined as the degree of care, perception,& effort directed toward obtaining data or information related to the decision problem

### The Organizational search process

- Organizational search can be viewed as a process through which an organization adapts to such changes in its external environment as new suppliers, products, & services.



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### Consumer Search Experiences

- The distinction between carrying out a shopping activity “to achieve a goal” (utilitarian) as opposed to doing it because “u love it” (hedonic).

### Information Brokers and Brokerages

- To facilitate better consumer and organizational search, intermediaries called information brokers or brokerages
- Information brokerages are needed for 3 reasons: Comparison shopping, reduced search costs, and integration

### (ii) Purchase Consummation

- Buyer contacts vendor to purchase
- Vendor states price
- Buyer and Vendor may or may not engage in negotiation
- If satisfied, buyer ask the payment to the vendor
- Vendor contacts billing service
- Billing service decrypts authorization and check buyers account balance
- Billing service gives to the vendor to deliver product
- Vendor delivers the goods to buyer
- On receiving the goods, the buyer signs and delivers receipt
- At the end of the billing cycle, buyer receives a list of transactions

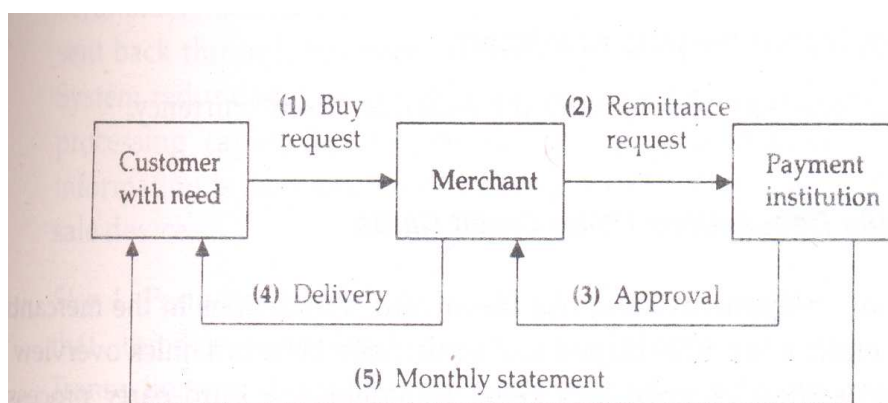


Figure 7.5 Simplified on-line mercantile model

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### **Mercantile process using Digital Cash**

- Buyer obtains e-cash from issuing bank
- Buyer contacts seller to purchase product
- Seller states price
- Buyer sends e-cash to seller
- Seller contacts his bank or billing service to verify the validity of the cash
- Bank gives okay signal
- Seller delivers the product to buyer
- Seller then tells bank to mark the e-cash as “used” currency

### **Mercantile Transactions Using Credit Cards**

- Two major components compromise credit card transactions in this process: electronic authorization and settlement
- In retail transaction, a third-party processor (TPP) captures information at the point of sale, transmits the information to the credit card issuer for authorization, communicates a response to the merchant and electronically stores the information for settlement and reporting.
- The benefits of electronic processing include the reduction in credit losses, lower merchant transaction costs, & faster consumer checkout & merchant-to-bank settlement

A step-by-step account of retail transaction follows:

- Step1: A customer presents a credit card for payment at a retail location
- Step2: The point-of-sale software directs the transaction information to the local network
- Step3: System verifies the source of the transaction and routes it.
- Step4: In this, transaction count and financial totals are confirmed between the terminal and the network
- Step5: In this, the system gathers all completed batches and processes the data in preparation for settlement

A merchant client takes one of two forms:

- Merchants are charged a flat fee per transaction for authorization and data capture services
- The other form of billing allows merchants to pay a “bundled” price for authorization, data capture, & settlement

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### **Cost of Electronic Purchasing:**

- Cash seems to be preferable to electronic payments, such as, on-line debit, credit, and electronic check authorization
- Consumers appear to spend more when using cards than when spending cash

### **(iii) Post purchase Interaction**

- Returns and claims are an important part of the purchasing process
- Other complex customer service challenges arise in customized retailing are:

Inventory issues: To serve the customer properly, a company should inform a customer right away and if the item is in stock, a company must be able to assign that piece to customer

Database access and compatibility issues: Customers should get kind of services by easy issues like calling an 800 number

Customer service issues: To clear the doubts of customer about product

### **Mercantile Models from the Merchant's Perspective**

- To better understanding, it is necessary to examine the order management cycle (OMC).
- The OMC includes eight distinct activities.
- The actual details of OMC vary from industry to industry and also for individual products and services
- OMC has generic steps
  - (i) Order planning & Order generation.
  - (ii) Cost estimation & pricing.
  - (iii) Order receipt & entry.
  - (iv) Order selection & prioritization.
  - (v) Order Scheduling
  - (vi) Order fulfillment & delivery.
  - (vii) Order billing & account/payment management.
  - (viii) Post sales service.

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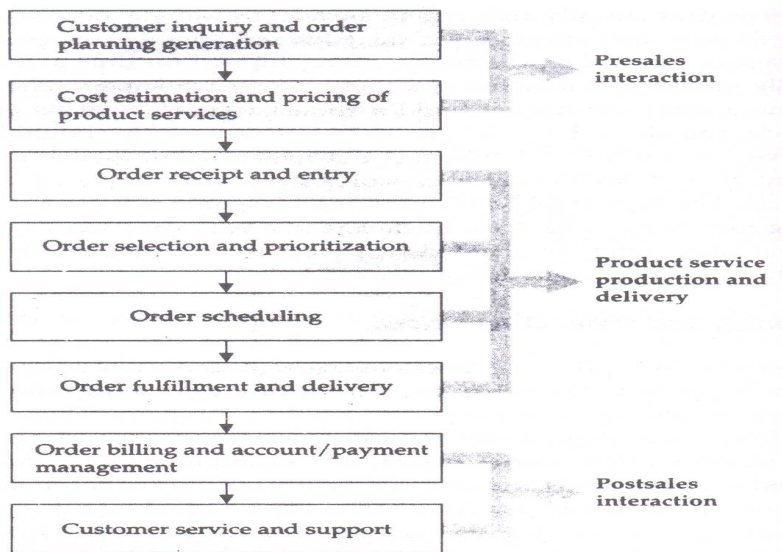


Figure 7.6 Order management cycle in e-commerce

## Order planning & order Generation

- Order planning leads to order generation.
- Orders are generated in a no. of ways in the e-commerce environment.
- The sales force broadcasts ads (direct marketing), sends personalized e-mail to customers (cold calls), or creates a WWW page

## Cost Estimation & pricing

- Pricing is the bridge between customer needs & company capabilities.
- Pricing at the individual order level depends on understanding the value to the customer that is generated by each order, evaluating the cost of filling each order; & instituting a system that enables the company to price each order based on its value & cost

## Order Receipt & Entry

- After an acceptable price Quote, the customer enters the order receipt & entry phase of OMC.
- This was under the purview of departments variously titled customer service, order entry, the inside sales desk, or customer liaison.

## Order Selection & Prioritization

- Customer service representatives are also often responsible for choosing which orders to accept and which to decline.
- Not, all customers' orders are created equal; some are better for the business.

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### **Order Scheduling**

- In this phase the prioritized orders get slotted into an actual production or operational sequence.
- This task is difficult because the different functional departments- sales, marketing,, customer service, operations, or production- may have conflicting goals, compensation systems, & organizational imperatives:

Production people seek to minimize equipment changeovers, while marketing & customer service reps argue for special service for special customers.

### **Order Fulfillment & Delivery**

- In this actual provision of the product or service is made.
- It involves multiple functions and locations.

### **Order Billing & Account/Payment Management**

- After the order has been fulfilled & delivered, billing is given by finance staff.
- The billing function is designed to serve the needs and interests of the company, not the customer.

### **Post sales Service**

- This phase plays an increasingly important role in all elements of a company's profit equation: customer, price, & cost.
- It can include such elements as physical installation of a product, repair & maintenance, customer training, equipment upgrading & disposal.

## Unit- III

### 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)

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## 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

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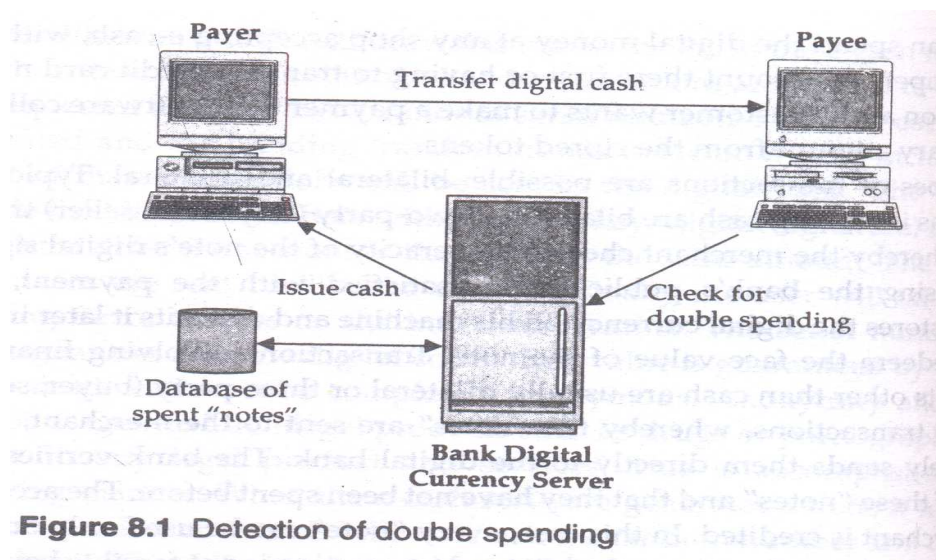
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- Maintaining enough money in the account to bank the purchase.

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.



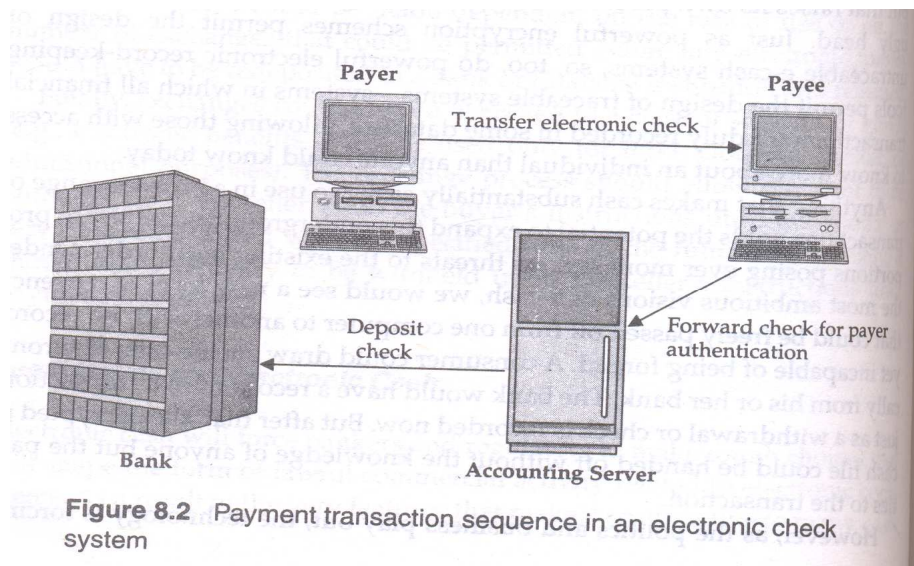
### Electronic Checks

- 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



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### 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

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## 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.

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- Software packaged with your electronic commerce software can handle payment card processing automatically.

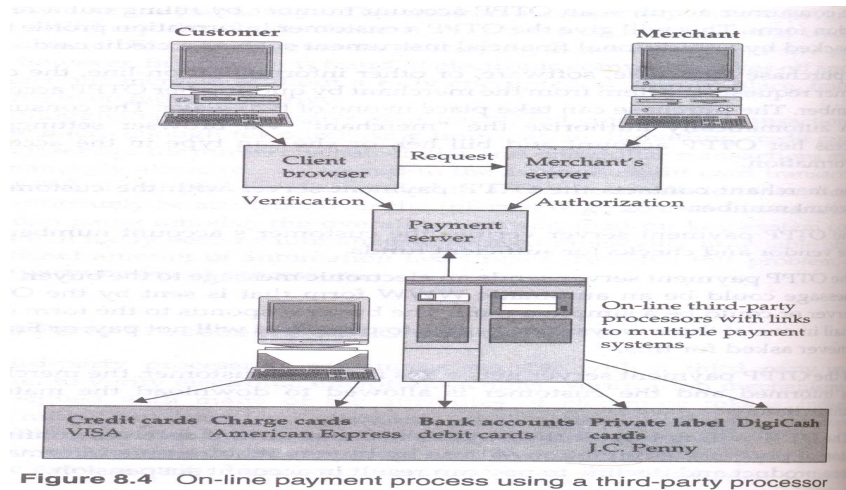


Figure 8.4 On-line payment process using a third-party processor

- 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

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### 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

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- 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.

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## Unit- IV

### 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

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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

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## 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
- 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.

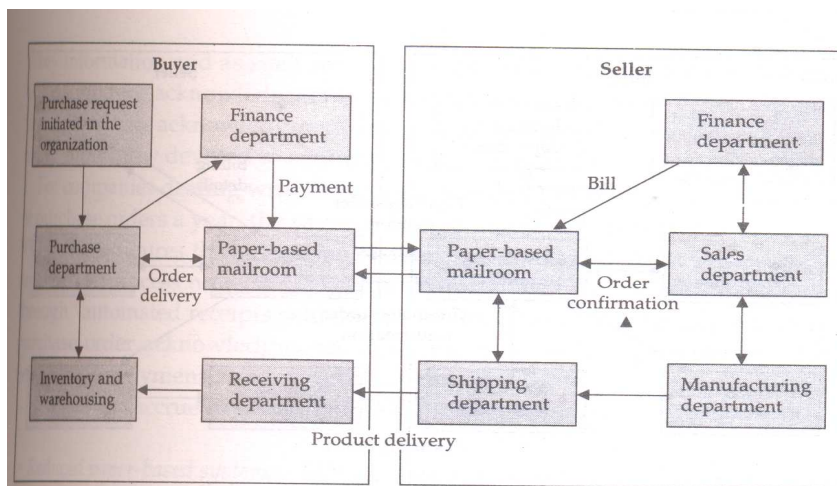


Figure 9.2 Information flow without EDI

## 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



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8. Seller sends invoice to buyer
9. Buyer sends payment to seller

EDI as a fast, inexpensive & safe method

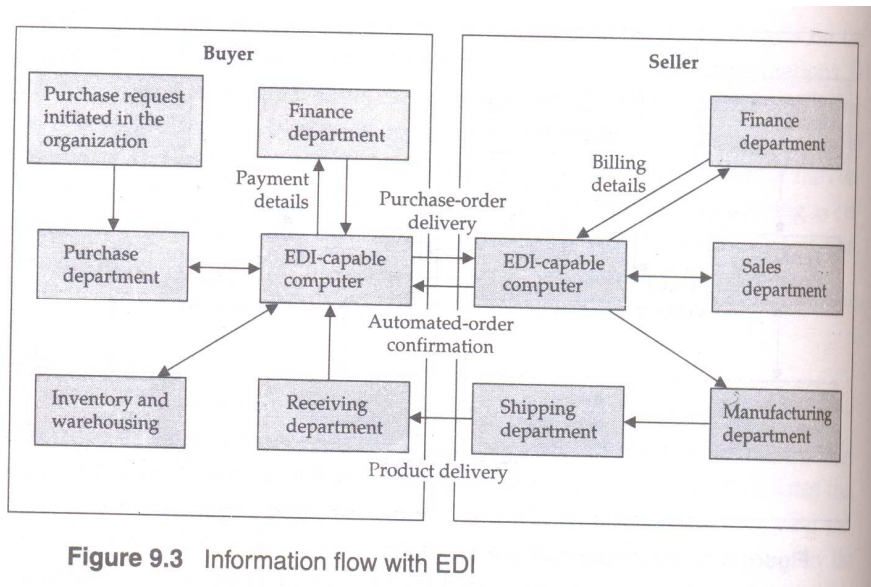


Figure 9.3 Information flow with EDI

### 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
5. **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

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## **Role of EDI in international trade**

- EDI facilitates the smooth flow of information
- It reduces paper work
- EDI benefits for international trade are
  1. Reduced transaction expenditures
  2. Quicker movement of imported & exported goods
  3. Improved customer service through “track & trace” programs
  4. Faster customs clearance & reduced opportunities for corruption, a huge problem in trade

## **2. Interbank Electronic Funds Transfer (EFT)**

- EFTS is credit transfers between banks where funds flow directly from the payer’s bank to the payee’s bank.
- The two biggest funds transfer services in the United States are the Federal Reserve’s system, Fed wire, & the Clearing House Interbank Payments System (CHIPS) of the New York clearing house

## **Automated Clearinghouse (ACH) Transfers**

- ACH transfers are used to process high volumes of relatively small-dollar payments for settlement in one or two business days
- It provides services: preauthorized debits, such as repetitive bill payments; & consumer-initiated payments.

## **3. Health care EDI for insurance EDI**

- Providing good & affordable health care is a universal problem
- EDI is becoming a permanent fixture in both insurance & health care industries as medical 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 via communication lines to the value-added network service provider
- The company then edits sorts & distributes forms to the payer. If necessary, the insurance company can electronically route transactions to a third-party for price evaluation
- Claims submission also receives reports regarding claim status & request for additional information

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## 4. Manufacturing & retail procurement using EDI

- These are heavy users of EDI
- In manufacturing, EDI is used to support just-in-time.
- In retailing, EDI is used to support quick response

### Just-In-Time & EDI

- Companies using JIT & EDI calculates how many parts are needed each day based on the production schedule & electronically transmit orders.
- Delivery has to be responsive, or it will cost too much in money & time.
- Getting data to suppliers quickly
- A major benefit of JIT & EDI is a streamlined cash flow.

### Quick Response & EDI

- For the customer, QR means better service & availability of a wider range of products
- For the retailer & supplier, QR may mean survival in a competitive marketplace
- Much focus of QR is in reduction of lead times using event-driven EDI.
- In QR, EDI documents include purchase orders, shipping notices, invoices, inventory position, catalogs, & order status

## EDI: Legal, Security, & Privacy Issues

### Legal Status of EDI Messages

- To understand the legal framework, let's take a look on three modes of communication types: Instantaneous communication, delayed communication via the U.S. Postal Service (USPS), & delayed communication via non-USPS couriers;
1. Instantaneous. If the parties are face to face or use an instantaneous communication medium such as the telephone
  2. Delayed (USPS). The "mailbox rule" provides that an acceptance communicated via USPS mail is effectively when dispatched
  3. Delayed (non-USPS). Acceptances transmitted via telegram, mailgram, & electronic messages, are communicated & operable upon receipt.

### Digital Signatures & EDI

- Digital signatures might be time-stamped or digitally notarized to establish dates & times

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- If digital signatures are to replace handwritten signatures, they must have the same legal status as handwritten signatures.
- It provides a means for a third party to verify that notarized object is authentic.

### **EDI & Electronic Commerce**

- New types of EDI are traditional EDI & open EDI

### **Traditional EDI**

- It replaces the paper forms with almost strict one-to-one mappings between parts of a paper form to fields of electronic forms called transaction sets.
- It covers two basic business areas:
  1. Trade data Interchange (TDI) encompasses transactions such as purchase orders, invoice & acknowledgements.
  2. Electronic Funds Transfer (EFT) is the automatic transfer of funds among banks & other organizations
- It is divided into 2 camps: old EDI & new EDI.
- Old EDI is a term created by those working on the next generation of EDI standards in order to differentiate between the present & the future.

### **Old EDI**

- Automating the exchange of information pertinent to business activity
- It is referred as the current EDI-standardization process where it allows every company to choose its own, unique, proprietary version

### **New EDI**

- It is refocusing of the standardization process.
- In this, the structure of the interchanges is determined by the programmer who writes a program.
- It removes long standardization process.

### **Open EDI**

- It is a business procedure that enables e-commerce to occur between organizations where the interaction is of short duration.
- It is process of doing EDI without the upfront trading partner agreement that is currently signed by the trading partners

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- The goal is to sustain ad hoc business or short-term trading relationships using simpler legal codes.
- It is a law of contract within the context of e-commerce where transactions are not repeated over long period of time.

### **Standardization & EDI**

#### **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

#### **Structure of EDI transactions**

- Transaction set is equivalent to a business document, such as a purchase order
- Data Segments are logical groups of data elements that together convey information
- Data elements are individual fields, such as purchase order no.

#### **Comparison of EDIFACT & X.12 Standards**

- These are comprised of strings of data elements called segments.
- A transaction set is a set of segments ordered as specified by the standard.
- ANSI standards require each element to have a very specific name, such as order date or invoice date.
- EDIFACT segments, allow for multiuse elements, such as date.
- EDIFACT has fewer data elements & segments & only one beginning segment (header), but it has more composites.
- It is an ever-evolving platform

#### **EDI Software Implementation**

- EDI software has 4 layers:
  1. Business application
  2. Internal format conversion
  3. EDI Translator

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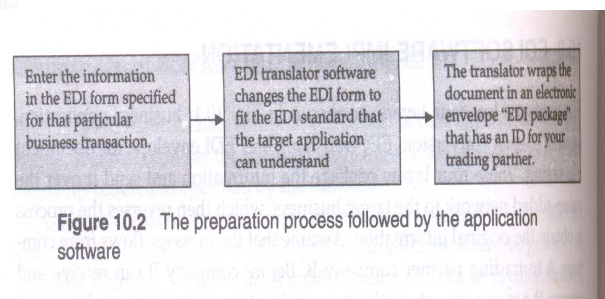
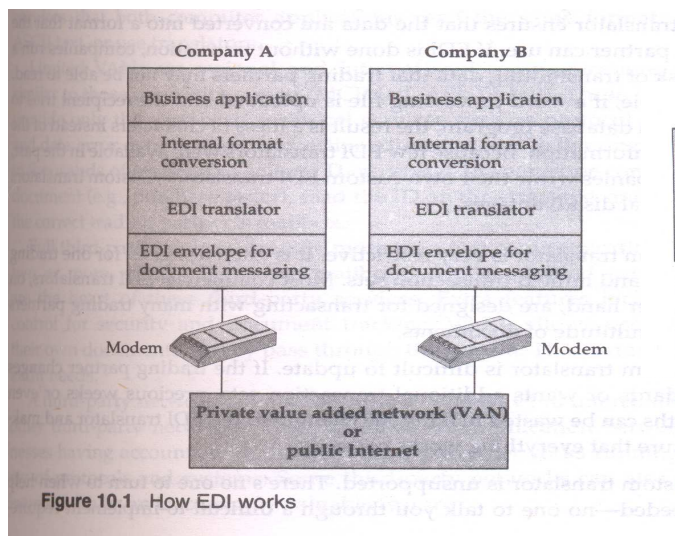
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### 4. EDI envelope for document messaging

- These 4 layers package the information & send it over the value-added network to the target business, which then reverses the process to obtain the original information

### EDI Business Application Layer

1. It creates a document, an invoice.
2. Sends to EDI translator, reformats the invoice into an EDI standard.
3. If there are on the same type of computer, the data move faster



## EDI Envelope for Message Transport

### The X.400 & X.435 Envelopes

- The X.400 standard was meant to be the universal answer to e-mail interconnectivity
- It promises much & to date, delivers little.
- The work on X.400 began in 1980
- It is the open standard for mail interchange
- The standard exists in 3 versions: 1984, 1988, & 1992.

### EDI Software Implementation

- The X.435 inserts a special field in an X.400 envelope to identify an EDI message
- It includes data encryption; integrity; notification of message delivery & nondelivery; & nonrepudiation of delivery

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- It is secure, reliable way to send EDI & accompanying files within the same message.
- Purchase orders, invoices, drawings, e-mail- all could be sent with end-to-end acknowledgment of message receipt.

### Value-Added Networks (VANs)

- A VAN is a communication network that typically exchanges EDI messages among trading partners.
- It provides services, including holding messages in “electronic mailboxes”, interfacing with other VANs
- Disadvantage is EDI-enabling VANs is that they are slow & high-priced, charging by the no. of characters transmitted

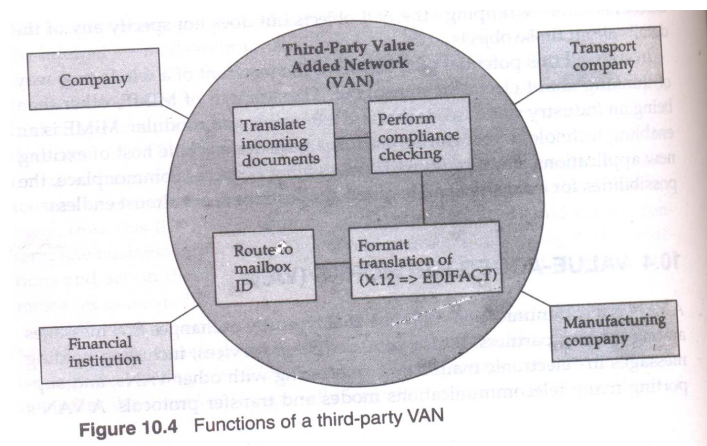


Figure 10.4 Functions of a third-party VAN

### Internet-Based EDI

Several factors make internet useful for EDI:

- Flat-pricing that is not dependent on the amount of information transferred
- Cheap access with low cost of connection- often a flat monthly fee for leased line Or dial-up access
- Common mail standards & proven networking & interoperable systems
- Security--public-key encryption techniques are being incorporated in various electronic mail systems





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- **Information architecture (IA)** is the art of expressing a model or concept of information used in activities that require explicit details of complex systems.
- Among these activities are library systems, content Management Systems, web development, user interactions, data base development, programming, technical writing, enterprise architecture, and critical system software design.

Most definitions have common qualities: a structural design of shared environments, methods of organizing and labelling websites, intranets, and online communities, and ways of bringing the principles of design and architecture to the digital landscape

### What Is Cross-functional Management?

- **Cross-functional management (CFM)** manages business processes across the traditional boundaries of the functional areas.
- CFM relates to coordinating and sneering the activities of different units for realizing the super ordinate cross-functional goals and policy deployment.
- It is concerned with building a better system for achieving for achieving such cross-functional goals as innovation, quality, cost, and delivery.

### MACROFORCES AND INTERNAL COMMERCE

- Macro forces and internal commerce highlights the changes taking place in organization structure and explores how technology and other economic forces are molding arrangements within firms.
- The common focus in most of these modern management particles is the use of technology for improving efficiency and eliminating wasteful tasks in business operations.
- Efficient operations of the macro forces and internal commerce are:
- Total quality management
- Business process improvement or business process reengineering.
- The words improvement and reengineering are often used interchangeably, creating confusion.
- Although the goal of these two are same I.e. productivity gains, cost savings, quality and service improvements, cycle-time reduction.
- One main reason for reengineering is to better complete in global markets.

### Global Markets: Definition and Characteristics

#### Definition:

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- The Oxford University Press defines **global marketing** as “marketing” on a worldwide scale reconciling or taking commercial advantage of global operational differences, similarities and opportunities in order to meet global objectives.”

### **Global marketing:**

- When a company becomes a global marketer, it views the world as one market and creates products that will only require weeks to fit into any regional marketplace. Marketing decisions are made by consulting with marketers in all the countries that will be affected. The goal is to sell the same thing the same way everywhere.

The Four elements of global marketing of marketing:

### **Product:**

- A global company is one that can create a single product and only have to tweak elements for different markets. For example coca-cola uses two formulas (one with sugar, one with corn syrup) for all markets.

### **Price:**

- Price will always vary from market to market. Price is affected by many variables: cost of product development (produced locally or imported), cost of ingredients, cost of delivery (transportation, tariffs, etc.), and much more.

### **Placement:**

- How the product is distributed is also a country-by-country decision influenced by how the competition is being offered to the target market. Using Coca-Cola as an example again, not all cultures use vending machines.

### **Promotion:**

- After product research, development and creation, promotion is generally the largest line item in a global company’s marketing budget. At this stage of a company’s development, integrated marketing is the goal.
- The global corporation seeks to reduce costs, minimize redundancies in personnel and work, maximize speed of implementation, and to speak with one voice.

## **Global marketing Advantages and Disadvantages**

### **Advantages:**

- Economies of scale in production and distribution
- Power and scope
- Consistency in brand image
- Ability to leverage good ideas quickly and efficiently

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- Uniformity of marketing practices
- Helps to establish relationships outside of the "political arena"

### **Disadvantages:**

- Differences in consumer needs, wants, and usage patterns for products
- Differences in consumer response to marketing mix elements.
- Differences in brand and product development and the competitive environment.
- Differences in administrative procedures and Differences in product placement.

### **Marketing Research:**

- It involves the *identification*, collection, analysis, and *dissemination of information*. Each phase of this process is important.
- Finally, the findings, implications and recommendations are provided in a format that allows the information to be used for management decision making and to be acted upon directly.
- It should be emphasized that marketing research is conducted to assist management in decision making and is not: a means or an end in itself.

### **Marketing Research Characteristics:**

- First, marketing *research is systematic*. Thus systematic planning is required at all the stages of the marketing research process.
- The procedures followed at each stage are methodologically sound, well documented, and, as much as possible, planned in advance.
- Marketing research uses the scientific method in that data are collected and analyzed to test prior notions or hypotheses.
- Marketing research is *objective*. It attempts to provide accurate information that reflects a true state of affairs. It should be conducted impartially.
- An **organizational structure** is a mostly hierarchical concept of subordination of entities that collaborate and contribute to serve one common aim.
- Organizations are a number of clustered entities. The structure of an organization is usually set up in one of a variety of styles, dependent on their objectives and ambience.
- *Organizational structure* allows the expressed allocation of responsibilities for different functions and processes to different entities.
- Common success criteria for organizational structures are:

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- Decentralized reporting
- Flat hierarchy
- High transient speed
- High transparency

### **Vertical Organization:**

- Hierarchically structured organization where all management activities are controlled by a centralized management staff.

Vertical organization has two problems:

- First, it creates boundaries that discourage employees in different departments from interacting with one another.
- Second, departmental goals are typically set in a way that could cause friction among departments.
- A **vertical market** is a group of similar businesses and customers which engage in trade based on specific and specialized needs.
- An example of this sort of market is the market for point-of-sale terminals, which are often designed specifically for similar customers and are not available for purchase to the general public.
  
- A vertical market is a market which meets the needs of a particular industry: for example, a piece of equipment used only by semiconductor manufacturers. It is also known as a niche market.
- Vertical market software is software aimed at addressing the needs of any given business within a discernible vertical market.

### **Horizontal organization:**

- A **horizontal market** is a market which meets a given need of a wide variety of industries, rather than a specific one.

### **Examples**

- In technology, horizontal markets consist of customers that share a common need that exists in many or all industries.
- For example, customers that need to purchase computer security services or software exist in such varied industries as finance, healthcare, government, etc.
- Horizontal marketing participants often attempt to meet enough of the different needs of vertical markets to gain a presence in the vertical market.

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- An example could be software that manages services in hotels - amenities solutions.

### **Vertical organization Comparison with horizontal organization:**

- A vertical market is a market which meets the needs of a particular industry: for example, a piece of equipment used only by semiconductor manufacturers.
- A horizontal market is a market which meets a given need of a wide variety of industries, rather than a specific one: for example, word processing software.

### **New forms of organizational structure:**

Two new forms of organizational structures are:

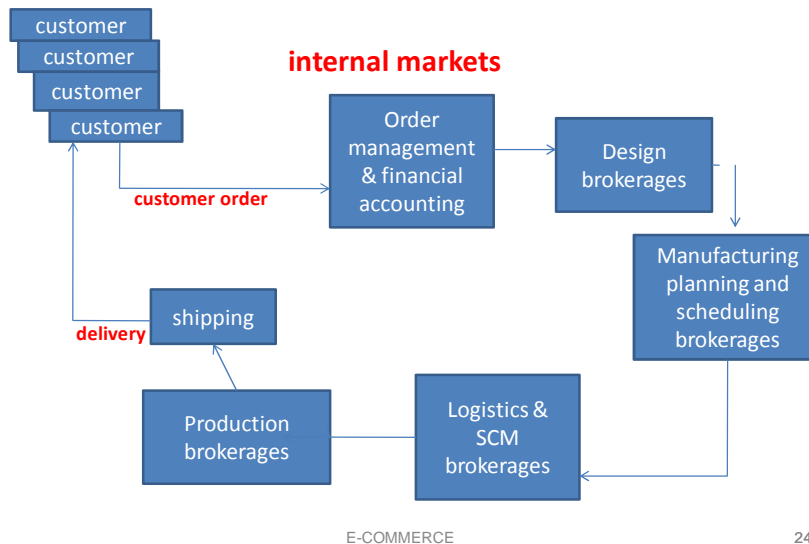
#### **Prominent-virtual organizational structure:**

- In recent years, virtual enterprises have gained much attention as more and more firms from computer chip manufacturing to aircraft manufacturing.
- Virtual organization is defined as being closely coupled upstream with its suppliers and downstream with its customers.
- Virtual organization has been variously referred to as network organizations, organic networks, hybrid networks and value-adding partnership.

#### **Brokerages organizational structure:**

- The main goal of electronic brokerages organization is to increase the efficiency of the internal marketplace.
- Internal markets are beginning to appear not only in corporations but even in non business institutions like the government.
- They are created inside organizations, allowing firms, suppliers, government agencies to meet the new challenges of the fast-changing environment.

## Types of electronic brokerages in internal markets:



## WORK FLOW AUTOMATION AND COORDINATION

- In last decade, a vision of speeding up or automating routine business tasks has come to be known as “work-flow automation.
- This vision has its root in the invention of the assembly line and the application of Taylor's scientific management principles.
- Today, a similar trend is emerging in the automation of knowledge-based business processes called work-flow automation.
- The goal of work-flow automation is to offer more timely, cost-effective, and integrated ways to make decisions.
- Typically, work-flows are decomposed into steps or tasks, which are task oriented.
- Work-flows can be simple or complex.
- Simple work-flows typically involve one or two steps or tasks.
- Another way of looking at work-flow is to determine the amount of cross-functional activity.
- In other words, companies must adopt an integrated process view of all the business elements
- Organizational integration is extremely complex and typically involves three steps
- Improving existing processes by utilizing technology where appropriate.

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- Integrate across the business function offer identifying the information needs for each process.
- Integrating business functions, application program interface, and database across departments and groups.
- Complex work-flows involve several other work-flows, some of which Executes simultaneously.

### **Work-Flow Coordination:**

- The key element of market-driven business is the coordination of tasks and other resources throughout the company to create value for customer.
- To this end, effective companies have developed horizontal structures around small multifunctional teams that can move more quickly and easily than businesses that use the traditional function-by-function, sequential approach.
- Some of the simplest work-flow coordination tools are electronic forms routing applications such as lotus notes.
- As the number of parties in the work flow increases, good coordination becomes crucial.

### **Work-flow related technologies:**

- Technology must be the “engine” for driving the initiatives to streamline and transform business interactions.
- Large organizations are realizing that they have a middle-management offer all the drawn sizing and reorganization of fast few years.
- Pressures for more comprehensive work-flow systems are building rapidly.
- Work-flow system are limited to factory like work process.

### **Middleware is maturing:**

- By this users or third-party providers need to learn how to develop work-flow applications within middleware environment.

### **Organizational memory is becoming practical:**

- The new tools for memory becoming advancing towards what can be called the “corporate digital library”.

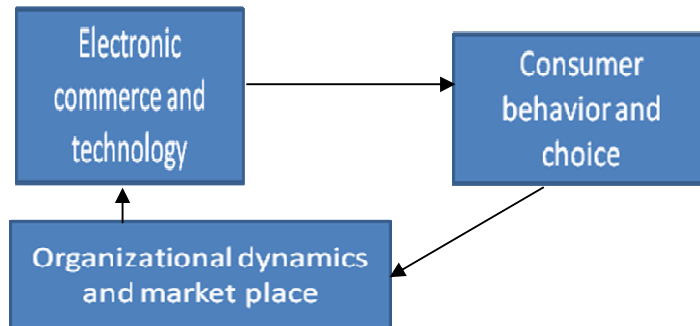
## **CUSTOMIZATION AND INTERNAL COMMERCE**

- Technology is transforming consumer choices, which in turn transform the dynamics of the marketplace and organizations themselves.
- Technology embodies adaptability, programmability, flexibility, and other qualities so essential for customization.

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- Customization is explained as :



- **Mass customization**, in marketing, manufacturing, and management, is the use of flexible computer-aided manufacturing systems to produce custom output.
- Those systems combine the low unit costs of mass production processes with the flexibility of individual customization
- "Mass Customization" is the new frontier in business competition for both manufacturing and service industries.

### Implementation:

- Many implementations of mass customization are operational today, such as software-based product configurations which make it possible to add and/or change functionalities of a core product or to build fully custom enclosures from scratch.
- Companies which have succeeded with mass-customization business models tend to supply purely electronic products.
- However, these are not true "mass customizers" in the original sense, since they do not offer an alternative to mass production of material goods.

### Four types of mass customization:

- **Collaborative customization** - Firms talk to individual customers to determine the precise product offering that best serves the customer's needs.
- **Adaptive customization** - Firms produce a standardized product, but this product is customizable in the hands of the end-user.
- **Transparent customization** - Firms provide individual customers with unique products, without explicitly telling them that the products are customized.



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- **Cosmetic customization** - Firms produce a standardized physical product, but market it to different customers in unique ways.
- Most of the written materials and thinking about customization has neglected technology.
- It has been about management and design of work processes.
- Today technology is so pervasive that it is virtually impossible to make clear distributions among management, design of work, and technology in almost all forms of business and industry.
- Technology has moved into products, the workplace, and the market with astonishing speed and thoroughness.
- Mass customization, not mass production.
- Today the walls that separated functions in manufacturing and service industries alike are beginning to fall like dominoes.
- Customization need not be used only in the production of cars, planes, and other traditional products.
- It can also be used for textiles and clothing.
- Technology is also enabling new forms of customized production in apparel industry.

### What is Supply chain?

- Consists of all parties involved, directly or indirectly in fulfilling a customer request.



### SUPPLY CHAIN MANAGEMENT (SCM)

- **Supply chain management (SCM)** is the management of a network of interconnected business involved in the ultimate provision of product and service packages required by end customers.
- Supply Chain Management spans all movement and storage of raw materials, work-in-process inventory, and finished goods from point-of-origin to point-of-consumption.
- Supply Chain Management can also refer to supply chain management software which is tools or modules used in executing supply chain transactions, managing supplier relationships and controlling associated business processes.

### The Management Components of SCM

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- The literature on business process re-engineering, buyer-supplier relationships, and SCM suggests various possible components that must receive managerial attention when managing supply relationships.
- Lambert and Cooper (2000) identified the following components which are:
  - Planning and control
  - Work structure
  - Organization structure
  - Product flow facility structure
  - Information flow facility structure
  - Management methods
  
- Power and leadership structure
- Risk and reward structure
- Culture and attitude
- **Reverse Supply Chain** Reverse logistics is the process of planning, implementing and controlling the efficient, effective inbound flow and storage of secondary goods and related information opposite to the traditional supply chain direction for the purpose of recovering

## Unit-VI

### THE CORPORATE DIGITAL LIBRARY

- DIMENSIONS OF THE INTERNAL ELECTRONIC COMMERCE SYSTEM
- MARKETING A BUSINESS CASE FOR A DOCUMENT LIBRARY
- TYPES OF DIGITAL DOCUMENTS
- ISSUES BEHIND DOCUMENT INFRASTRUCTURE
- CORPORATE DATA WAREHOUSES

### DIMENSIONS OF THE INTERNAL ELECTRONIC COMMERCE SYSTEM

These are the following dimensions for internal electronic commerce organization:

#### User modeling and interaction:

- User models are interposing between the user interface and information sources to filter the available information according to the needs of the task and user.
- It associates with each task or each person is a user agent or set of user agents.
- Tasks of user agents are:
  - Maintaining of model & current state of the task
  - Determining of information for each step of the task
  - Appropriate combining of information with user.
- Addressing the issue of displaying information to the user.
- Considering of wide range of display devices.
- Determining the most appropriate methods for display.
- In this user agent tackle two issues:
  1. Generation of documents
  2. Presentation of documents.

#### Effective utilization of information

- Organization decision making cannot be supported with a single tool, a set technology tools are required for effective utilization of information.
- Organization needs online –transactions for design, production, logistics and profitability.

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### **Types of On-line transaction:**

- Two types of on-line transaction are :
  1. On-line transaction processing (OLTP).
  2. On-line analytical processing (OLAP).
- OLTP involves the detailed, day-to-day procedures such as order entry & order management.
- OLAP refers to the activity involved in searching the wealth of data residing throughout an enterprise for trends, opportunities.

### **Navigating the info sphere**

- It involves two related activities:
  - Information search, discovery and retrieval.
  - Presentation of retrieved Information.

### **Search, Discovery and Retrieval:**

- This view is changing in three ways.
  1. Characterization of accessible information
  2. Search concepts from this information.
  3. Development of information filter

### **Presentation or visualization:**

- It is used for easy understanding of information.
- Organization must predefine rules for visualization.
- This process will highlight the trouble spots and area of opportunities.
- Presentation increases the following tasks of information :
  1. Accessing ability of information.
  2. Collecting of information.
  3. Queue of information.
  4. Organizing of information.

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## Digital Library Layer

- Many organizations manage their information through corporate library, if it provide the architecture to model, map, integrate & information in digital documents is called digital library.
- It provides information structures by this organizations & workers access vast amount of data encoded in multimedia formats.
- Digital libraries are of two types:
  1. Electronic document-based digital libraries.
  2. Data-base oriented warehouses.

## Document digital library:

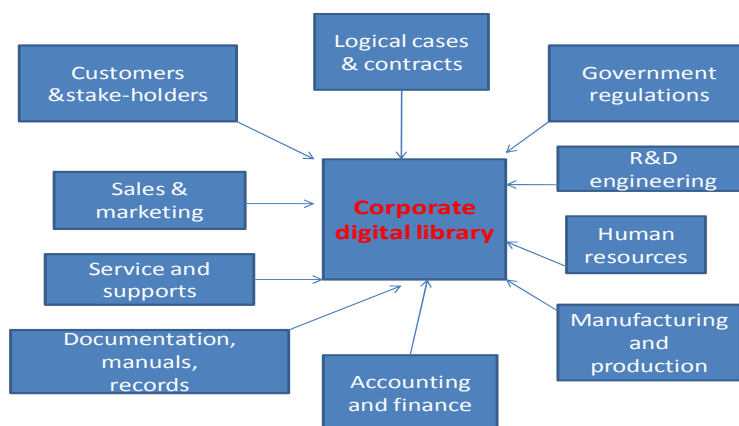
- The term document is used to denote all non data records I.e. books, reports, e-files, videos and audios.
- Digital library is simply a distributed network of interlinked information.

## Data warehouses:

- It is a central repository for combining and storing vast amount of data from diff sources.
- Sources are main frame database, lint-server database, text reports....etc.

## MAKING A BUSINESS CASE FOR DOCUMENT LIBRARY

- This section highlights the role that documents play in today's organization and how business can better meet their customers' needs by improving document management support.



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## Digital Document Management Issues and Concerns

- **Ad hoc documents:** Letters, finance reports, manuals are called ad hoc documents, which are prepared by managers & professionals.
- **Process-specific documents:** invoices and purchase orders which are created, constructed and distributed by support personnel. these are form based.
- **Knowledge-oriented documents:** these are technical documents, catalogs of product information, and design documents.

## Types of Digital Documents

Four types of digital documents are:

- Structuring applications around a document interface
- Structuring interlinked textual & multimedia Documents.
- Structuring and encoding information using document-encoding standards
- Scanning documents for storage and faxing.

## Document Imaging

- Document imaging emulates microfiche and microfilm.
- An imaging system passes appear document through a scanner that renders it digital and then stores the digital data as a bit-mapped image of document.
- The problem with the imaging approach is that the output contains only images not text.

The following imaging standards are prominently used:

- **TIFF** (tag image file format): format for interchange of bit-mapped images.
- **ITU-TSS** (international telecommunication union-telecommunication standardization sector) Group IV T.6 facsimile: this standard is used for compression and exchange of bit-mapped files.

## Structured Documents

- A structured document provides clear description of document content.
- Structured documents apply data-base structuring capabilities to individual documents and document collections.

Standard for structured documents are:

**SGML** (Standard Generalization Markup Language):

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- It is an ISO standard for interchange & multi formatting description of text document in terms of logical structure.

### **ODA** (Office Document Architecture):

- It is an ANSI & ISO standard for interchange of compound office documents.ODA specifies both content & format.

### **CDA** (Compound Document Architecture):

- It defines set of rules for content and format .It defines services for compound documents.

### **RTF** (Rich –Text Format):

- It is developed by Microsoft for interchanging of desk top documents.

### **Hyper Text Documents**

- Hyper text is a way of making document-based information more mobile.

### Reasons for mobility of information are:

- Information in enterprises is seldom located on server but is distributed throughout the organization.
- Accessing & retrieving large monolithic document is time consuming.
- Reuse of document for composing new documents is difficult task.
- In this relationships between documents can be represented through hypermedia links i.e. hyperlinks.

### **Standards of Hypermedia:**

- HyTime: it adds time based relationships like synchronization, it is extension of SGML.
- HTML: developed by WWW to support distributed hypermedia.
- MHEG(multimedia /hypermedia encoding/exporting Group):standard for presenting objects in multimedia

### **Active documents**

- Active document represents what is known as document oriented computing.
- Active document provide an interactive interface between documents.
- Active documents are especially powerful because they combine composition of information with the distributed nature of information.
- Ex: spreadsheet, word-processing..etc

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## Issues behind Document Infrastructure

Document infrastructure addressed these questions:

- What is the proper architecture for the corporate digital library?
- What are appropriate model?
- What protocols required?
- What are the best human interfaces?
- How does one represent and manipulate the information processing activities occurred in the digital library?

## Document Constituencies:

- The emerging document processing & management strategies must address these constituencies.
- They need system to access distributed repositories& to manipulate them in a number of ways.

## Document-oriented processes

Components of Document-oriented processes are:

- Document creation
- Document media conversation(it accept multiple forms of input)
- Document production and distribution
- Document storage and retrieval

## Document-based framework flows:

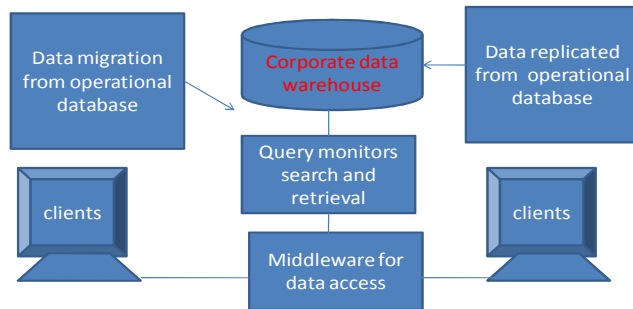
The following Four activities make up the document-based framework flow:

- **Document modeling:** it defines the structure and processes the document.
- **Transformation:** creates modules for capturing and validating.
- **Synthesizing:** create value-added information from the combination of two or more documents.
- **Business modeling:** defines the structure and processes of the business environment.



## Corporate Data Warehouses

- Architecture of the data warehouse is as follows:



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- Data warehouse is used store information of the organization.
- Data warehouse is needed as enterprise wide to increase data in volume and complexity.

### Characteristics of data warehouse are:

- An information-based approach to decision making.
- Involvement in highly competitive & rapidly changing markets.
- Data stored in many systems and represented differently.

### Functions performed by data warehouse are:

- Allow existing transactions and legacy systems to continue in operation.
- Consolidates data from various transaction systems into a coherent set.
- Allows analysis of virtual information about current operations of decision support.

### Types of data warehouses

There are four types of data warehouses:

**Physical data warehouse:** It gathers corporate data along with the schemas and the processing logics.

**Logical data warehouse:** It contains all the Meta data and business rules.

**Data library:** This is sub set of the enterprise wide data warehouse.

**Decision support system (DSS):** These are the applications but make use of data warehouse

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## **Managing data**

### **To manage data following steps are needed:**

- Translation
- Summarizing
- Packaging
- Distributing
- Garbage collection

### **Advantages of data warehouse:**

- Timely and accurate information become an integral part of the decision-making process.
- User can manage and access large volumes of in one cohesive framework.
- Data warehousing has wide spread applicability.
- It provides point-of-sales reports instead of end-of –day reports.

## **Advertising and Marketing on the Internet**

- The new age of information-based marketing.
- Advertising on the internet.
- Marketing research.

## **The New Age of Information-Based Marketing**

The new age of information-based marketing differentiate interactive marketing into four areas:

- Retailers vs manufacturers
- Target and micromarketing
- Small business vs large business
- Regulatory and legal implications of cyberspace marketing.

### **Retailers' vs Manufacturers:**

- The role of Retailers and manufacturers are fast reversing in electronic commerce.

### **Retailer's vs Manufacturers have the fallowing methods:**

- Market research and customer prospecting.

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- Market presence method
- Product or services building method
- Information-based products pricing and priority method.

### **Target and Micromarketing:**

- Electronic commerce, technology has put target and micromarketing within the research of small business.
- It gives information to the micro marketers not only about its own business but also consumer's information.
- Consumer target is two-way flow of communication between seller and buyer.
- Direct mail and telemarketing are two fast growing ways to micro market.
- Technology is an essential tool in micromarketing.

### **There are two main types of micromarketing:**

- Direct-relationship micromarketing: is aimed at stimulating sales at retail establishments through direct contacts with consumers.
- Direct-order micromarketing: is focused on selling products directly to consumers in their homes or businesses.

### **Small vs large: Thread avoid vs goliath syndrome**

- The key distinction between small and large business remains access to national and international marketing for advertising purposes.
- Today, exorbitant advertising cost represents the barrier to reaching the customer effectively. Internet and other networks plays good role in advertising.
- The major difference between the internet and other I-way advertising media are ownership and membership fees.
- Due to the empowering effect of internet-facilitated advertising however, the balance of power between large and small companies may change in future.

### **Advertising on the Internet**

- The notion of advertising and marketing became inevitable after 1991 when the internet was opened for commercial traffic.
- There are very good reasons for embracing the inevitability of growing of commercial advertising on the internet:
  - Advertising conveys much needed information

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- Advertising generates significant revenue

### **Key components for making internet advertising effectively are:**

- Advertising process
- Core content
- Supporting content
- Market and consumer research
- Repeat customers

### **On-line advertising paradigms:**

- Two different advertising paradigms are emerging in the on-line world, they are:
  1. Active or push-based advertising
  2. Passive or pull-based advertising

### **Active or push-based advertising:**

Active or push-based advertising is of two types they are :

The broadcast model:

- Broadcasting message provides a means for reaching a great number of people in short period of time.
- It mimics the traditional model, in which customer is exposed to the advertisement during TV programming.
- It basically uses direct mail, spot television, cable television.
- Text-based broadcast messages also used in advertising in Usenet news groups.

The junk mail model:

- Disadvantage of the direct mail include relatively high cost per contact.
- Junk mail is the just poorly targeted direct mail.
- It is most intrusive of all forms of internet advertising, because it is easily implemented using electronic mail.
- Junk mail creates unwanted expense as well as an annoyance.

### **Passive or pull-based advertising**

Pull-based advertising provide a feedback loop, company and customers.

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On-line pull-based advertising includes the following:

- Billboards
- Catalogs or yellow pages directories:
- endorsements

Based on the above three we have the following models:

### **The billboards or www model:**

- Billboard advertising is often used to remind the customer of the advertising messages communicated through other media.
- The advantage of this model is no customer charges.
- In this message must be simple, direct.

### **Catalog and yellow pages directory model:**

- Traditionally, the most visible directory service of advertising is the yellow pages.
- Catalog model is the least intrusive model but requires active search on the part of customer.
- Yellow pages are low in cost in terms of production and placement.
- Disadvantage of yellow page include lack of timeliness and little creative flexibility.

### **Customer endorsement model:**

- In endorsements people tell their experiences with products and services.
- These are in question and answer format.

### **Marketing Research**

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

Broadly marketing research is divided into three faces:

- Data collection
- Data organization
- Data analysis and sense making

### **Data collection:**

- Markets mainly relied on source database for understanding consumer behavior.

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- Source data base mainly comprise of numeric information.
- Delivery of source database services follows two main patterns.
- Data collect and collate data, making it available by data base producers.
- Data collect and collate data, making it available by central hosts like CompuServe, American online..etc.

### **Data organization:**

- Everyone is collecting data from electronic commerce, but very few are organizing it effectively for developing a marketing strategy.

The key abilities in their environment are:

- Leverage its established database into customized offerings by audience and markets.
- Leverage its established database in terms of horizontal growth.

### **Data analysis and sense making:**

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

## Unit-VII

### SEARCH AND RESOURCE DISCOVERY PARADIGMS

Three information search and resource discovery paradigms are in use:

- Information search and retrieval
- Electronic directories & catalogs.
- Information filtering.

#### **Information search and retrieval:**

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

#### **Electronic catalogs and directories:**

- Information organizing and browsing is accomplished using directories or catalogs'
- Organizing refers to how to interrelate information, by placing it in some hierarchy.
- Maintaining large amount of data is difficult.

#### **Information filtering:**

- Goal of information filtering if selecting of data that is relevant, manageable and understandable.
- Filters are of two types
  1. Local filter
  2. Remote filter
- Local filters: local filters work on incoming data to a PC, such as news feeds.
- Remote filters: remote filters are often software agents that work on behalf of the user and roam around the network from one data base to another.

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## CONSUMER SEARCH AND RETRIVAL

- SEARCH AND RESOURCE DISCOVERY PARADIGMS
- INFORMATION SEARCH AND RETRIEVAL
- ELECTRONIC COMMERCE CATALOGS OR DIRECTORIES
- INFORMATION FILTERING

## INFORMATION SEARCH AND RETRIEVAL

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

**The end-user retrieval phases:** consists of three steps

- First is, the user formulates a text based query to search data.
- Second is, the server interprets users query, performs the search and returns the user a list of documents.
- Third is, the user selects documents from the hit list and browses them, reading and perhaps printing selected portions of retrieved data.

**The publisher indexing phase:**

- It consists of entering documents in to the system and creating indexes and pointers to facilitate subsequent searches.
- The process of loading a document and updating indexes is normally not a concern to the user.
- These two phases are highly interdependent

**WAIS (Wide Area Information Service):**

- It enables users to search the content of the files for any string of text that they supply.

WAIS has three elements:

- Client
- Sever
- Indexer



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

### **Search Engines:**

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

### **Indexing methods:**

- To accomplish accuracy and conserve disk space, two types of indexing methods are used by search engines.

They are:

1. File-level indexing
2. Word-level indexing

### **File-level indexing:**

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

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### Word-level indexing:

- It is more sophisticated and stores the location of each instance of the word.
- The disadvantage of the word-level indexing is that all the extra information they contain gobbles up a lot of disk space, it is 35-100 percent of the original data.
- The process of indexing data is simple one ,it has large number of indexing packages:
- These indexing packages are categorized into three types, they are:
  1. The client-server approach
  2. The mainframe-based approach
  3. The parallel-processing approach

### Search and new data types:

We have the following search technologies for effective search:

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

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

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

**3D-images:** virtual reality displays offer a 3D environment in which all portions of the user interface are 3D.

Searching using these new types of information poses interesting challenges that need to be addressed soon.

- Www Robots, wanderer, and Spiders
- Robots, Wanderer, And Spiders are all programs that traverse the www automatically gathering information.

### ELECTRONIC COMMERCE CATALOGS OR DIRECTORIES

- A directory performs an essential support function that guides customers in a maze of options by enabling the organizations of the information space.

Directories are of two types:

1. The white pages
2. Yellow pages

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- The white pages are used to people or institutions and yellow pages are used to consumers and organizations.

### **Electronic white pages:**

- Analogues to the telephone white pages, the electronic white pages provide services from a static listing of e-mail addresses to directory assistance.
- White pages directories, also found within organizations, are integral to work efficiency.
- The problems facing organizations are similar to the problems facing individuals.
- A **white pages schema** is a data model, specifically a logical schema, for organizing the data contained in entries in a directory service, database, or application, such as an address book.
- A white pages schema typically defines, for each real-world object being represented:
  - What attributes of that object are to be represented in the entry for that object.
  - What relationships of that object to other objects are to be represented?
- One of the earliest attempts to standardize a white pages schema for electronic mail use was in X.520 and X.521, part of the X.500 a specification that was derived from the addressing requirements of X.400.
- In a white pages directory, each entry typically represents an individual person that makes the use of network resources, such as by receiving email or having an account to log into a system.
  - In some environments, the schema may also include the representation of organizational divisions, roles, groups, and devices.
- The term is derived from the white pages, the listing of individuals in a telephone directory, typically sorted by the individual's home location (e.g. city) and then by their name.

### **White pages through x.500:**

- One of the first goal of the X.500 project has been to create a directory for keeping track of individual electronic mail address on the internet.
- X.500 offers the following features:
  - Decentralized maintenance
  - Each site running x.500 is responsible only for its local part of the directory.

**Searching capabilities:** x.500 provides powerful searching capabilities i.e. in the white pages; you can search solely for users in one country. From there you can view a list of organizations, then departments, then individual names.

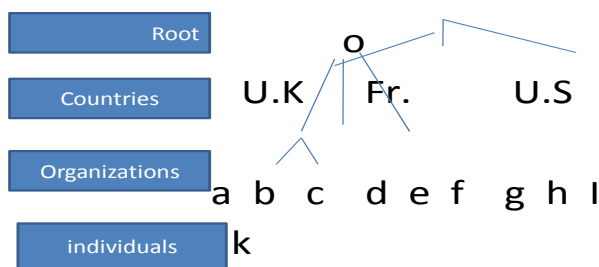
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This represents the tree structure.

- **Single global name space:** x.500 provides single name space to users.
- **Structured information framework:** X.500 defines the information framework used in the directory, allowing local extensions.
- **Standards-based directory:** X.500 can be used to build directory applications that requires distributed information.

## Lecture 4



## WHITE PAGES DIRECTORY INFORMATION TREE

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## ELECTRONIC YELLOW PAGES:

- The term *Yellow Pages* refers to a telephone directory of businesses, categorized according to the product or service provided.
- The traditional term *Yellow Pages* is now also applied to online directories of businesses.
- To avoid the increasing cost of yellow paper, the yellow background of the pages is currently printed on white paper using ink. Yellow paper is no longer used.
- The name and concept of "Yellow Pages" came about in 1883, when a printer in Cheyenne, Wyoming working on a regular telephone directory ran out of white paper and used yellow paper instead.
- In 1886 Reuben H. Donnelley created the first official yellow pages directory, inventing an industry.
- Today, the expression *Yellow Pages* is used globally, in both English-speaking and non-English speaking countries.
- In the US, it refers to the category, while in some other countries it is a registered name and therefore a proper noun.

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- **Third-party directories can be categorized variously:**
- **Basic yellow pages:** These are organized by human-oriented products and services.
- **Business directories:** This takes the extended information about companies, financial-health, and news clippings.
- **State business directories:** this type of directory is useful in businesses that operate on a state or geographic basis.
- **Directories by SIC** :( standard industrial classification) directories are compiled by the government.
- **Manufacturer's directories:** if your goal is to sell your product or service to manufacturers, then this type of directory is used.
- **Big-business directory:** This directory lists companies of 100 or more employees.
- **Metropolitan area business directory:** It develops sales and marketing tools for specific cities.
- **Credit reference directory:** this directory provides credit rating codes for millions of US companies.
- **World Wide Web directory:** this **lists** the various hyperlinks of the various servers scattered around the internet.

### INFORMATION FILTERING

- An **Information filtering system** is a system that removes redundant or unwanted information from an information stream using (semi)automated or computerized methods prior to presentation to a human user.
- Its main goal is the management of the information overload and increment of the semantic signal-to-noise ratio. To do this the user's profile is compared to some reference characteristics.
- A notable application can be found in the field of email spam filters.
- Thus, it is not only the information explosion that necessitates some form of filters, but also inadvertently or maliciously introduced pseudo-information.
- On the presentation level, information filtering takes the form of user-preferences-based newsfeeds, etc.
- Recommender systems are active information filtering systems that attempt to present to the user information items (movies, music, books, news, webpage) the user is interested in.
- Information filtering describes a variety of processes involving the delivery of information to people who need it.

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- This technology is needed as the rapid accumulation of information in electronic databases.
- Information filtering is needed in e-mails, multimedia distributed system and electronic office documents.

The features of the information filtering are:

- Filtering systems involves large amounts of data (gigabits of text).
- Filtering typically involves streams of incoming data, either being broadcast by remote sources or sent directly by other sources like e-mails.
- Filtering has also been used to describe the process of accessing and retrieving information from remote database.
- Filtering is based on descriptions of individual or group information preferences, often called profiles.
- Filtering system deal primarily with textual information.

### **Email filtering:**

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

### **Mail-filtering agents:**

- Users of mailing-filtering agents can instruct them to watch for items of interest in e-mail in-boxes, on-line news services, electronic discussion forums, and the like.
- The mail agent will pull the relevant information and put it in the users personalized newspapers at predetermined intervals.

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- Example of Apple's Apple Search software. Mail filters can be installed by the user, either as separate programs (see links below), or as part of their e-mail program (*e-mail client*).
- In e-mail programs, users can make personal, "manual" filters that then automatically filter mail according to the chosen criteria.
- Most e-mail programs now also have an automatic spam filtering function.
- Internet service providers can also install mail filters in their mail transfer agents as a service to all of their customers. Corporations often use them to protect their employees and their information technology assets.

### **News-filtering agents:**

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

## Unit-VIII

### MULTIMEDIA AND DIGITAL VIDEO

- KEY MULTIMEDIA CONCEPTS
- DIGITAL VIDEO AND ELECTRONIC COMMERCE
- DESKTOP VIDEO PROCESSING
- DESKTOP VIDEO CONFERENCING

### KEY MULTIMEDIA CONCEPTS

**Multimedia:** the use of digital data in more than one format, such as the combination of text, audio and image data in a computer file.

The theory behind multimedia is digitizing traditional media like words, sounds, motion and mixing them together with elements of database.

### Multimedia data compression:

Data compression attempts to pack as much information as possible into a given amount of storage. The range of compression is 2:1 to 200:1.

### Compression Methods:

- **Sector-oriented disk compression** (integrated into the operating system, this compression is invisible to end user)
- **Backup or archive-oriented compression**(Compress file before they are downloaded over telephone lines)
- **Graphic & video-oriented compression**(Compress graphics & video file before they are downloaded)
- **Compression of data being transmitted over low-speed network**(tech used in modems, routers)

### Data compression in action:

- Data compression works by eliminating redundancy.
- In general a block of text data containing 1000 bits may have an underlying information content of 100 bits, remaining is the white space.
- The goal of compression is to make the size of the 1000-bit to 100-bit (size of underlying information).this is also applicable to audio and video files also.

### Compression Techniques:

- Compression techniques can be divided into two major categories:



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## Lossy:

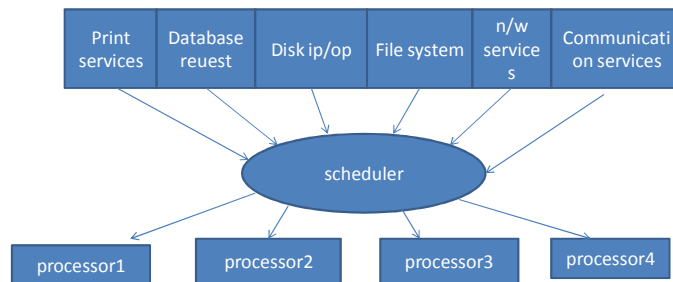
- Lossy compression means that it given a set of data will undergo a loss of accuracy or resolution after a cycle of compression and decompression. it is mainly used for voice, audio and video data.
- The two popular standards for lossy tech is MPEG, JPEG.

## Lossless:

- Lossless compression produces compressed output that is same as the input. It is mainly used for text and numerical data.

Lecture 1

## Symmetric Multiprocessing



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## Multimedia Server:

- A server is h/w & s/w systems that turns raw data into usable information and provide that to users when they needed.
- E-commerce application will require a server to manage application tasks, storage, security, transaction management and scalability.

To manage multimedia information we need the following.

## Multiprocessing:

- Current execution of several tasks on multiple processors. this implies that the ability to use more than one CPU for executing programs. processors can be tightly or loosely coupled.

## Symmetric multiprocessing:

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- Symmetric multiprocessing treats all processors as equal I.e. any processor can do the work of any other processor. It dynamically assigns work to any processor.

### Multitasking:

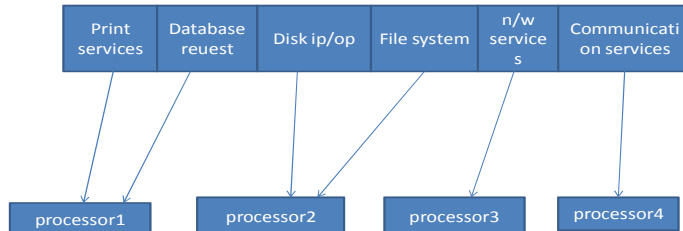
- Multitasking means that the server operating systems can run multiple programs and give the illustration that they are running simultaneously by switching control between them.
- Two types of multitasking are:
  1. Preemptive
  2. Non preemptive

### Multithreading:

- Multithreading is a sophisticated form of multitasking and refer to the ability to support separate paths of execution within a single address space.
- In this a process broken into independent executable tasks called threads

Lecture 1

### Asymmetric Multiprocessing



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### Multimedia Storage Technology

- Storage technology is becoming a key player in electronic commerce because the storage requirements of modern-day information are enormous.
- Storage technology can be divided into two types:
  1. Network-based (disk arrays)
  2. Desktop-based (CD-ROM)

### Disk arrays:

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- Disk arrays store enormous amounts of information and are becoming an important storage technologies for firewall servers and large servers.
- Range provided for small arrays is 5-10 gigabytes.
- Range provided for large arrays is 50-500 gigabytes
- Technology behind disk array is RAID(redundant array of inexpensive disk)
- RAID offers a high degree of data capacity, availability, and redundancy.
- Current RAIDs use multiple 5 1/2 –inch disks.

### CD-ROM:

- CD-ROM is premiere desktop stop storage.
- It is a read only memory, to read CD-ROM a special drive CD-ROM drive is required.
- The main advantage is the incredible storage density.
- That allows a single cd-rom disc contains 530MB for audio CD.
- That allows a single cd-rom disc contains 4.8 GB for video CD.

### CD-ROM Technology Exhibits The Following:

#### High information density:

- It is with optical encoding, the CD can contain some 600-800 MB of data.

#### Low unit cost:

- Unit cost in large quantities is less than two dollars, because CDs are manufactured by well-developed process.

#### Read only memory:

- CD-ROM is read only memory so it cannot be written or erased.

#### Modest random access performance:

- Performance of the CDs is better than floppies because of optical encoding methods.

### The Process of CD proceeds as follows:

- CD-ROM spiral surface contains shallow depressions called **pits**. These pits used to scatter light.
- CD-ROM spiral surface contains spaces between indentations called **lands** .these lands are used to reflect light.
- The laser projects a beam of light, which is focused by the focusing coils.

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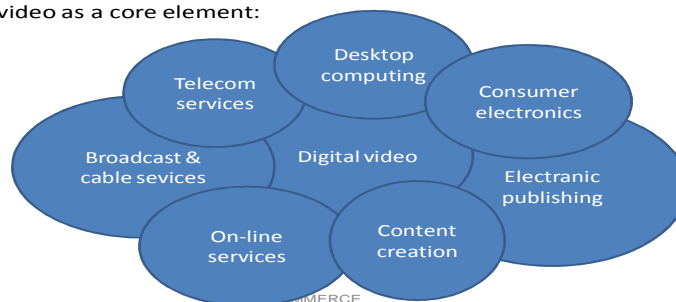
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- The laser beam penetrates a protective layer of plastic & strikes the reflective aluminum layer on the surfaces
- Light striking a land reflects back to the detector.
- Light pulses are translated into small electrical voltage to generate 0's & 1's.

### Lecture 3

#### DIGITAL VIDEO AND ELECTRONIC COMMERCE

- Digital video is binary data that represents a sequence of frames, each representing one image.
- The frames must be shown at about 30 updates per sec.
- Digital video as a core element:



#### Characteristics of Digital Video:

Several Characteristics of digital video differentiate it from traditional analog video.

- It can be manipulated, transmitted and reproduced with no discernible image generation.
- It allows more flexible routing packet switching technology.
- Development of digital video compression technology has enabled the of new applications in consumer electronics, multimedia computers and communications market.
- It poses interesting technical challenges; they are constant rate and continuous time media instead of text, image, audio and video.
- Compression rate are 10 mb /min of video.

#### Digital video compression/decompression:

- Digital video compression takes the advantage of the fact that a substantial amount of redundancies exist in video. The hour-longer video that would require 100 CDs would only required one CD if video is compressed.
- The process of compression & decompression is commonly referred to as just compression, but it involves both processes.
- Decompression is inextensible because once compressed, a digital video can be stored and decompressed many time.

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- The adaptations of international standards are called codec.
- Mostly used codec today's are loss compression.

### **Types of Codec's:**

- Most codec schemes can be categorized into two types:
  1. Hybrid
  2. Software-based.

Hybrid: hybrid codec use combination of dedicated processors and software. It requires specialised add-on hardware.

Best examples of hybrid codec are

- MPEG (moving picture expert group)
- JPEG(joint photographic expert group)

### **MPEG (moving picture expert group):**

- Moving Picture Expert Group is an ISO group; the purpose of this is to generate high quality compression of digital videos.

### **MPEG I (Moving Picture Expert Group I):**

- MPEG I defines a bit steam for compressed video and audio optimized to a bandwidth of 1.5 Mbps, it is the data rate of audio CDs & DATs.
- The standard consists of three parts audio, video, and systems. A system allows the synchronization of video & audio.
- MPEG I implemented in commercial chips .resolution of the frames in MPEG I is 352X240 pixels at 30 frames per second.
- The video compression ratio for this is 26:1

### **MPEG II (Moving Picture Expert Group II):**

- MPEG II specifies compression signals for broadcast-quality video. It defines a bit steam for high-quality “entertainment-level” digital video.
- MPEG-2 supports transmission range of about 2-15 Mbps over cable, satellite and other transmission channels.
- The standard consists of three parts audio, video, and systems. A system allows the synchronization of video & audio.
- MPEG II implemented in commercial chips.

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- Resolution of the frames in MPEG I is 720X480 pixels at 60 frames per second.
- A data rate of the MPEG-2 is 4 to 8 Mbps.
- Future promising of this is rapid evolution of cable TV's news channels.
- Two other MPEG standards are
  - MPEG-3(1920X1080 and data rates are 20 to 40)
  - MPEG-4(consisting of speech and video synthesis)

### **JPEG (Joint Photographic Expert Group):**

- JPEG is a still-image compression algorithm defined by the joint photographic expert group and serves as the foundation for digital video.
- JPEG is used in two ways in digital video world:
  1. as part of MPEG
  2. as motion JPEG
- JPEG standard has been widely adopted for video sequences.
- JPEG compression is fast and can capture full-screen, full-rate video.
- JPEG was designed for compressing either full-color or gray-scale Digital images of real-world scenes.
- JPEG is a highly sophisticated technique that uses three steps:

The first step, a technique known as DCT (discrete cosine transformation).

Next, a process called quantization manipulates the data and compresses strings of identical pixels by run length encoding method.

Finally, the image is compressed using a variant of Huffman encoding.

- A use full property of the JPEG is the degree of looseness.

### **DESKTOP VIDEO PROCESSING**

- Video on the desktop is a key element in turning a computer into a true multimedia platform.
- PC has steadily become a highly suitable platform for video.
- DESKTOP VIDEO PROCESSING includes upgrade kits, sound cards, video playback accelerator board, video capture hardware and editing software.
- Microphones, speakers, joystick, and other peripherals are also needed.

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### **Desktop video hardware for playback and capture:**

- Desktop video require a substantial amounts of disk space and considerable CPU horse-power.
- It also requires specialized hardware to digitize and compress the incoming analog signal from video tapes.
- .The two lines of video playback products become available in the marketplace I.e. video ASIC chips and board level products.

### **Video playback:**

- The two lines of video playback products become available in the marketplace I.e. video ASIC chips and board level products.
- Broadly speaking, two types of accelerator boards are available:
  - Video
  - Graphics

### **Video capture and editing:**

- Video capture board are essential for digitizing incoming video for use in multimedia presentations or video conferencing
- Video capture program also include video-editing functions that allows users crop, resize and converts formats and add special effects for both audio and video like fade-in, Embosses, zooma and echo's.
- Developers are crating next generation editing tools to meet business presenters and video enthusiasts.
- The best graphical editing tools make complex procedures accessible even to novice users.

### **Desktop video application software:**

- The text that appear in the movie. Any PC wants to handle digital video must have a digital-video engine available.
- Two significant digital video engines are :
  1. Apple's QuickTime
  2. Microsoft's video for windows
- These two are software's only; they don't need any special hardware.

Apple's QuickTime:

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- QuickTime is a set of software programs from apple that allows the operating system to pay motion video sequences on a PC without specialized hardware.
- QuickTime has it s own set of compression/decompression drivers.
- Apple's QuickTime was the first widely available desktop video technology to treat video as a standard data type.
- In this video data could not be cut, copied, and pasted like text in a page composition program.
- Apple's QuickTime movie can have multiple sound tracks and multiple video tracks.
- Apple's QuickTime engine also supports synchronize

### **Microsoft's video for windows:**

- Microsoft's video for windows is a set of software programs from Microsoft that allows the operating system to pay motion video sequences on a PC without specialized hardware.
- Microsoft video for windows has its own set of compression/decompression drivers.
- Microsoft chooses a frame-based model, in contrast to QuickTime-based model.

### **Desktop video conferencing**

- Desktop video conferencing is gaining momentum as a communication tool. Face-to-face video conferences are already a common practice, allowing distant colleagues to communicate without the expense and inconvenience of traveling.
- Early video conferencing utilized costly equipment to provide room-based conferencing, but now it becoming fast due to desktop video conferencing in this we participated by sit at their own desks, in their own offices, and call up others using their PCs much like telephone.
- **The Economics:**
- Three factors have made desktop video conferencing:
  - Price: The price fallen from 500,000\$ to 500-1000\$
  - Standards: standards allowing interoperable communications between machines from diff vendors.
  - Compression: It uses better and faster compression methods.

### **Types of desktop video conferencing:**

- Desk top video conferencing system coming onto the market today are divided into Three types they are based on plain old telephone lines:



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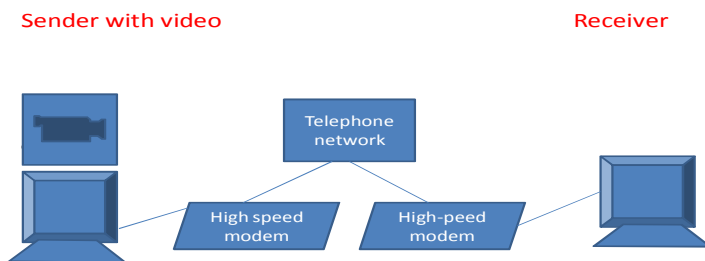
1. POST
2. ISDN
3. Internet

## Using POST for video conferencing:

- POST systems are especially attractive for Point-to-Point conferencing because no additional monthly charges are assessed and special arrangements with the telephone company are unnecessary.
- The drawback with a POST solution is a restriction to the top speed of today's modems of 28.8 Kbps.
- It need a s/w ,once properly installing a s/w users allows to pipe video,audio,and data down a standard telephone line.

Lecture 6

### Point-to-Point video conferencing using POTS



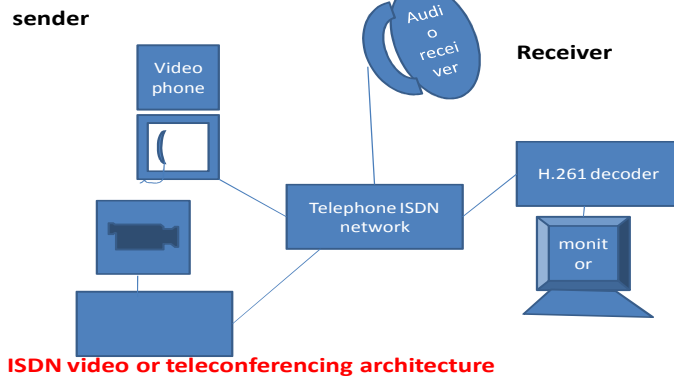
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## Using ISDN for video conferencing:

- ISDN lines mostly offer considerable more bandwidth up to 128 Kbps, but it require the installation of special hardware.
- The use of ISDN has been restricted to companies especially in private residence.
- The fallowing fig explains the basic architecture for television or video conferencing using ISDN network transport switching.
- This architecture is commonly found in videophones. Networks required for video conferencing are fiber optic cable or analog POST.
- For video compression and decompression, the ISDN networks uses the H.261 technology, it is specified by the international telegraph and telephone consultative committee algorithm.

## Lecture 6



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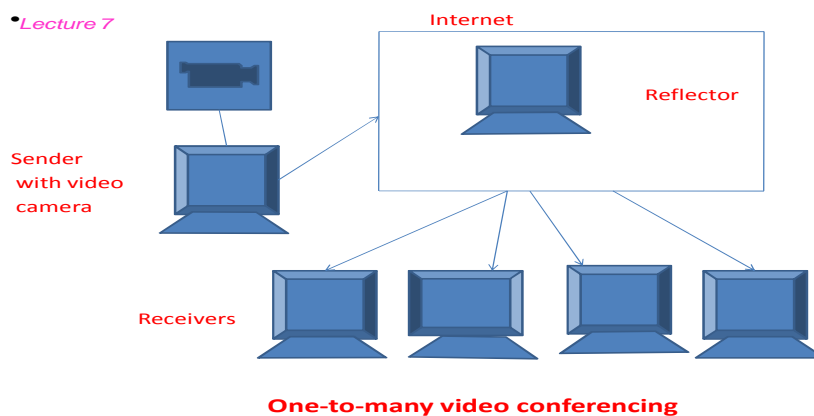
## Using the Internet for Video Conferencing:

- The two video conferencing programs are available on the internet:
  1. CU- See Me
  2. MBONE

### CU- See Me:

- CU- See Me is the first software available for the Macintosh to support real-time multiparty video conferencing on the internet.
- CU- See Me provides a one-to-one , one-to-many , several-to- several and several-to-many conferencing depending on the user needs with minimal cost.

## Lecture 7



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### MBONE:

- It is a virtual network built on top of the Internet
- Invented by Van Jacobson, Steve Dearing and Stephen Caner in 1992.

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- The purpose of MBONE is to minimize the amount of data required for multipoint audio / video-conferencing
- MBONE is free; it uses a network of m routers that can support IP Multicast.
- It enables access to real-time interactive multimedia on the Internet
- MBONE uses a small subset of the class D IP address space(224.0.0.0 - 239.255.255.255) assigned for multicast traffic.
- MBONE uses 224.2.0.0 for multimedia conferencing

### Characteristics:

- topology: combination of mesh and star networks
- IP addresses: 224.2.0.0; routing schemes: DVMRP, MOSPF
- session registration: IGMP protocol
- traffic requirement: audio 32-64 kbit/s, video 120 kbit/s

### MBONE tools:

- Videoconferencing: vic -t ttl destination-host/port (supports: NV, H.261, CellB, MPEG, MJPEG)
- Audio conferencing: vat -t ttl destination-host/port (supports: LPC, PCMU, DVI4, GSM)
- Whiteboard: wb destination-host/port/ttl
- session directory: sdr