E-Commerce

UNIT- I

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Commerce

- **COMMERCE : COMMERCE refers to all those activities which help directly or indirectly in the distribution of goods to the ultimate consumer.**
- **Functions of commerce :**
  1. **Removes Personal Hindrance**
  2. **Removes Place Hindrance**
  3. **Removes Time Hindrance**
  4. **Removes Finance Hindrance**
  5. **Removes Risk Hindrance**

  Hindrance: barrier, block, difficulty, drawback, limitation, obstacle restriction, stoppage

  Personal Hindrance : Personal Hindrance Removed by Trader manufacturer, wholesaler, retailer
- **Place Hindrance : Place Hindrance Removed by Transport**
- **TIME HINDRANCE : TIME HINDRANCE Removed by warehousing**
- **Finance hindrance : Finance hindrance Banks remove this hindrance**
- **Risk hindrance : Risk hindrance Removed by Insurance**

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Commerce

- *Commerce* means the whole system of an economy that constitutes an environment for business.
- The system includes legal, economic, political, social, cultural, and technological systems that are in operation in any country.
- Commerce is a system or an environment that affects the business prospects of an economy or a nation-state.
- We can also define it as a second component of business which includes all activities, functions and institutions involved in transferring goods from producers to consumers.

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Overview of e-Commerce

- **Commerce**
  - **Conducting business in which buyers and sellers come together in a market place to exchange information, products, services and payments**
  - **Conducted in buildings, personal interactions also involved**
- **Electronic Commerce**
  - **Market place is electronic. Business transactions occur across a telecommunications network (Electronic market place – Market space) where buyers, sellers and others involved in the business transaction.**
  - **People rarely see / know each other, physically located anywhere in the world.**

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Overview of e-Commerce

- **Electronic commerce is a modern business methodology that addresses the needs of organizations, merchants and consumers to cut costs while improving the quality of goods and services and increasing the speed of service delivery.**
- **e-commerce is associated with the buying and selling of information, products and services over the Internet**

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Overview of e-Commerce

- **Information processing in e-commerce can be categorized as**
  - **Transactions between a company and the consumer over public networks for the purpose of home shopping home banking using encryption for security and electronic cash, credit or debit tokens for payment.**
  - **Transactions with trading partners using Electronic Data Interchange (EDI).**
  - **Transactions for information gathering such as market research using bar code scanners, information processing for managerial decision making or organizational problem solving, and information manipulation for operations and supply chain management.**
  - **Transactions for information distribution with prospective customers, including interactive advertising, sales and marketing.**

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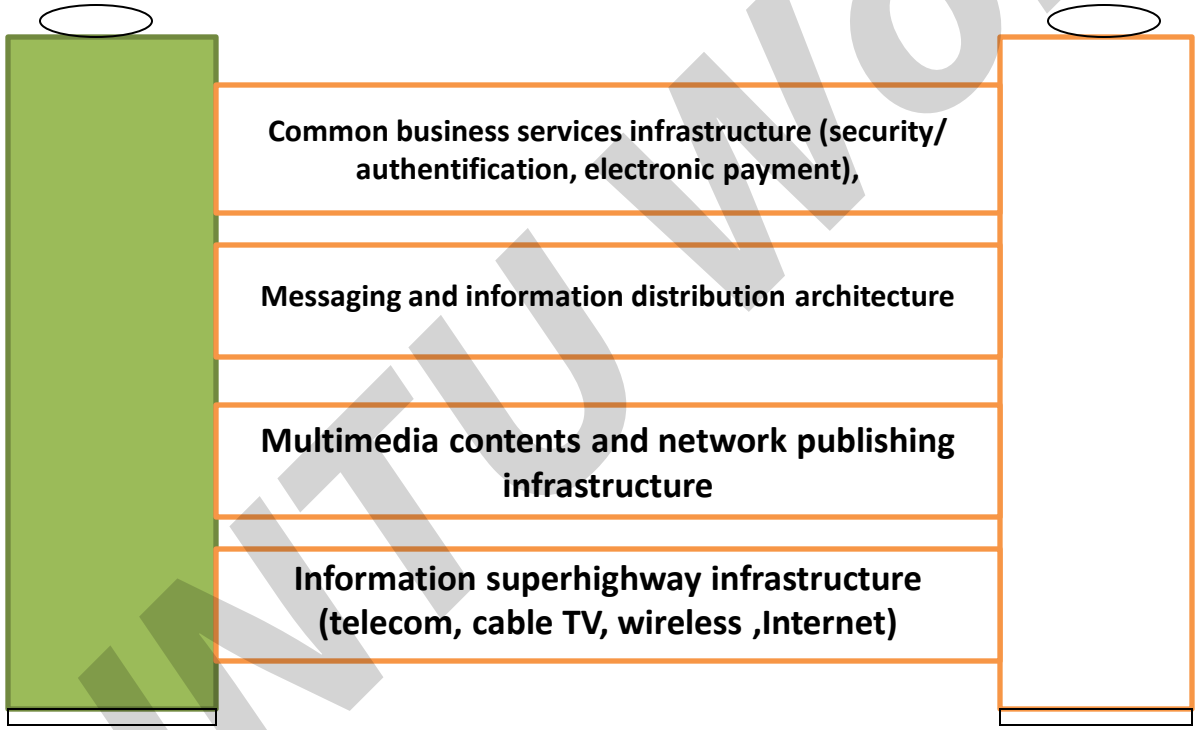
e-Commerce – Framework



- Public policy legal and privacy issues

Technical Stds for electronic docs, multimedia and network protocols

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e-Commerce – Framework

- Building Blocks in the infrastructure
  - Common business Services, for facilitating the buying and selling processes
  - Messaging and information distribution.
  - Multimedia contents and network publishing – for creating a product and a means to communicate about it.
  - The Information super high way – for providing the high way system along which all e-commerce must travel
- Two supporting pillars for e-commerce are
  - Public policy to govern such issues as universal access, privacy and information pricing
  - Technical standards, to dictate the nature of information publishing, user interfaces and transport in the interest of compatibility across the network.

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e-Commerce – Framework

- **Elements of the framework:**
  - **Any successful e-commerce application will require the I-way infrastructure in the same way that regular commerce needs the interstate high way network to carry goods from point to point. The I-way will be a mesh of interconnected data high ways of many forms: telephone wire, cable TV wires, radio based wireless- cellular and satellite.**
    - **On the I-way the nature of vehicular traffic is extremely important. The information and multimedia content determines what type of vehicle is needed.**
      - **Movies = Video + Audio**
      - **Digital games = Music + Video + Software**
      - **Electronic Books = Text + data + Graphics + Music + Photographs + video**

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e-Commerce – Framework

- **Elements of the framework:**
  - **On the I- way messaging software moves the information from one point to another in the form of e-mail, EDI, or point-to-point file transfers.**
  - **Encryption and decryption methods have been developed to ensure security of the contents while traveling the I-way and at their destination and numerous electronic payment schemes are being developed to handle highly complex transactions with high reliability.**
  - **In information traffic, public policy issues deal with the cost of accessing information, regulation to protect consumers from fraud and to protect their right to privacy and the policing of global information traffic to detect information pirating**
  - **Standards are crucial in the world of global e-commerce to ensure not only seamless and harmonious integration across the transportation network but access of information on any type of device the consumer chooses and on all types of operating systems.**

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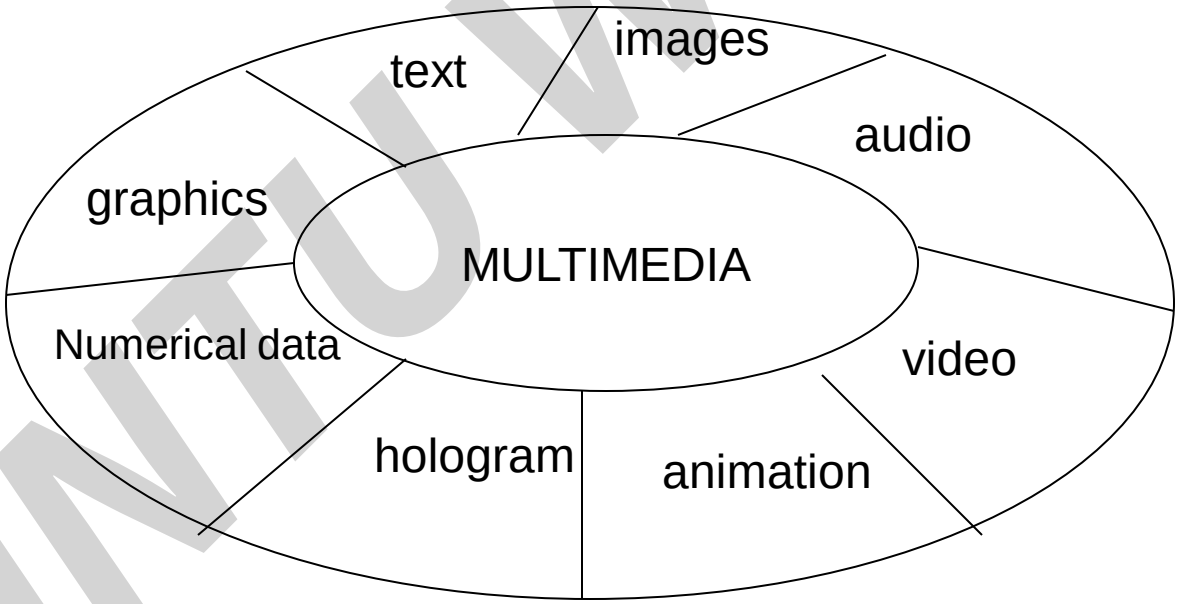
The Anatomy of e-Commerce Applications

- **Multimedia Contents for e- Commerce Applications**
  - **Multimedia is the use of digital data in more than one format, such as the combination of text, video, audio, and graphics in a computer file/document.**



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The Anatomy of e-Commerce Applications

- Multimedia mimics the natural way people communicate. Its purpose is to combine the interactivity of a user friendly interface with multiple forms of content.
- The success of e-commerce application depends on the variety and innovativeness of multimedia content and packaging.

- **Multimedia Storage servers and e-commerce applications:**
  - e-commerce requires robust severs to store and distribute large amounts of digital content to consumers. These servers must handle large scale distribution, guarantee security and complete reliability.

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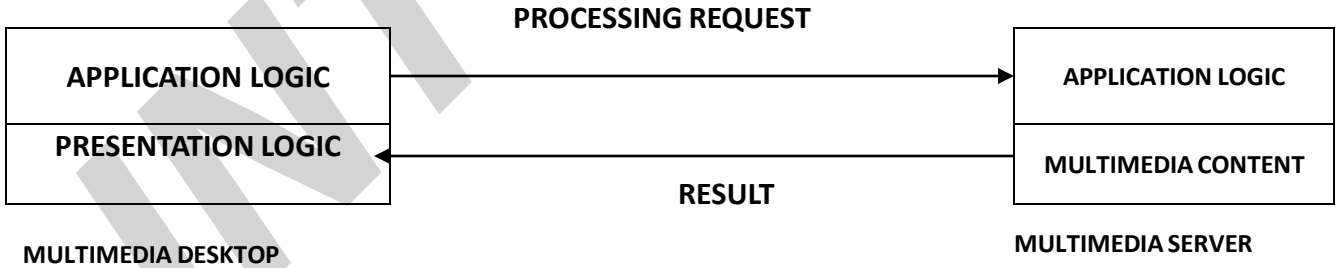
The Anatomy of e-Commerce Applications

- **Client Server Architecture in E-Commerce:**
  - **All e-commerce applications follow the client server model.**
  - **The client server model allows the client to interact with the server through a request reply sequence governed by a paradigm known as message passing.**
  - **The server manages applications tasks handles storage and security and provides scalability – ability to add more clients as needed for serving more customers – and client devices handle the user interface.**



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The Anatomy of e-Commerce Applications

- **Internal Processes of Multimedia Servers:**
  - **Internal processes involved in the storage, retrieval and management of multi media data objects are integral to e-commerce applications. Most multimedia servers provide a core set of functions to display, create, and manipulate multimedia documents over computer networks and to store and retrieve multimedia documents**
- **A multimedia server must do the following:**
  - **Handle thousands of simultaneous users**
  - **Manage the transactions of these users**
  - **Deliver information streams to consumers at affordable costs.**
- **For these requirements platform choices include high-end symmetric multiprocessors, clustered architecture and massive parallel systems.**

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The Anatomy of e-Commerce Applications

- **Video Servers and Electronic Commerce:**
  - **Video servers are an important link between the content providers and transport providers.**
  - **Video Servers are designed to deliver information to hundreds of consumers simultaneously via public telecommunications and cable networks**
- **Information Delivery/ Transport and e-commerce Applications**
  - **Transport providers are principally telecommunications, cable, and wireless industries, computer networks.**
  - **Different route providers are**
    - **Telecon based including long-distance and local telephone service providers. It cannot handle live-transmissions and the picture it produces is not as clear as that provided by a well tuned cable hookup.**

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The Anatomy of e-Commerce Applications

- Different route providers are
  - Cable based : Depend on coaxial cable as transport roads and will help determine which broadband application and services the viewing public prefers.
  - Computer network based: These providers are often dial-up linkages of lower bandwidth when compared to telecom and cable high ways.
  - Wireless: Are typically radio based cellular, satellite and light based.
  - Currently about 65% of e-commerce applications are delivered on-line via computers equipped with modems.

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The Anatomy of e-Commerce Applications

- **Consumer Access Devices:**
  - **How the majority of users will access e-commerce applications is heavily linked to the access device they opt to use.**
  - **Number of devices can provide access to information: Video phones, PCs capable of handling multimedia, personal digital assistants, televisions capable of two-way transmission, cellular phones, mobile and portable computers.**

Information consumers	Access Devices
Computers with audio and video capabilities	Personal/Desk top computing mobile computing
Consumer ElectronicsTelevision + Set-top box game systems	Television + Set-top box game systems
Personal digital assistants (PDAs), Pen based computing Voice driven computing, Software agents	Pen based computing Voice driven computing, Software agents

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Architectural Framework for Electronic Commerce

- **Electronic commerce application architecture consists of six layers of functionality or services.**
  - **Applications**
  - **Brokerage services, data or transaction management**
  - **Interface and support layers**
  - **Secure messaging, security and electronic document interchange**
  - **Middleware and structured document interchange**
  - **Network infrastructure and basic communication services**
  - **These layers cooperate to provide a seamless transition between today's computing resources and those of tomorrow by transparently integrating information access and exchange within the context of the chosen application**

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Architectural Framework for Electronic Commerce

Application Services	**Customer –to-business** **Business-to-business** **Intra-organizational**
Brokerage and data management	**Order Processing-mail-order houses** **Payment schemes-electronic cash** **Clearing house or virtual mail**
Interface layer	**Interactive Catalogs** **Directory Support functions** **Software agents**
Secure Messaging	**Secure hypertext transfer protocol** **Encrypted e-mail, EDI** **Remote Programming (RPC)**
Middleware Services	**Structured documents (SGML,HTML)** **Compound documents(OLE,OpenDoc)**
Network Infrastructure	**Wireless – cellular, radio** **Wireline –coaxial, fiber optic**

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Architectural Framework for Electronic Commerce

- **Electronic Commerce Application Services**
  - **Three distinct classes of electronic commerce applications**
    - **Customer to business**
    - **Business to Business**
    - **Intra organization**
- **Consumer-to-Business Transaction**
  - **This is called market place transaction. In a market place transaction, customers learn about products differently through electronic publishing, buy them differently using electronic cash and secure payment systems and have them delivered differently.**

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Architectural Framework for Electronic Commerce

- **Business-to-Business Transactions**
  - **This is called market link transaction. Businesses, government and other organizations depend on computer-to-computer communication as a fast, an economical, and a dependable way to conduct business transactions. Business-to-Business transactions include the use of EDI and electronic mail for purchasing goods and services, buying information and consulting services, submitting requests for proposals and receiving proposals.**

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Architectural Framework for Electronic Commerce

- **Intraorganizational Transactions:**
  - **This is called market driven transactions.**
  - **A company becomes market driven by dispersing throughout the firm information about its customers and competitors; by spreading strategic and tactical decision making so that all units can participate; and by continuously monitoring their customer commitment by making improved customer satisfaction an ongoing objective.**
  - **Three major components of market driven transactions are**
    - **customer orientation through product and service customization;**
    - **cross-functional coordination through enterprise integration**
    - **advertising, marketing and customer service.**

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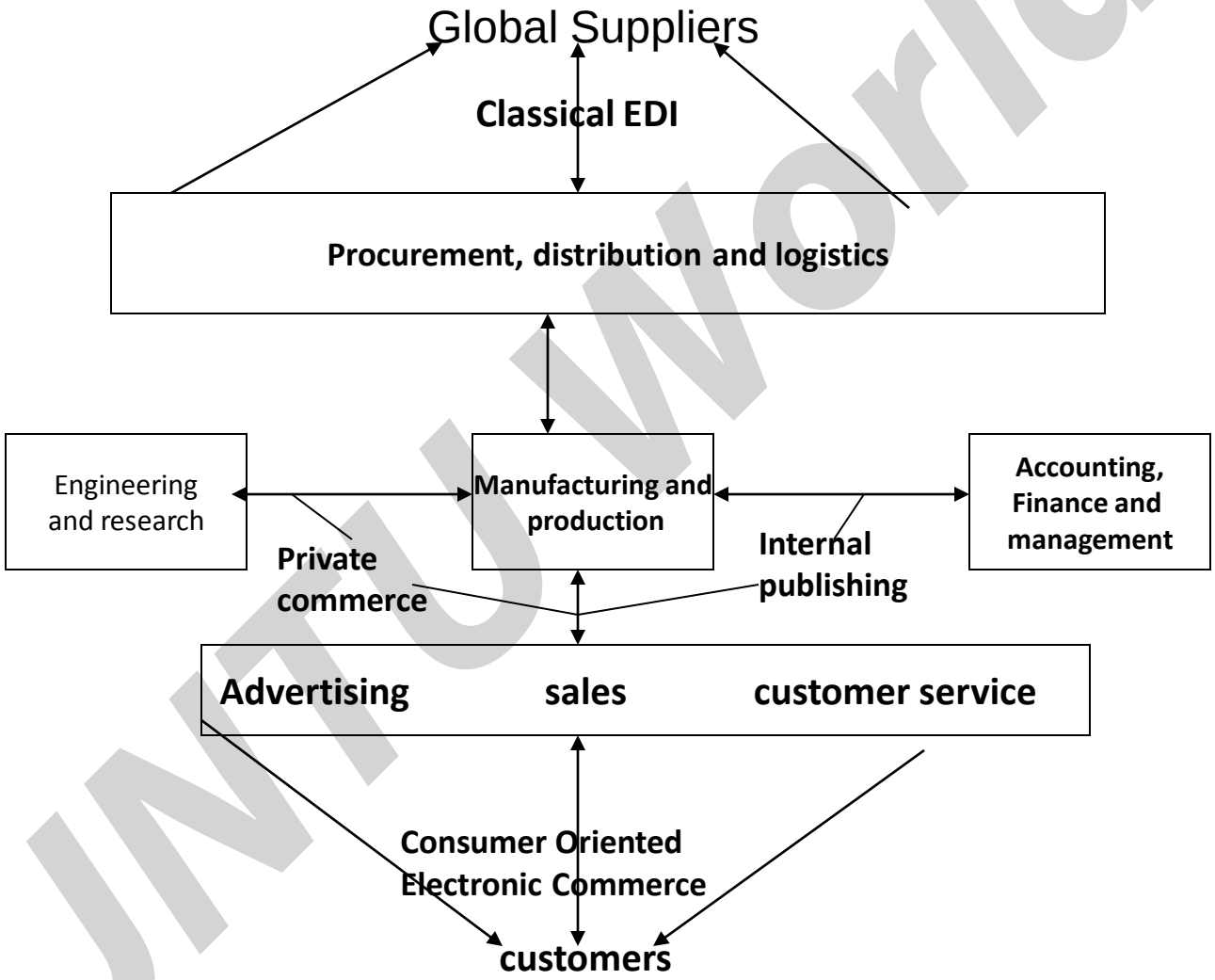

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Architectural Framework for Electronic Commerce

- **Information Brokerage and Management:**
  - **Information brokerage and management layer provides service integration through the notion of information brokerages, the development of which is necessitated by the increasing information resource fragmentation.**
  - **Information brokers are becoming necessary in dealing with the voluminous amounts of information on the networks. With the complexity associated with large number of on-line databases and service bureaus, it is impossible to expect humans to do searching. Information broken or software agents that act on the searchers behalf.**

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Architectural Framework for Electronic Commerce

- **Information Brokerage and Management:**
  - **Ex: In foreign exchange trading, information is retrieved about the latest currency exchange rates in order to hedge currency holdings to minimize risk and maximizing profit.**
  - **Brokerage function supports data management and traditional transaction services. This is accomplished by tools such as software agents, distributed query generator, the distributed transaction generator, and the declarative resource constraint base – which describes a business's rule and environment information.**

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Architectural Framework for Electronic Commerce

- **Interface and Support Services**
  - **This layer provides interfaces for electronic commerce applications such as interactive catalogs and will support directory services – functions necessary for information search and access.**
  - **Interactive catalogs are the customized interface to consumer applications such as home shopping.**
  - **Directories operate behind the scenes and attempt to organize the enormous amount of information and transactions generated facilitate electronic commerce.**
  - **The primary difference between the two is that unlike interactive catalogs, which deal with people, directory support services interact directly with software**

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Architectural Framework for Electronic Commerce

- **Secure Messaging and structured Document Interchange Services**
  - **Messaging is the software that sits between the network infrastructure and the clients or electronic commerce applications, masking the peculiarities of the environment.**
  - **Messaging services offer solutions for communicating non-formatted data –letters, memos, reports – as well as formatted data such as purchase orders, shipping notices, and invoices.**

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Architectural Framework for Electronic Commerce

- **Secure Messaging and structured Document Interchange Services**
  - **Unstructured messaging consists of Fax, e-mail, and form based systems like Lotus Notes. Structured documents messaging consists of the automated interchanging standardized and approved messages between computer applications. Ex: EDI**
  - **Messaging supports both synchronous and asynchronous message delivery and processing. It is not associated with any particular communication protocol. With messaging tools, people can communicate and work together more effectively.**

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Architectural Framework for Electronic Commerce

- **Secure Messaging and structured Document Interchange Services**
  - **Due to lack of standards, there is often no interoperability between different messaging vendors leading to islands of messaging.**
  - **Security, privacy and confidentiality through data encryption and authentication techniques are important issues that need to be resolved for ensuring the legality of the message based transactions.**

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Architectural Framework for Electronic Commerce

- **Middleware Services**
  - **With the growth of networks, Client–Server technology, and all other forms of communicating between / among unlike platforms, the problems of getting all the pieces to work together became a necessity.**
  - **Middleware helps to mediate between diverse software programs that enables them talk to one another. To achieve data-centric computing, middleware services focus on three elements; transparency, transaction security and management and distributed object management and services.**

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Architectural Framework for Electronic Commerce

- **Middleware Services**
  - **Transparency:**
    - **Transparency implies that users should be unaware that facilitates a distributed computing environment.**
    - **Transparency is accomplished using middleware that facilitates a distributed computing environment. This gives users and applications transparent access to data, computation, and other resources across collections of multi vendor, heterogeneous systems.**

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Architectural Framework for Electronic Commerce

- **Middleware Services**
  - **Transaction Security and Management**
    - **Security and management are essential to all layers in the electronic commerce model.**
    - **At the transaction security level, two broad general categories of security services exist; authentication and authorization. For electronic commerce, middleware provides the qualities expected in a standard TP system: ACID properties.**

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Architectural Framework for Electronic Commerce

- **Middleware Services**
  - **Distributed Object Management and Services**
    - **Object orientation is proving fundamental to the proliferation of network based application.**
    - **Instance of an object in electronic commerce is a document. The term object is being used interchangeably with document resulting in a new form of computing called document oriented computing. The trend is moving from single data type documents to integrated documents known as compound architectures**

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e-commerce consumer Applications

- Entertainment on-demand
  - Video on-demand
  - News on-demand
- Electronic Retailing via catalogs and kiosks
- Home shopping
- Interactive distance education
- Collaboration through desktop video conferencing
- Medical consultations

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e-commerce Organization Applications

- **Changing Business Environment**
  - **The traditional business environment is changing rapidly as customers and businesses seek the flexibility to change trading partners, platforms, carriers, and networks at will. The Information Superhighway allow business to exchange information among constantly changing sets of customers, suppliers, and research collaborators in government and academia on a global basis. It will become a powerful business tool that no organization can do without.**
  - **Companies are restructuring. Lean and mean is the objective of companies seeking increased market share to offset decreasing profit margins and to gain competitive global positioning through reduced operational costs**

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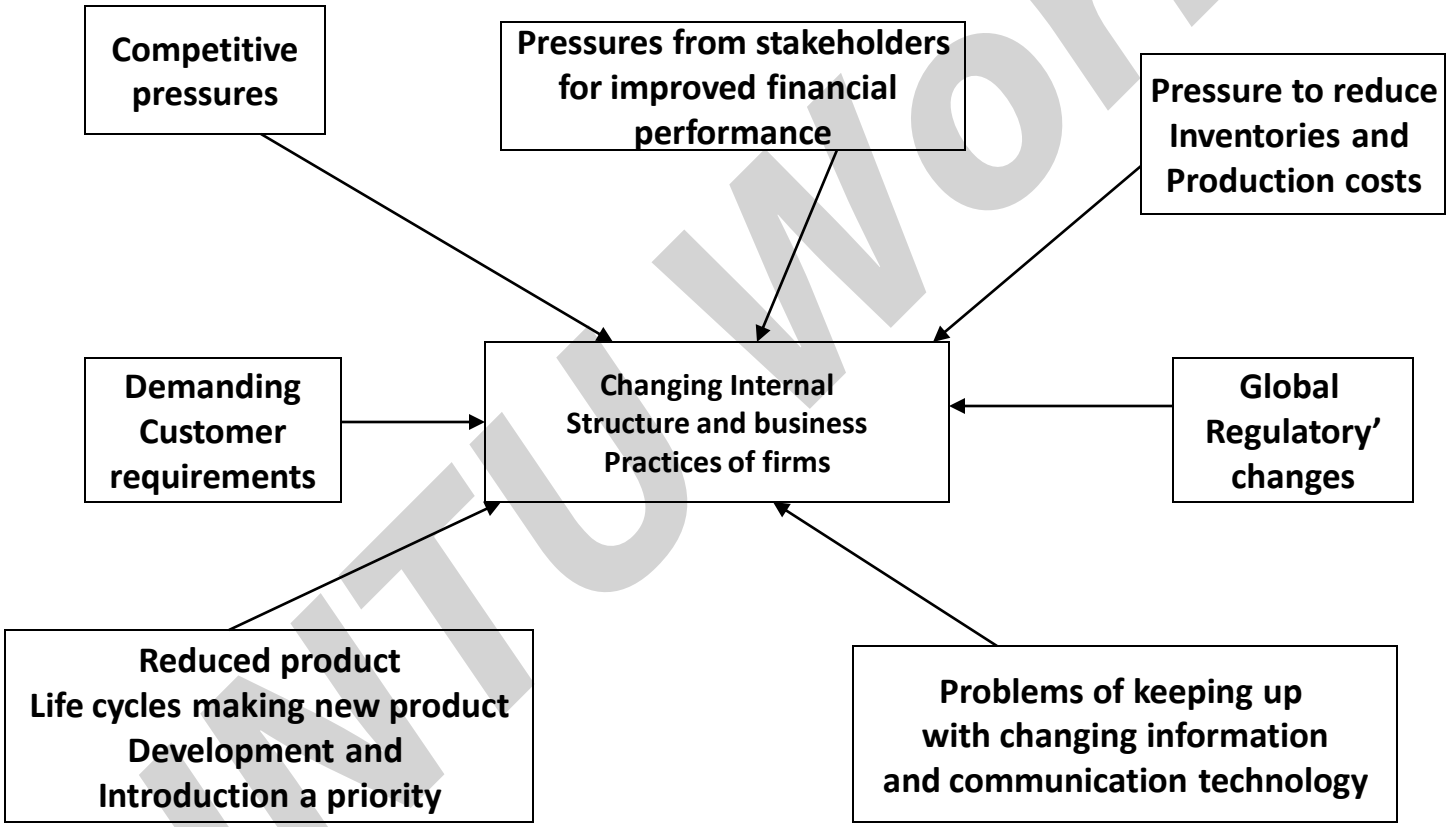
e-commerce Organization Applications



Pressures influencing business

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e-commerce Organization Applications

- **Electronic Commerce and Retail Industry**
  - **Consumers are pushing retailers to the wall, demanding lower prices, better quality, a large selection of in-season goods. Retailers are slashing back-office costs, reducing profit margins, reducing in times, buying more wisely, and making huge investments in technology. They are putting the pressure on the manufacturing and supplier end of the pipeline**

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e-commerce Organization Applications

- **Marketing and Electronic commerce**
  - **Electronic commerce is forcing companies to rethink the existing ways of doing target marketing, relationship marketing, and event marketing.**
  - **Interactive marketing is accomplished in electronic markets via interactive multimedia catalogs that give the same look and feel as a shopping channel. Consumer information services are a new type of catalog business.**

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e-commerce Organization Applications

- **Inventory Management and Organizational Applications**
  - **One often-targeted business process is inventory management. In the manufacturing industry, they are known as just-in-time inventory systems, in the retail industry as quick response programs, and in the transportation industry as consignment tracking**
    - **Just–in-time Manufacturing - Just-in-time is viewed as an integrated management system consisting of a number of different management practices dependent on the characteristics of specific plants.**
    - **The JIT is based on two principles:**
      - **» Elimination of waste**
      - **» Empowering workers**

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e-commerce Organization Applications

- **Inventory Management and Organizational Applications**
  - **The following management practices are typically associated with JIT systems**
    - **Focused factors**
    - **Reduced set-up times**
    - **Group technology**
    - **Total productive maintenance**
    - **Multifunction employees**
    - **Uniform workloads**
    - **JIT purchasing**
    - **Total quality control**
    - **Quality circles**
    - **To achieve JIT savings, many large corporations have installed private communication networks. The I-way makes this practice more affordable and easily available to a number of small firms.**

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e-commerce Organization Applications

- **Inventory Management and Organizational Applications**
  - **Quick Response Retailing:**
    - **Quick Response (QR) is a version of JIT purchasing tailored for retailing.**
    - **QR provides for a flexible response to product ordering and lowers costly inventory levels.**
    - **QR retailing focuses on market responsiveness while maintaining low levels of stocks.**
- **Supply Chain Management**
  - **Supply Chain Management includes the following functions.**
  - **Supplier Management: The goal is to produce the number of suppliers and get them to become partners in a win-win relationship.**

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e-commerce Organization Applications

- **Supply Chain Management**
  - **Inventory Management: The goal is to shorten the order-ship-bill cycle.**
  - **Distribution Management: The goal is to move documents related to shipping. Paperwork that typically took days to cycle in the past can now be sent in moments and contain more accurate data, thus allowing improved resource planning.**
  - **Channel Management: The goal is to quickly disseminate information about changing operational conditions to trading partners. Electronically linking production with their international distributor and reseller networks eliminates thousands of labor hours per week in the process.**

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e-commerce Organization Applications

- **Supply Chain Management**
  - **Payment Management: The goal is to link the 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 and flow of information among the sales, customer, and production functions.**
  - **Supply chain management process increasingly depends on electronic markets.**

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e-commerce Organization Applications

- **Work Group Collaboration Applications**
  - **For work group applications, e-commerce represents the critical component of connectivity. A ubiquitous inter-network that enables easy and inexpensive connection of various organizational segments to improve communications and information sharing among employees and to gather and analyze competitive data in real time.**
  - **E-commerce facilitates sales force automation by enabling sales people to carry product and reference information in one portable device.**
  - **Other application such as video conferencing document sharing, and multimedia e-mail are expected to reduce travel and encourage telecommuting.**
  - **Have to meet the challenges of service quality, flexibility and customization of production**

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Benefits of e-Commerce

- **Basic Benefits of e-Commerce**
  - **Increase sales - this is the first thing that people consider when dealing with e-commerce**
  - **Decreasing costs**
  - **Increase profits**
  - **Expands the size of the market from regional to national or national to international**
  - **Contract the market**
  - **Reach a narrow market**
  - **Target market segmentation allows you to focus on a more select group of customers and therefore have a competitive advantages in satisfying them**

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Benefits of e-Commerce

- Decreasing costs
  - Costs of creating the product
    - Marketing
    - Of promotional material
    - Costs of distribution
  - e.g. Netscape allowing you to download instead of waiting to get the CD by mail
- Costs of processing (orders from the customers)
  - repeat activities and information processing
  - of handling customer phone calls
  - of handling sales inquiries
  - determine product availability (inventory management)
- Costs of storing information
- Lowers telecommunication costs

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Benefits of e-Commerce

- **Provide price quotes**
  - **With a web site, one can have the prices listed, and change them**
  - **In a printed catalogue one is stuck with the expense of printing a new version if one need to change many of the prices**
- **Other Benefits ....**
  - **Enables customization of products**
  - **Allows for innovative business models**
  - **Allows for a high degree of specialization**
  - **Reduces the time exposure**
  - **Supports BPR**
  - **Increases productivity**
  - **Improves customer service**

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Benefits of e-Commerce

- A large component of business these days is dealing with other businesses (B2B) that supply parts and components. Companies supplying services often have that service broken down into sub-contracting services eg. - a building maintenance contract can be subdivided into the following services
  - Security service
    - access control
    - alarm response
  - Landscaping service
    - Summer - grass cutting
    - Winter - snow removal
    - Heating, ventilation and air conditioning service
    - Electrician service
    - Plumbing service
    - Window washing service

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Benefits of e-Commerce

- **Benefits to organizations that use e-Commerce with their business partners - manufacturers and service companies**
  - **Minimizes Supply Chain inefficiencies**
    - **reduces inventories**
    - **reduces delivery delays**
    - **enables efficient e-procurement**
  - **Build more collaborative and stronger relationships with suppliers. This includes streamlining and automating the underlying business processes, enabling areas such as**
    - **direct marketing**
    - **selling,**
    - **customer services (call centers)**
    - **procurement**
    - **replenishment and**
    - **information management.**

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Benefits of e-Commerce

- **Benefits to consumers that use e-Commerce (e-Business)**
  - **can buy when you want, from more locations (internet connected terminals) more choices**
  - **when you have more choices you can decide on a product with better features at a more competitive price**
    - **o sometimes products are less expensive online**
    - **o can receive more information about the product, make a more informed decision**
  - **greater information leads to more confidence to make a purchase decision**
  - **more info also leads to enhanced customer satisfaction because the customers has a better idea how to use the product**
- **Quicker delivery (for online products)**
- **Quick delivery is important for people who want to use the product immediately, as opposed to waiting longer - if they have to wait long, they may pick a competitor's product**

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Benefits of e-Commerce

- **Benefits to society (when consumers and business use e-Commerce)**
  - **Cocooning - more individuals can work offsite**
  - **This decreases HR costs for companies because they can have smaller office buildings, less parking spaces, fewer IT services, etc.**
  - **Less affluent people can buy more and increase standard of living**
  - **Facilitates delivery of public services**
    - **Sending out bill payment info is a significant cost for companies**

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Limitations of e-Commerce

- **Not everyone is convinced the internet will be a major way to conduct business**

- **Technical Limitations**
  - **costs of a technological solution**
  - **some protocols are not standardized around the world**
  - **reliability for certain processes**
  - **insufficient telecommunications bandwidth**
  - **software tools are not fixed but constantly evolving (ie. Netscape 3,4,4.7,4.75 etc.)**
  - **integrating digital and non-digital sales and production information**
  - **access limitations of dial-up, cable, ISDN, wireless**
  - **some vendors require certain software to show features on their pages, which is not common in the standard browser used by the majority**
  - **Difficulty in integrating e-Commerce infrastructure with current organizational IT systems**

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Limitations of e-Commerce

- Non-Technical Limitations
- customer fear of personal information being used wrongly
  - customer expectations unmet
  - rules and regulations
  - security and privacy
    - vulnerability to fraud and other crimes
  - lack of trust and user resistance
    - fear of payment information being unsecured
    - legal issues outstanding such as jurisdiction
    - legal environment has many new and conflicting laws
    - cultural obstacles
    - linguistic challenges

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Limitations of e-Commerce

- **Non-Technical Limitations**
  - **limitations of support services**
    - **financial cost**
    - **sourcing tech support in foreign languages**
  - **lack of critical mass in certain market areas for sellers and buyers**
  - **accessibility outside of urban/suburban and areas effects universality**
  - **people's resistance to change**
  - **people not used to faceless / paperless / non-physical transactions**

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Impact of e-Commerce

- On the Efficiency of the economy
  - Falling costs of Information and communication technologies
  - Impact on production costs
    - Changing firm's cost structure
      - Cost of executing a sale
        - » physical establishment, order placement /execution, customer support and after-sales service , staffing
      - Purchase orders / procurement
        - » Inventories , distribution

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Impact of e-Commerce

- On the Efficiency of the economy
  - Changing cost structure of the value added chain
    - Disintermediation
      - Reduction of distributors, retailers
      - Displacement of intermediary products –Air Travel, Stock trading
    - Re-intermediation
      - Advertising /branding , Secure on-line payments and delivery / logistics
        - » Directories, Search Services, Malls, Publishers, Virtual resellers, Web site evaluators, Financial Intermediaries,
  - Impact on Prices
    - Different pricing schemes

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Impact of e-Commerce

- **On the Firms Business Model, Sectoral Organization and Market Structure**
  - **E-commerce is transforming the market place by changing firm's business models, by shaping the relations among market actors and by contributing to changes in the market structure**
  - **Cyber Traders play a catalytic role in forcing e-commerce solutions in sectoral and national contexts**
  - **Changes firm's competitive advantages, nature of firm's competition, as well as the market on which firms compete**
  - **Likely to increase market size and change market structure in terms of number and size of players**
  - **Flexibility and adaptability of the work force will be crucial for firm to reorganize**
  - **Combination of streamlined business processes, flat organizational hierarchies, continuous training and skills acquisition, inter-firm collaboration and networking**

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Impact of e-Commerce

- **Societal Impacts**
  - **Access to digital economy**
  - **Education and Training – Change in skill mix**
  - **Pressure to perform quickly on individuals**
  - **Change in work environments**
  - **Creation of "Information haves and have nots"**

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e-commerce in India

- India is currently in the midst of an e-commerce revolution. The arrival of the Internet followed by the escalating growth of Web-based businesses is leading to e-commerce both on the B2B and the B2C sides. The e-commerce trends in India are in perfect accordance with the sweeping changes taking place in the global markets. Even the IT friendly Government has taken significant strides in the past few months to ensure that the economic climate is ripe for e-business.
- India has the potential to earn revenues worth US$ 10 billion by 2008 from e-business solutions. (Both the domestic and export markets put together).

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e-commerce in India

- **Supply Chain Management optimization and Customer Relation Management are going to be one of the strongest drivers of the global e-commerce solutions market. And more than 72 percent of Indian software houses were found to possess strong expertise in Supply Chain Management and CRM.**
- **Some of the areas of e-commerce services available are:**
  - **Legacy application integration**
  - **Internet application integration**
  - **EDI**
  - **Migration to Web-based models**
  - **New IT frameworks**
  - **Integration with business strategies**
  - **E-commerce training services**

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e-commerce in India

- **Nasscom has recommended a five-year moratorium on e-commerce transactions and also suggested a comprehensive study on the various issues involved, before a decision is taken to tax e-commerce.**
- **Due to the global nature of e-commerce, it is suggested that India should support a permanent ban on taxes on Internet access, a permanent ban on custom duties on electronic transmissions, international tax rules that are neutral, simple and certain; and simplification of state and local sales taxes.**

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e-commerce in India

- **Issues**
  - **Still to take full advantage of e-commerce**
  - **Lack of computing power – less number of computers**
  - **Access to internet**
  - **Less usage of credit cards**
  - **Lack of adequate Communication Infrastructure**

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Prospects

- **Business-To-Consumer**
  - **A number of markets are sprouting in the business-to-consumer category. Such markets include shopping malls, single-vendor retail stores and electronic software delivery.**
  - **It has been estimated that the world-wide e-Commerce market will exceed $46 billion in consumer transactions and 15% of all WWW users have used it to purchase a product or service online**
  - **It is estimated that 75% of WWW sites are sponsored by advertising, while only 25% are supported by customers. With more than 50 million users world-wide, the Internet has become a attractive market for advertisers.**
- **Business-To-Business**
  - **According to recent projections by industry analysts, Business-to-Business E-Commerce may exceed $176 billion in business transactions**

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E-Commerce

UNIT- II

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Unit- II Topics

- Consumer Oriented Electronic Commerce
- Mercantile Process Models

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Consumer-oriented Electronic Commerce

- **Consumer-Oriented Services:**

Consumer Life-style needs	Complementary Multimedia Services
Entertainment	Movies on demand, video cataloging, interactive ads, multiuser games, on-line discussions
Financial Services and information	Home banking, financial services, financial news
Essential Services	Home shopping, electronic catalogs, telemedicine, remote diagnostics
Education and training	Interactive education, multiuser games, video conferencing, on-line databases

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Consumer-oriented Electronic Commerce

- **Consumer-Oriented Services:**
  - **Consumer applications can be classified into entertainment, financial services, information, essential services, and education and training.**
  - **Four types of application areas can be envisaged.**
  - **Personal Finance Management (Remote Banking)**
    - **Home banking services are often categorized as basic, intermediate, and advanced.**
      - **Basic Services relate to:**
        - » **Account statement reporting**
        - » **Round the clock banking with automated teller machines (ATM)**
        - » **Funds Transfer**

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Consumer-oriented Electronic Commerce

- **Consumer-Oriented Applications:**
  - **Basic Services relate to:**
    - **Bill Payment**
    - **Account reconciliation**
    - **Status of Payments or "stop payment requests"**
  - **Banks introduced ATMs in the 1970s to automate deposits and cash extraction. As the ATM network expanded, customer loyalty became a thing of the past as customers began to look at technology and service as the differentiation, not the individual bank's name.**
  - **The ATM network can be thought of as analogous to the Internet, with banks and their associations being the routers and the ATM machines being the heterogeneous computers on the network. Today the ATM interface is an integral part of a bank's communications and market strategy.**

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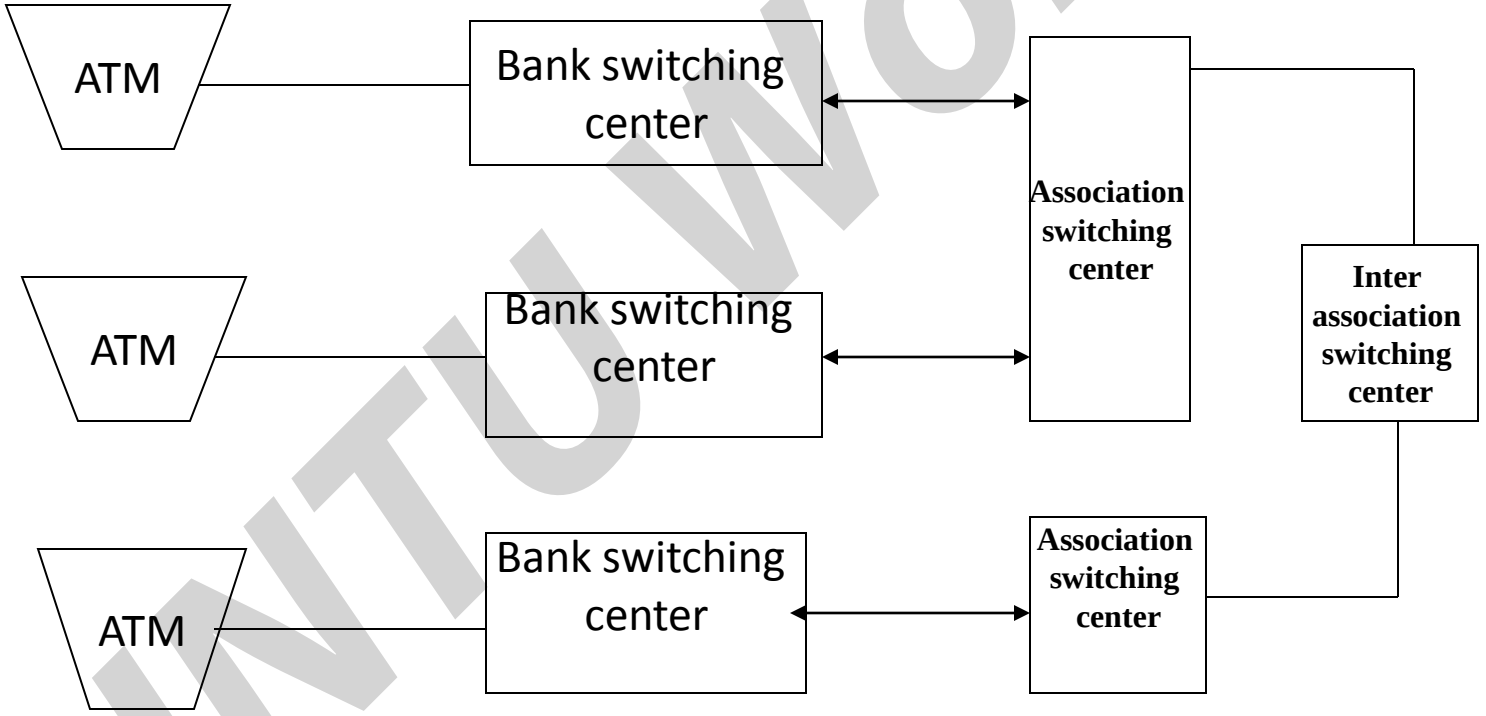
Consumer Oriented e-commerce



Structure of ATM network

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Consumer-oriented Electronic Commerce

- **Intermediate Services**
  - **Include a growing array of home financial management services like**
    - **Household budgeting**
    - **Updating stock portfolio values**
    - **Tax return preparation**
  - **For the sophisticated customer, home banking offers the facility of paying bills, transferring funds, and opening new accounts from home. As the equipment becomes less and less expensive and as banks offer a broader array of services, home banking could develop into a comprehensive package that include such non bank activities as insurance, entertainment, travel and business news.**

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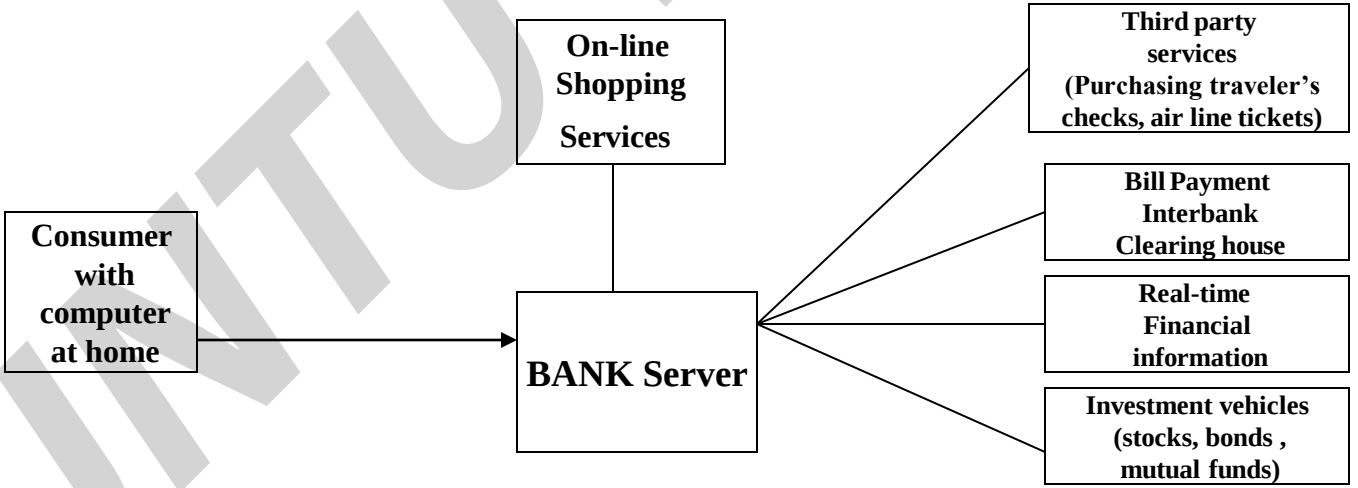
Consumer-oriented Electronic Commerce

- **Advanced Services**
  - **There is a growing push in the banking and brokerage community to develop systems that support advanced services. They require extra-ordinary integration of computer systems at the branch, central office, and partners' levels. The companies offering these services have to provide incentives such as low fees to customers to use the service.**



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Consumer-oriented Electronic Commerce

- **Home Shopping**
  - **Home shopping can be categorized as**
    - **Television based Shopping:**
      - **TV shopping has evolved over the years to provide a wide variety of goods ranging from collectibles, clothing, small electronics, house wares, jewelry and computers.**
      - **A customer uses remote control to shop different channels with the touch of a button. To target customers, channels are often specialized like fashion channel, style channel, spot light channel etc.**

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Consumer-oriented Electronic Commerce

- **Home Shopping**
  - **Catalog Based Shopping**
    - **Using a computer connected to the internet, an enquiry can be made to search various vendor catalogs which are available on line.**
    - **The on-line catalog business consists of brochures, CD-ROM catalogs and on-line interactive catalogs. Most on-line catalogs are some form of electronic brochures.**
    - **An extension of the electronic brochure concept is a multi product comprehensive on-line catalog system typically put in kiosks. Some kiosk catalogs also incorporate order taking through an in-store electronic data interchange (EDI).**

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Consumer-oriented Electronic Commerce

- **Home Shopping**
  - **Home Entertainment**
    - **In the entire home entertainment area, the key element is the notion of customer control over programming. Entertainment services are expected to play a major role in e-commerce. Entertainment market is potentially a multibillion dollar one.**
    - **To serve the information needs of the customer, service provides whose product is information delivered over the I-way are creating an entirely new industry.**
    - **One significant 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.**

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Mercantile Process Models

- **Mercantile processes define interaction models between consumers and merchants for on-line commerce. A common way of doing business over the I-way will be essential to the future growth of e-commerce. Establishment of a common mercantile process is expected to increase convenience for consumers who won't have to figure out a new business process for every single vendor.**
- **Prepurchase, purchase consummation and post-purchase interaction**
  - **Prepurchase preparation phase includes research and discovery for a set of products in the larger information space capable of meeting customer requirements and product selection from the smaller set of products based on attribute comparison.**
  - **The purchase consummation phase includes mercantile protocols that specify the flow of information and documents associated with purchasing and negotiation with merchants for suitable terms.**
  - **The post purchase interaction phase includes customer service and support to address customer complaints, product returns and product defects.**

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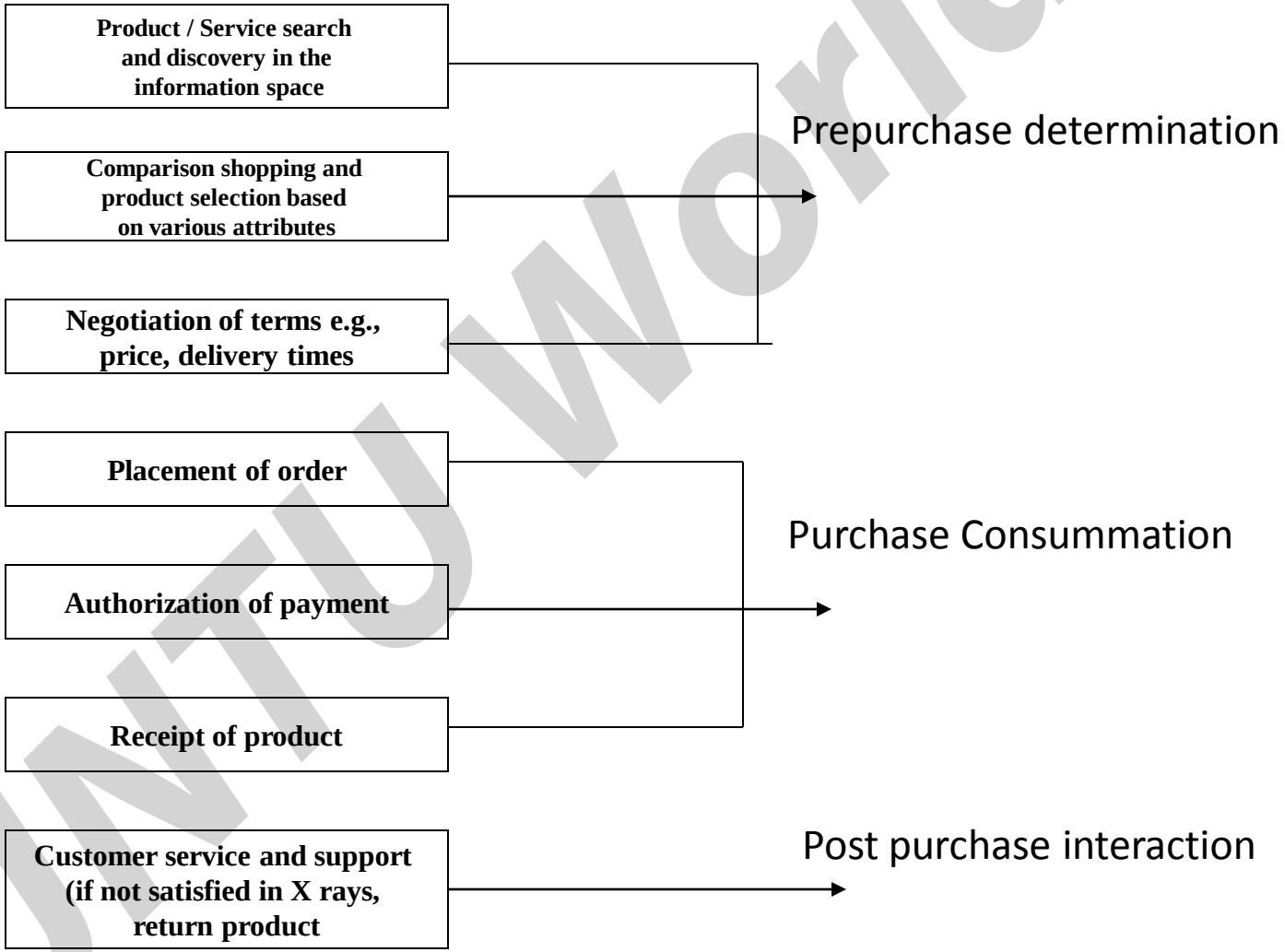
Mercantile Process Models



Mercantile model from the consumer's perspective

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Mercantile Process Models

- **Prepurchase preparation**
  - **In general consumers can be categorized as**
    - **Impulsive buyers, who purchase products quickly**
    - **Patient Buyers, who purchase products after making some comparisons**
    - **Analytical buyers, who do substantial research before making the decision to purchase products or services.**
- **In most retailing sectors, impulse/unplanned purchasing is a major factor.**

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Mercantile Process Models

- **Prepurchase preparation**
  - **Marketing researchers have isolated several types of purchasing.**
    - **Specially planned Purchase: The need was recognized on entering the store and shopper bought the exact item planned.**
    - **Generally Planned Purchase: The need was recognized, but the shopper decided in store on the actual manufacturer of the item to satisfy the need.**
    - **Reminder Purchases: The shopper was reminded of the need by some store influence.**
    - **Entirely Unplanned Purchases: The need was not recognized till entering the store**

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Mercantile Process Models

- **Prepurchase preparation**
  - **Consumer Information Search Process**
    - **Information search is defined as the degree of care, perception and effort directed toward obtaining data or information related to the decision problem. In the context of e-commerce, information search can be classified into two categories – Organizational and consumer search.**
  - **<u>Organizational Search Process</u>:**
    - **Organization search can be viewed as a process through which an organization adapts to such changes in its external environment as new suppliers, new products, and new services.**
    - **The organizational search process is determined in part by market characteristics and by certain aspects of a firm's present buying situation.**
    - **The rate of information change in the market place imposes additional demands on a firm's search process.**

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Mercantile Process Models

- **Prepurchase preparation**
- **Information Brokers and Brokerages**
  - **To facilitate better consumer and organizational search, intermediaries called information brokers or brokerages are coming into existence.**
  - **Information brokerages are needed for three reasons – compassion shopping, reduced search costs and integration. Information formerly found at more or less the same high prices on all the on-line database search services can sometimes be found at other service bureaus at minute fractions of those charges.**

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Mercantile Process Models

- **Purchase Consummation**

  A mercantile transaction is defined as the exchange of information between the buyer and seller followed by the necessary payment.

  A Simple mercantile model would require the following transactions.

  1. **Buyer contacts vendor to purchase product or service. This dialogue might be interactive on-line-through world wide web (WWW), e-mail, off-line through an electronic catalog and telephone.**
  2. **Vendor states price.**
  3. **Buyer and vendor may or may not engage in negotiation**
  4. **If satisfied, buyer authorizes payment to the vendor with an encrypted transaction containing a digital signature for the agreed price.**

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Mercantile Process Models

- **Purchase Consummation**
  5. **Vendor contacts his or her billing service to verify the encrypted authorization for authentication.**
  6. **Billing service decrypts authorization and checks buyer's account balance or credit and puts a hold on the amount of transfer.**
  7. **Billing service gives the vendor the "green light" to deliver product and sends a standardized message giving details of transaction for merchants records.**
  8. **On notification of adequate funds to cover financial transaction, vendor delivers the goods to buyer or in the case of information purchase provides a crypto key to unlock the file.**
  9. **On receiving the goods, the buyer signs and delivers receipt. Vendor then tells billing service to complete the transaction.**
  10. **At the end of the billing cycle, buyer receives list of transactions. Buyer can either deny certain transactions or complain about over billing.**

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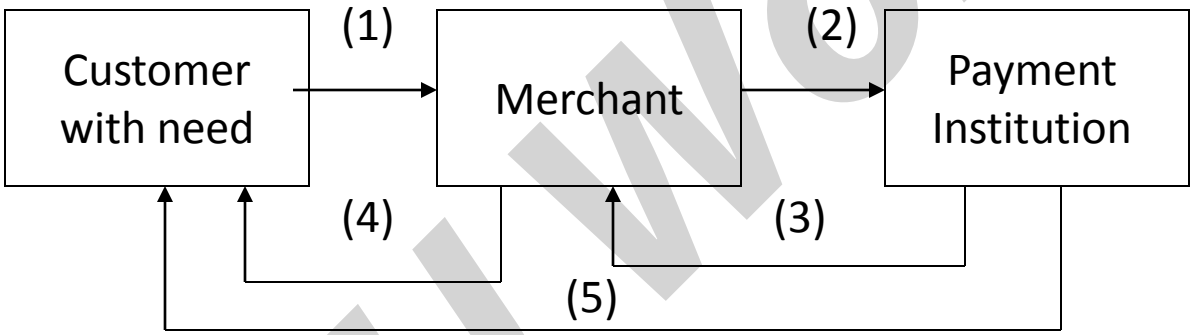
Mercantile Process Models



1. **Buy Request**
2. **Remittance Request**
3. **Approval**
4. **Delivery**
5. **Monthly Statement**

On-line Mercantile Model

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Mercantile Process Models

- **Mercantile Process Using Digital Cash**

Electronic cash is similar to paper currency and has the benefits of being anonymous and easily transmitted electronically. The following is a generic mercantile protocol based on the use of e-cash.

1. **Buyer obtains anonymous e-cash from issuing bank.**
2. **Buyer contacts seller to purchase product**
3. **Seller states price.**
4. **Buyer sends e-cash to seller**
5. **Seller contacts his bank or billing service to verify the validity of the e-cash.**
6. **Bank gives okay signal to seller after ensuing that the e-cash hasn't been duplicated or spent as other products.**
7. **Seller delivers the product to buyer**
8. **Seller then tells the bank to mark the e-cash as "used" currency.**

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Mercantile Process Models

- **Mercantile Transaction Using Credit Cards**
  - **Two major components comprise credit card transactions in the mercantile process - Electronic authorization and settlement.**
  - **In retail transaction, a Third Party Processor (TPP) captures information at the point of the 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.**
  - **<u>Steps involved in a retail transaction:</u>**
    - **A customer presents a credit card for payment at a retail location. The point of sale device scans the information on the card's magnetic stripe.**
    - **The point-of-sale software directs the transaction to the local network access point.**

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Mercantile Process Models

- **Mercantile Transaction Using Credit Cards**

  - **Steps involved in a retail transaction:**
    - **Once in the network, the system verifies the source of the transaction and routes it to the appropriate authorization source, where the cardholder's account record is reviewed. An authorization code is then sent back through the network for display on the point-of-sale device.**
    - **Periodically the retail location initiates a "close-out" transaction that bundles completed transaction information into a "batch".**
    - **The system gathers all completed batches and processes the data in preparation for settlement.**

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Mercantile Process Models

- **Mercantile Transaction Using Credit Cards**
  - **Steps involved in a retail transaction:**
    - **The pricing of electronic transaction services provided by TPP to merchant clients takes one of two forms.**
      - **In the first form, 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 and settlement**
- **Postpurchase Interaction:**
  - **As long as there is payment for services, there will be refunds, disputes, and other customer service issues that need to be considered.**
  - **Returns and claims are an important part of the purchasing process that impact administrative costs, scrap and transportation expenses and customer relations.**

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Mercantile Process Models

- **Other challenges that may arise are:**
  - **Inventory Issues: If the item is in stock, a company must be able to assign that piece to the customer and remove it form available inventory. Otherwise the disappointed customer tries to find alternative products.**
  - **Data Base and compatibility Issues: User can be able to access instantly the information from the vendor computers**
  - **Customer service issue: Customer's questions should be resolved on on-line basis for a better service.**

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Mercantile Process Models

- **Mercantile Models - Merchant's Perspective**
  - **To fully realize and maintain a competitive advantage in the on-line environment, a company must build a robust vision of what its order-to-delivery cycle, and all the business processes that support it.**
  - **The order management cycle (OMC) includes eight distinct activities. OMC has the following generic steps.**
    - **Order Planning and Order Generation:**
      - **Order planning leads to order generation. Orders are generated in a number of ways in the e-commerce environment. The sales force broadcasts ads, sends personalized e-mail to customers or creates a WWW page..**

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Mercantile Process Models

- **Mercantile Models - Merchant's Perspective**
  - **Cost Estimation and Pricing:**
    - **Pricing is the bridge between customer needs and 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 and cost.**
  - **Order receipt and Entry:**
    - **After an acceptable price quote, the customer enters the order receipt and entry phase of OMC.**

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Mercantile Process Models

- **Mercantile Models - Merchant's Perspective**
  - **Order Selection and Prioritization:**
    - **Customer service representatives are also often responsible for choosing which orders to accept and which to decline. There is little recognition of the importance that should be placed on order selection and prioritization in e-commerce.**
  - **Order Scheduling:**
    - **During the ordering scheduling phase the prioritized orders get slotted into an actual production or operational sequence.**
  - **Order Fulfillment and Delivery:**
    - **During the order fulfillment and delivery phase the actual provision of the product or service is made. Often, order fulfillment involves multiple functions and locations.**

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Mercantile Process Models

- **Mercantile Models - Merchant's Perspective**
  - **Order Billing and Account/Payment Management:**
    - **After the order has been fulfilled and delivered billing is typically handled by the finance staff.**
  - **Postsales Service:**
    - **This phase plays an increasingly important role in all elements of a company's profit equation: Customer value, price and cost.**

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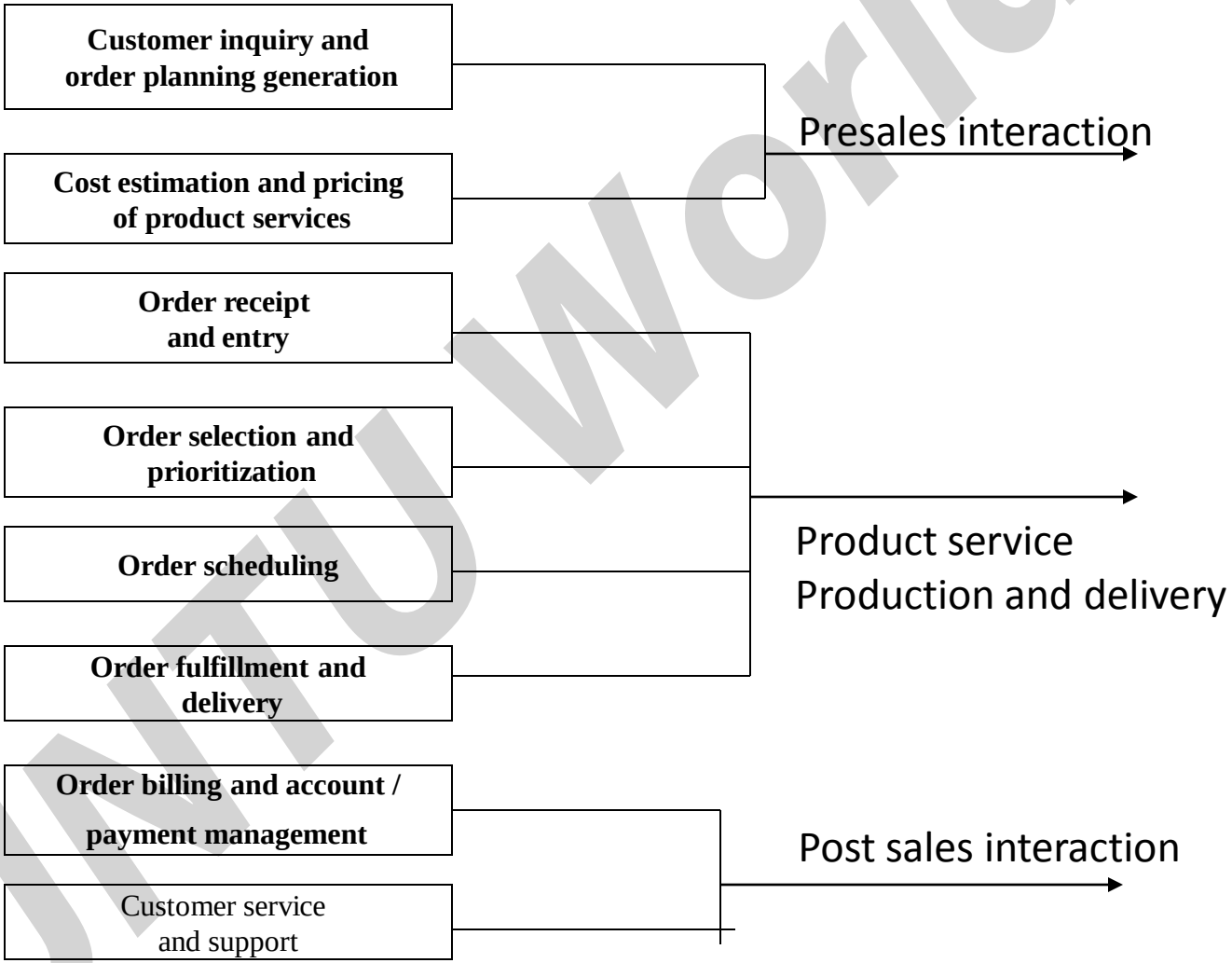
Mercantile Process Models



Order Management Cycle in e-commerce

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E-Commerce

UNIT- III

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Electronic Payment Systems

- **Electronic payment systems and e-commerce are intricately linked given that on-line consumers must pay for products and services.**
- **An important aspect of e-commerce is prompt and secure payment, clearing, and settlement of credit or debit claims. On-line sellers face a problem of paying for goods and services. What currency will serve as the medium of exchange in this new market place.**
- **Payment and settlement is a potential bottleneck in the fast-moving electronic commerce environment if one depends on conventional payment methods such as cash, checks, bank drafts, or bills of exchange.**
- **New methods of payment are needed to meet the emerging demands of e-commerce. These neo-payment instruments must be secure, have a low-processing cost, and be accepted widely as global currency tender.**

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Electronic Payment Systems

- **Electronic payment systems are getting used in banking, retail, health care, on-line markets and even government. The emerging electronic payment technology was labeled as Electronic Fund 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 to debit or credit an account". EFT utilizes computer and telecommunication components both to supply and to transfer money or financial assets.**

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Electronic Payment Systems

- **Work on EFT can be segmented into three broad categories:**
  - **Banking and Financial Systems:**
    - **Large scale or wholesale payments**
    - **(Ex: Bank – to- Bank Transfer)**
    - **Small scale or retail payments (Ex: ATM and Cash dispensers)**
    - **Home banking (Ex: Bill Payment)**
  - **Retailing Payments:**
    - **Credit Cards (Ex: VISA/Master Cards)**
    - **Private label Credit/debit cards (Ex: JcPenny Card)**
    - **Charge Cards (Ex: American Express)**

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Electronic Payment Systems

- **Work on EFT can be segmented into three broad categories:**
  - **On-line electronic Commerce Payments**
    - **Token based payment systems**
    - **Electronic Cash(Ex: Digicash)**
    - **Electronic Cheques ((Ex: Netcheque)**
    - **Smartcards or debit cards**
    - **Credit Card based payment systems**
      - » **Encrypted Credit Cards**
      - » **Third party authorization numbers**
- **Digital token-based electronic payment systems**
  - **Non of the banking or retailing payment methods are completely adequate in their present form for the consumer-oriented e-commerce environment. Their deficiency is their assumption that the parties will at some time or other be in each other's physical presence or that there will be a sufficient delay in the payment process for frauds, overdrafts, and other undesirables to be identified and corrected**

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Electronic Payment Systems

- **Digital token-based electronic payment systems**
  - **These assumptions may not hold for e-commerce and so many of these payment mechanisms are being modified and adapted for the conduct of business over networks. New forms of financial instruments are being developed like "electronic tokens" in the form of electronic cash / money or cheques. Electronic tokens are designed as electronic analogs of various forms of payment backed by a bank or financial institution. Electronic tokens are equivalent to cash that is backed by a bank**
  - **Electronic Tokens are of three types:**
    - **Cash or Real time: Transactions are settled with the exchange of electronic currency.**
    - **Debit or prepaid Card: Users pay in advance for the privilege of getting information.**
    - **Credit or postpaid: The server authenticates the customers and verifies with the bank that funds are adequate before purchase**

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Electronic Payment Systems

- **Dimensions that are used for analyzing the different initiatives:**
  - **The nature of the transaction for which the instrument is designed. The parties involved, the average amounts, and the purchase interaction are to be identified**
  - **The means of settlement used – tokens must be backed cash, credit, electronic bill payments etc.**
  - **Approach to security, anonymity and authentication – encryption can help with authentication and asset management**
  - **The question of risk – who assumes what kind of risk at what time? Risk arises if the transaction has long lag times between product delivery and payments to merchants.**

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Electronic Payment Systems

- **Electronic Cash**:
  - **Electronic Cash combines computerized convenience with security and privacy that improve on paper cash. E-cash focuses on replacing cash as the principal payment vehicle in consumer oriented electronic payments.**
  - **Properties of Electronic Cash:**
    - **E-cash must have the following four properties:**
      - **Monetary value – E-cash must be backed by either cash, bank authorized credit or a bank certified cashier's check.**
      - **Interoperability – E-cash must be exchangeable as payment for other e-cash, paper cash, goods or services, lines of credit, deposits in banking accounts, bank notes or obligations, electronic benefits, transfers and the like.**

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Electronic Payment Systems

- **Properties of Electronic Cash:**
  - **E-cash must have the following four properties:**
    - **Retreivability – E-cash must be storable and retrievable. Remote storage and retrieval would allow users to exchange e-cash from home or office or while travelling.**
    - **Security – E-cash should not be easy to copy or transfer with while being exchanged; this includes preventing or detecting duplication and double spending.**
- **Purchasing e-cash from currency servers**:
  - **Electronic cash is based on cryptographic systems called " digital signatures" which involves a pair of numeric keys that work in tandem: one for locking (encoding) and the other for unlocking (decoding). Messages encoded with one numeric key can only be decoded with the other numeric key**.

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Electronic Payment Systems

- **Purchasing e-cash from currency servers:**
  - **The purchase of e- cash from an on-line currency server involves two steps.**
    - **Establishment of an account and**
    - **Maintaining enough money in the account to back the purchase.**
  - **All customers must have an account with a central on-line bank**
  - **Consumers use the e-cash software on the computer to generate a random number, which serves as the "note". In exchange for money debited from the customer's account, the bank uses its private key to digitally sign the note for the amount requested and transmits the note back to the customer.**
  - **Electronic cash can be completely anonymous. Anonymity allows freedom of usage. When the e-cash software generates a note; it masks the original number or "blinds" the note using a random number and transmits it to a bank. The "blinding" carried out by the customer's software makes it impossible for anyone to link payment to payer.**

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Electronic Payment Systems

- **Purchasing e-cash from currency servers:**
  - **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 user can spend the digital money at any shop accepting e-cash, without having to open an account.**
- **Two types of transactions are possible:**
  - **Bilateral -Typically transactions involving cash are bilateral or two party transactions where by the merchant checks the veracity of the note's digital signatures by using the bank's public key.**
  - **Trilateral Transactions involving financial instruments other than cash are usually trilateral or three party transactions, where by the "notes" are sent to the merchant, who immediately sends them directly to the digital bank. The bank verifies the validity of these "notes" and that they have not been spent before.**

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Electronic Payment Systems

- **Drawback of e-cash is its inability to be easily divided into smaller amounts. Customers are issued a single number called an "open check" that contains multiple denomination values sufficient for transactions up to a pre-described limit. At payment time, the e-cash software on the client's computer would create a note of the transaction value from the "open check".**
- **Business Issues and Electronic Cash:**
  - **Electronic cash fulfils two main functions: as a medium of exchange and as a store of value.**
  - **Controversial aspects of e-cash are those that relate to the store of value. If e-cash had to be convertible into legal tender on demand, then for every unit there would have to be a unit of cash reserved in the real economy. This creates problems, because in an efficient system, if each e-cash unit represents a unit of real cash, then positive balances of e-cash will earn no interest.**

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Electronic Payment Systems

- **Business Issues and Electronic Cash:**
  - **Currency fluctuations in international finance pose another problem. Unless, we have one central bank offering one type of electronic currency, it is very difficult to see e-cash being very prominent except in narrow application domains.**
  - **If e-cash started to bypass regulated foreign exchange markets by developing its own grey market for settlement, then governments might be provoked into trying to clamp down on it.**
  - **Because of these obstacles, e-cash in its early forms may be denominated in single currencies and exchanged at conventional market rates.**

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Electronic Payment Systems

- **Operational Risk and Electronic Cash**:
  - **Operational risk associated with e-cash can be mitigated by imposing constraints such as limits on:**
    - **The time over which a given electronic money is valid**
    - **How much can be stored on and transferred by electronic money**
    - **Number of exchanges that can take place before a money needs to be redeposited with a bank or financial institution**
    - **The number of such transactions that can be made during a given period of time.**
    - **Exchanges could also be restricted to a class of services or goods.**
  - **The objective of imposing constraints is to limit the issuer's liability. A well designed system could enforce a policy involving both transactions size and value with time. Exchanges could also be restricted to a class of services or goods.**

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Electronic Payment Systems

- **Legal Issues and Electronic Cash:**
  - **Transaction based taxes account for a significant portion of state and local government's revenue. If e-cash really is made to function the way paper money does, payments could be made in this new forms of currency because there would be no problems of bulk and no risk of robbery. The threat to the government's revenue flow is a very real one, and officials in government are starting to take cognizance of this development and to prepare their responses.**
  - **Any thing that makes cash substantially easier to use in a broader range of transactions holds the potential to expand the underground economy to proportions posing even more serious threats to the existing legal order.**

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Electronic Payment Systems

- **Electronic Checks**:
  - **Electronic checks are another form of electronic tokens. They are designed to accommodate the many individuals and entities that might prefer to pay on credit or through some mechanism other than cash.**
  - **Buyers must register with a third party account server before they are able to write electronic checks. The accounts server also acts as a billing service. Once registered a buyer can then contact sellers of goods and services. To complete a transaction, the buyers send a check to the seller for a certain amount of money. When deposited, the check authorizes the transfer of account balances from the account against which the check was drawn to the account to which the check was deposited.**
  - **On receiving the check, the seller presents it to the accounting server for verification and payment. The accounting server verifies the digital signature on the check using the authentication scheme.**

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Electronic Payment Systems

- **Electronic Checks**:
  - **Electronic Checks have the following advantages:**
    - **They work in the same way as traditional checks, thus simplifying customer education.**
    - **Electronic checks are well suited for clearing micro payments.**
    - **Electronic checks create float and the availability of float is an important requirement for commerce.**
    - **Financial risk is assumed by the accounting server and may result in easier acceptance.**

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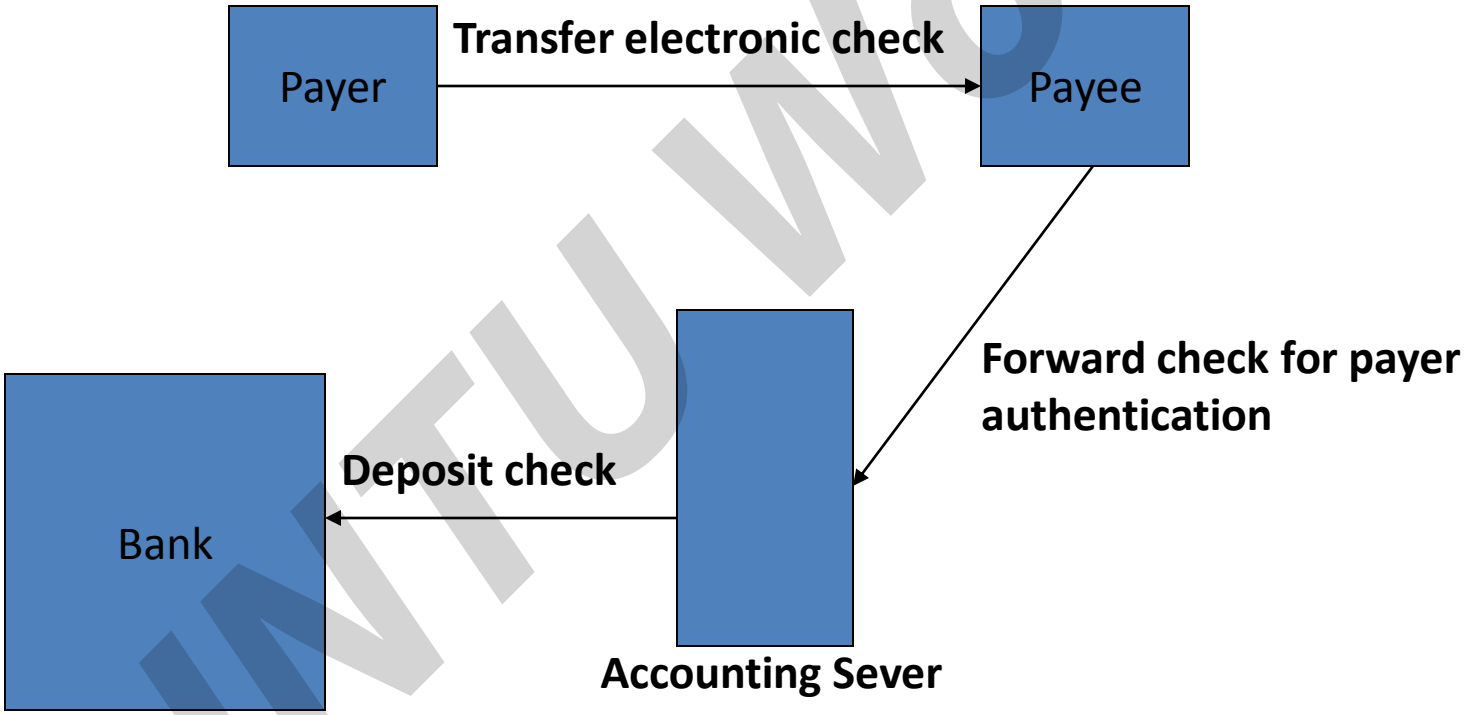
Electronic Payment Systems

- **Electronic Checks**:



Payment transaction sequence in an electronic check system

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Smart card payment Systems

- **Smart Cards and Electronic Payment Systems:**
  - **Smart Cards are credit and debit cards and other card products enhanced with microprocessors capable of holding more informant than the traditional magnetic stripe.**
  - **Smart card technology is widely used in countries such as France, Germany, Japan and Singapore to pay public phone calls, transportation and shopper loyalty programs.**
- **Smart cards are basically of two types:**
  - **Relationship based smart credit cards**
  - **Electronic purses also known as debit cards.**
- **Relationship based Smart Cards:**
  - **A relationship-based smart card is an enhancement of existing card services and/or the addition of new services that a financial institutions delivers to its customers via a chip based card or other devices.**

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Smart card payment Systems

- Relationship-based products offer the following:
  - Access to multiple accounts, such as debit, credit, investments or stored value for e-cash, on one card or an electronic device.
  - A variety of functions, such as cash access, bill payment, balance inquiry or funds transfer for selected accounts.
  - Multiple access options at multiple locations using multiple device types such as ATMs, personal computer, Personal Digital Assistant (PDA).

- **Electronic Purses and Debit Cards:**
  - "Electronic Purses" are wallet sized smart cards embedded with programmable microchips that store sums of money for people to use instead of cash. After the purse is loaded with money it can be used to pay for in a vending machine equipped with a card reader.
  - When the balance on an electronic purse is depleted, the purse can be recharged with more money.
  - For merchants, smart cards are a very convenient alternative to handling cash.

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Smart card payment Systems

- **Smart-card readers and smart phones**
  - **Benefits of smart cards will rely on the availability of devices called smart card readers that can communicate with the chip on a smart card. In addition to reading from and writing to smart cards, these devices can also support a variety of key management methods.**
  - **Card readers in the form of screen phones are becoming more prominent. The phone prompts users through transactions using menus patterned after those found on automated teller machines**
  - **Smart card readers can be customized for specific environments**
- **Business issues and smart cards**
  - **For merchants smart cards are a very convenient alternative to handling cash**
  - **Security of smart cards and their ability to authenticate themselves will make them useful for payments related to electronic commerce services**

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Credit card payment systems

- **Credit Card based Electronic Payment Systems:**
  - **To avoid the complexity associated with digital cash and electronic checks, consumers and vendors are looking at credit card payments on the Internet as one possible time-based alternative. If consumers want to purchase a product or service, they simply send their credit card details to the service provider involved and the credit card organization will handle this payment like any other**
  - **Credit Card Payment on on-line networks can be categorized as**
    - **Payments using plain credit card details: The easiest method of payment is the exchange of unencrypted credit cards over a public network such as telephone lines or the Internet.The low level of security inherent in the design of the Internet makes the method problematic. Authentication is also a significant problem.**

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Credit card payment systems

- Credit Card based Electronic Payment Systems:
  - Payments using encrypted credit card details: Though encryption of credit card makes sense the cost would prohibit low-value payments by adding costs to the transaction.
  - Payments using third party verification: One solution to security and verification problems in the introduction of a third party. A company that collects and approves payments from one client to another.

- Encryption and Credit Cards: To make a credit card transaction truly secure and non-refutable, the following sequence of steps must occur before actual goods, services or funds flow:
  - A customer presents his or her credit card information securely to the merchant.
  - The merchant validates the customer's identity as the owner of the credit card account.
  - The merchant relays the credit card charge information and signature to its bank or on-line credit card processors.

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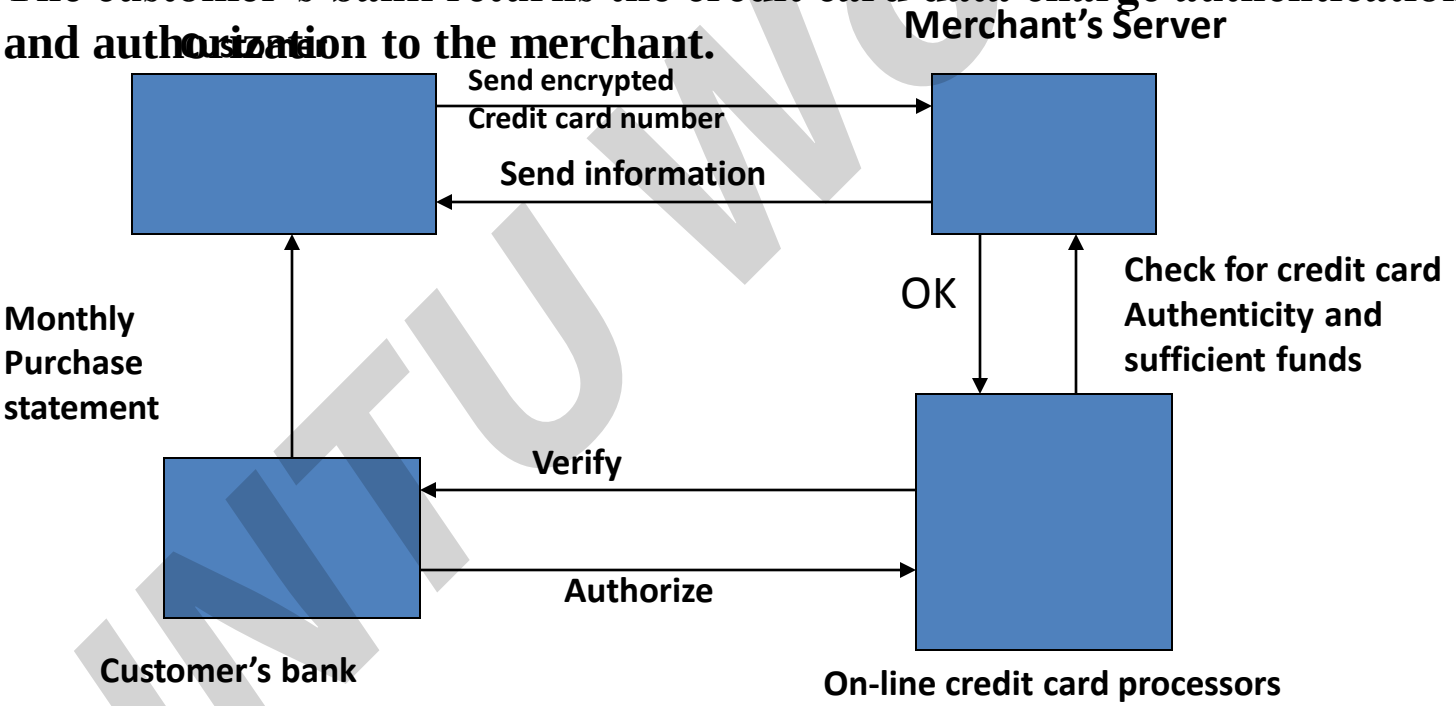
Credit card payment systems

- The bank or processing party relays the information to the customer's bank for authorization approval.
- The customer's bank returns the credit card data charge authentication and authorization to the merchant.



Processing payments using encrypted credit cards

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Credit card payment systems

- **Third-party processors and credit cards**
- **In third party processing, consumers register with a third party on the Internet to verify electronic microtransaction. On-line third party (OTTP) have created a process that they believe will be a fast and efficient way to buy information on-line**
  - **The consumer acquires an OTTP account number by filling out a registration form.**
  - **To purchase an article on-line, the consumer requests the item form the merchant by quoting the OTTP account number**
  - **The merchant contacts the OTTP payment server with the customer's account number**
  - **The OTTP payment server verifies the customer's account number for the vendor and checks for sufficient funds**
  - **The OTTP payment server sends an electronic message to the buyer.**

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Credit card payment systems

- **Third-party processors and credit cards**
  - **If the OTTP payment server gets a Yes from the customer, the merchant is informed and the customer is allowed to get the material**
  - **The OTTP will not debit the buyer's account until it receives confirmation of purchase completion**
- **<u>Pros and Cons of Credit Card based payment</u>:**
  - **Credit cards have advantages over checks in that the credit card company assumes a larger share of financial risk for both buyer and seller in a transaction.**
  - **Record keeping with credit cards is one of the features consumers value most because of disputes and mistakes in billing**
  - **Disadvantage to credit cards is that their transaction are not anonymous, and credit card companies do in fact compile valuable data about spending habits.**
  - **The complexity of credit and processing takes place in the verification, a potential bottleneck.**
  - **Encryption and transaction speed must be balanced. On-line credit card users must find the process to be acceptable simple and fast.**

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Risk in Electronic Payment system

- **Risk and Electronic Payment Systems**:
- **Operation of the payment systems incurs three major risks.**
  - » **Fraud or mistake**
  - » **Privacy Issues**
  - » **Credit Risk**
- **Risks from Mistake and Disputes:**
  - **All electronic payments systems need some ability to keep automatic records. Features of these automatic records include**
    - » **Permanent storage**
    - » **Accessibility and traceability**
    - » **A payment system database**
    - » **Data transfer to payment maker, bank or monetary authorities**
- **Anonymity is an issue that will have to be addressed through regulation covering consumer protection in electronic transactions.**

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Risk in Electronic Payment system

- **Managing Information Privacy:**
  - **The electronic payment system must ensure and maintain privacy. Privacy must be maintained against eavesdroppers on the network and against unauthorized insiders. For many types of transactions, trusted third party agents will be needed to vouch for the authenticity and good faith of the involved parties.**
- **Managing Credit Risk: Credit or systemic risk is a major concern in net settlement systems because a bank's failure to settle its net position could lead to a chain reaction of bank failures.**
- **A digital central bank guarantee on settlement removes the insolvency test from the system because banks will move readily assume credit risks from other banks. Without such guarantees the development of clearing and settlement systems and money markets may be impeded**

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Design of Electronic Payment system

- **Designing Electronic Payment Systems:** The following factors must be addressed before any new payment method can be successful.
  - **Privacy**: A user expects to trust in a secure system
  - **Security**: A secure system verifies the identity of two party transactions through "user Authentication" and reserves flexibility to restrict information/services through access control.
  - **Initiative Interface**: The payment interface must be an easy to use as a telephone.
  - **Database Integration**: Banks should integrate all databases together and to allow customers access to any of them while keeping the data up-to-data and error free.
  - **Brokers:** A "network banker" must be in place.
  - **Pricing:** Pricing should be affordable by the consumer and it must be recognized that without subsidies it is difficult to price all services affordably.
  - **Standards**: Without standards, the welding of different payment users into different networks and different systems is impossible.

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E-Commerce

UNIT- IV

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Electronic Data Interchange (EDI)

- **EDI developed as a means of accelerating the movement of documents pertaining to shipments and transportation. Its use is growing and it is set to become the standard by which organizations will communicate formally with each other in the world of electronic commerce**
- **EDI is a structured document interchange which enables data in the form of document content to be exchanged between software applications that are working together to process a business transaction**
- **EDI techniques are aimed at improving the interchange of information between trading partners, suppliers, and customers by bringing down the boundaries that restrict how they interact and do business with each other.**
- **EDI is aimed at forging boundaryless relationships**

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Electronic Data Interchange (EDI)

- **Definition**
  - **Electronic data interchange is the transmission, in a standard syntax, of unambiguous information of business or strategic significance between computers of independent organizations**
  - **Electronic data interchange is the interchange of standard formatted data between computer application systems of trading partners with minimal manual intervention**
  - **EDI is the electronic transfer, from computer to computer, of commercial and administrative data using an agreed standard to structure an EDI message**
  - **EDI is the electronic transfer from one computer to another of computer processable data using an agreed standard to structure the data**

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EDI Architecture

- **EDI architecture specifies four layers: Semantic layer, the standards translation layer, the transport layer, and the physical network infrastructure layer**

EDI Semantic Layer	**Application level services**
EDI Standard Layer	**EDIFACT business form Standards** **ANSI X12 business form standards**
EDI transport layer	**Electronic Mail -X.435, MIME (Multipurpose Internet Mail Extensions)** **Point to Point -FTP, TELNET** **World Wide Web – HTTP**
Physical Layer	**Dial Up Lines, Internet , I-Way**

Layered Architecture of EDI

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EDI Architecture

- **EDI architecture layers:**
  - **The semantic (or application layer) describes the business application that is driving EDI. For a procurement application, this translates into requests for quotes, price quotes, purchase orders, acknowledgements and invoices. This layer is specific to a company and the software it uses**
  - **The information seen at the EDI semantic layer must be translated from a company-specific form to a more generic or universal form so that it can be sent to various trading partners, who could be using a variety of software applications at their end. Two standards are generally followed - X12 standard developed by American National Standards Institute (ANSI) and EDIFACT, developed by United Nations Economic Commission**

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EDI Architecture

- **EDI architecture layers:**
  - **The packing (or transport) layer corresponds with the non-electronic activity of sending a business form from one company A to company B. EDI documents are exchanged using e-mail programs and network infrastructure. EDI documents are more structured than e-mail and typically are processed by the sending and receiving software**
  - **The Physical infrastructure layer consisting of Dial-up lines, Internet etc enable for the transmission of the message**

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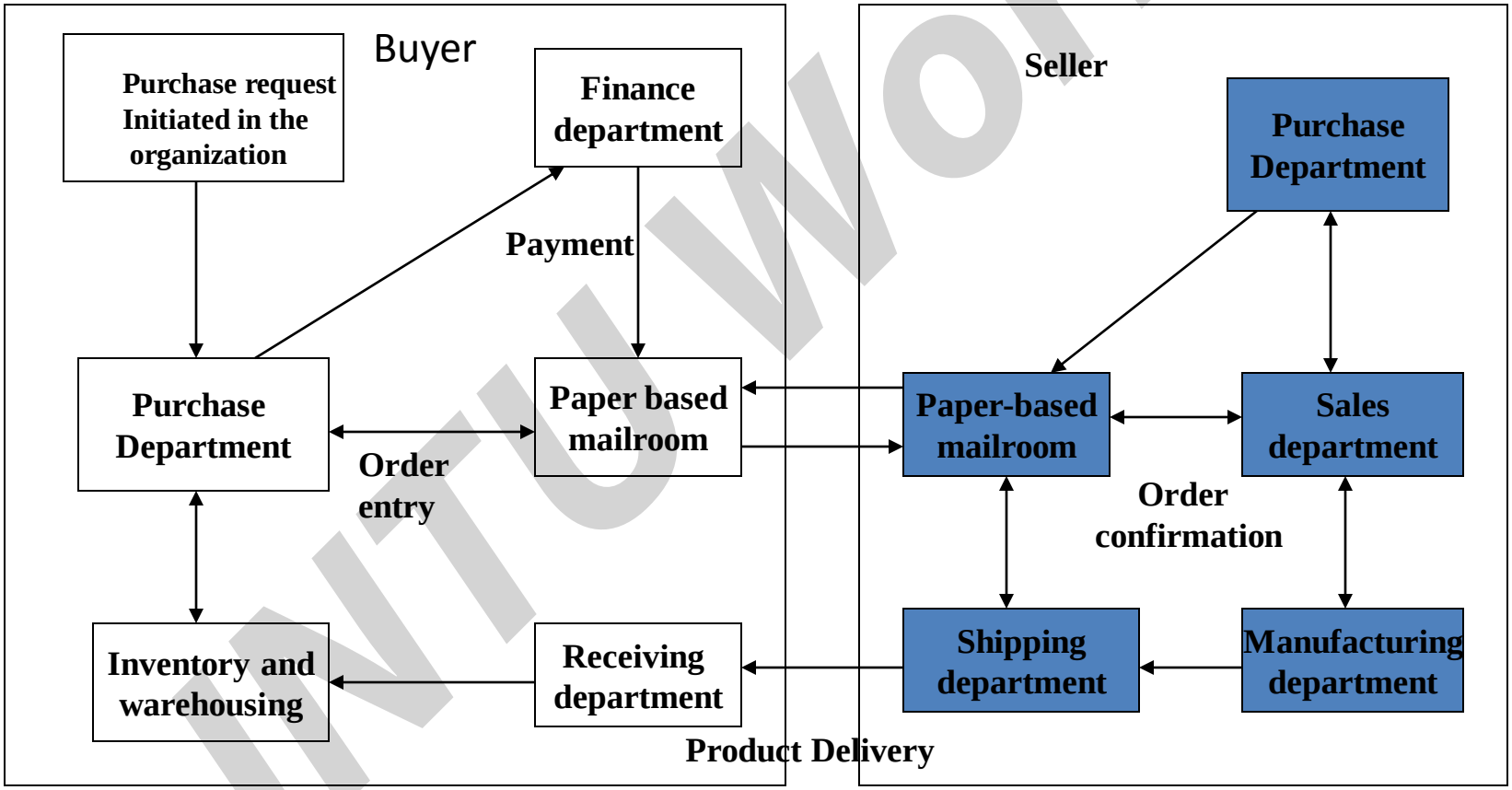
EDI Architecture



Information flow without EDI

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EDI Architecture

- **Information flow without EDI**
  - **When the buyer sends a purchase order to a seller, the relevant data must be extracted from the internal database and recorded on hard copy. This hard copy is then forwarded to the seller after passing through several intermediate steps**
  - **Sellers receive information in the form of letters and in some cases a vast number of facsimiles**
  - **This information is manually entered into the internal information systems of the recipient by data entry operators. This process generates a considerable amount of overhead in labor costs and time delays. The reproduction of information also increase the risk of errors caused by incorrect data entries**
  - **This practice of converting digital data into hard copy data that is reconverted into electronic information again on the receiving end generates unnecessary costs.**

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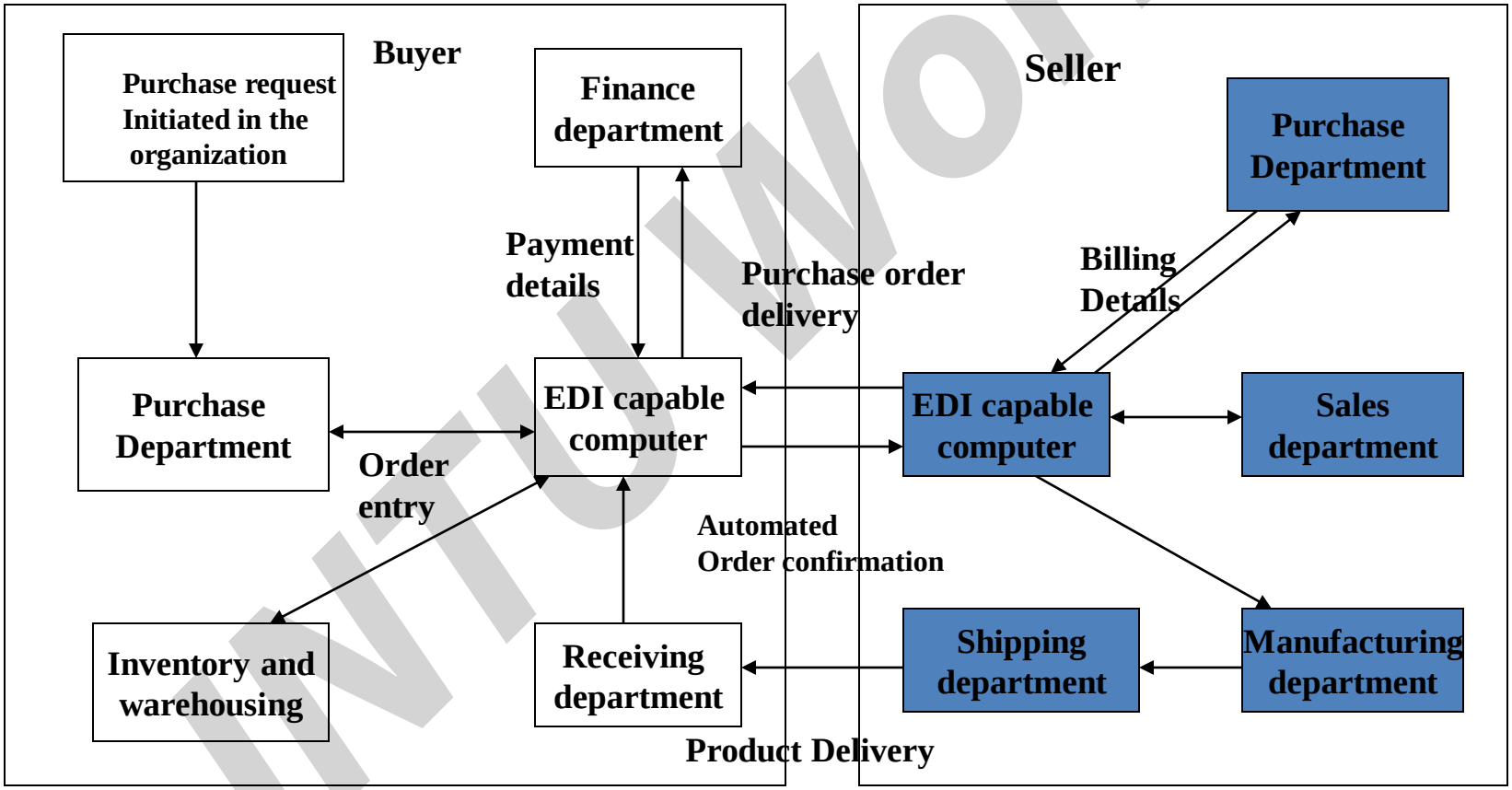
EDI Architecture



Information flow with EDI

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EDI Architecture

- **Information flow with EDI**
  - **Buyer's computer sends Purchase Order to seller's computer**
  - **Seller's computer sends Purchase order confirmation to buyer's computer**
  - **Seller's computer sends Booking Request to transport company's computer**
  - **Transport company's computer sends Booking Confirmation to seller's computer**
  - **Seller's computer sends Advance Ship Notice to buyer's computer**
  - **Transport company's computer sends Status to seller's computer**
  - **Buyer's computer sends Receipt Advice to seller's computer**
  - **Seller's computer sends Invoice to buyer's computer**
  - **Buyer's computer sends Payment to seller's computer**
- **All the interactions occur through EDI forms and in most cases are generated automatically by the computer**

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Tangible Benefits of EDI

- **Tangible Benefits of EDI**
  - **EDI can be at cost-and time saving system. The automatic transfer of information from computer to computer reduces the need to rekey information and as such costly errors to near zero.**
  - **Reduced paper-based systems – EDI can impact the effort and expense a company devotes to maintaining records, paper-related supplies, filing cabinets, or other storage systems and to the personnel required to maintain all of these systems**
  - **Improved problem resolution and customer service.- EDI can minimize the time companies spend to identify and resolve inter-business problems**
  - **Expanded customer / supplier base – Many large manufacturers and retailers with the necessary clout are ordering their suppliers to institute an EDI program**

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EDI Applications in Business

- **International Trade**
  - **Benefits for international trade are**
    - **Reduced transaction expenditures**
    - **Quicker movement of imported and exported goods**
    - **Improved customer service through "track and trace" programs which locate the things or being handled**
    - **Faster customer clearance and reduced opportunities for corruption**
- **Financial EDI**
    - **Comprises the electronic transmission of payments and remittance information between a payer, payee and their respective banks**
  - **Types of Financial EDI**
    - **Bank Cheques**
    - **Interbank Electronic Funds Transfer (EFT) which are credit transfers between banks where funds flow directly from the payer's bank to the payee's bank**

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EDI Applications in Business

- Automated clearing (ACH) transfers which provides for
  - Fast transmission of information about their financial balances throughout the world
  - The movement of money internationally at rapid speed for settlement of debit/credit balances
  - Examples
    - » BankWire a network owned by banks in over 200 American cities
    - » FedWire funds transfer system in US
    - » CHIPS (Clearing House Interbank Payments System) processes 90 percent of all international dollar transfers made
    - » SWIFT (Society for Worldwide Interbank Financial Telecommunications) which is a leader in providing standard EDI formats for funds –transfer instructions and administrative messages

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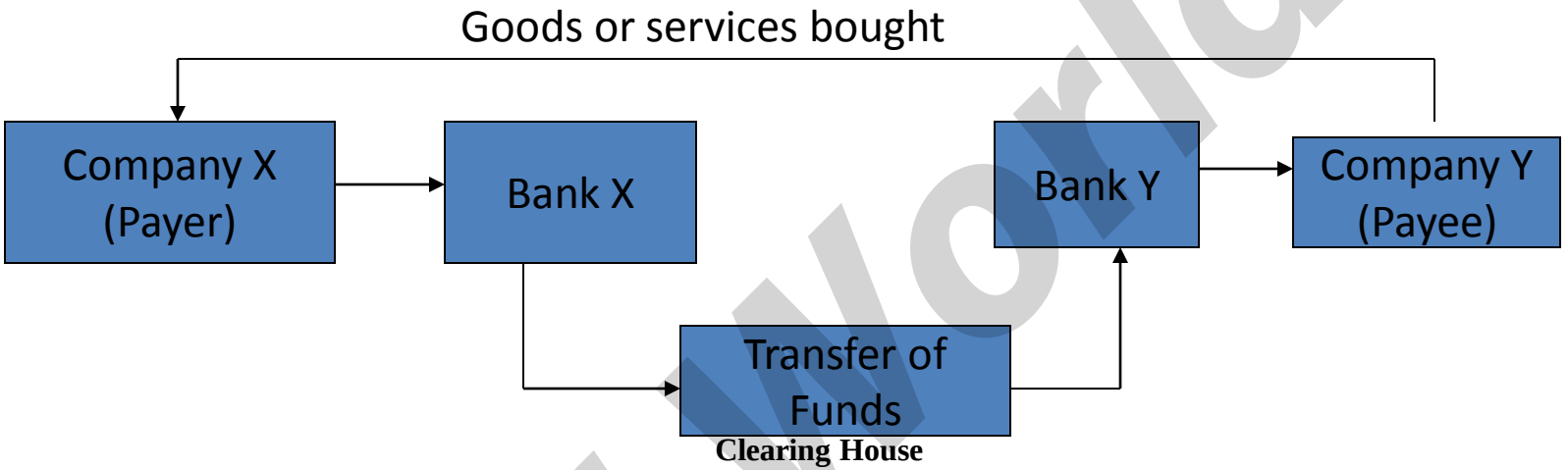
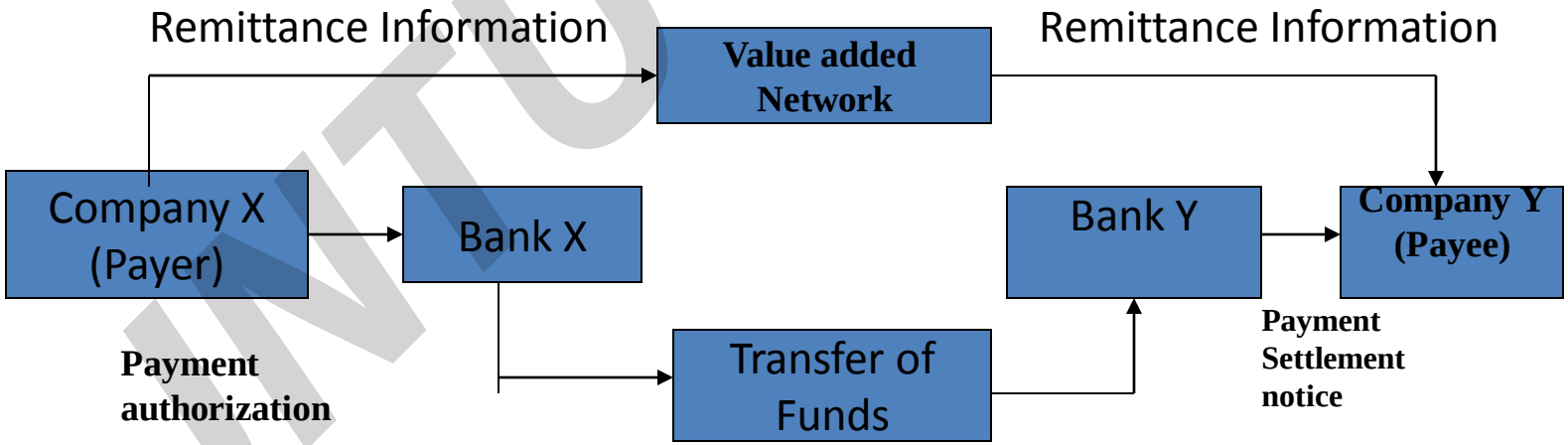
EDI Applications in Business



Payment and remittance information flowing together



Payment and remittance information flowing separately

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EDI Applications in Business

- **Health care and Insurance EDI**
  - **Medical providers, patients, and payers increasingly process claims via electronic networks. Electronic claim processing reduces the administrative costs of health care. EDI enables doctors to communicate with other physicians, laboratories, hospitals, and other health care settings leading to better managed care**
- **Manufacturing/Retail procurement Using EDI**
  - **In manufacturing, EDI is used to support just-in-time**
    - **Companies using JIT and EDI no longer stock thousands of large parts in advance of their use. Instead they calculate how many parts are needed each day based on the production schedule and electronically transmit orders and schedules to suppliers every day. Parts are delivered to the plant "just in time" for production activity**

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EDI Applications in Business

- **Manufacturing/Retail procurement Using EDI**
  - **In retailing EDI is used to support quick response**
    - **Retailers are redefining practices through the entire supply chain using quick response systems. For the customers, QR means better service and availability of a wider range of products.**
- **Business Information, Product design and procurement**
  - **The development of global sourcing has been closely intertwined with the rapid evolution of business information. Business information is defined in the broad sense as all information required by enterprises for the efficient planning, execution, and monitoring of product manufacturing and marketing. This includes not only raw data, but also product data for design and engineering.**

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EDI standards

- **Two major EDI standards exist – ANSI X.12 and EDIFACT**
  - **ANSI X.12 committee develops standards to facilitate EDI relating to such business transactions as order placement and processing for products and services. The transaction sets generally map a traditional paper document to an electronic format that can move easily over a telecommunication network e.g. Form 838 Vendor Registration, 840 Request for quotation, 843 Response to request for quotation, 850 Purchase Order etc.**
  - **EDIFACT was based on TRADECOMS developed by the UK Department of Customs and Excise. It is becoming widely accepted as the EDI standard**
- **Structure of EDI transaction**
  - **Transaction Set which is equivalent to a business document such as a purchase order. Each transaction set is made up of data segments**
  - **Data segments are logical groups of data elements that together convey information, such as invoice terms, shipping information, or purchase order line**
  - **Data elements are individual fields, such as purchase order number , quantify on order, unit price**

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EDI Implementation

- **Basic kit necessary for EDI implementation includes**
  - **Common EDI standards which specify transaction sets – complete sets of business documents (invoice, purchase order, remittance advice etc)**
  - **Translation Software sends messages between trading partners, integrates data into and from existing computer applications, and translates among EDI standards**
  - **Trading partners are a firm's customers and suppliers with whom business is conducted**
  - **Banks facilitate payment and remittance**
  - **EDI value-added network services (VAN) which manages data communications networks for businesses that exchange electronic data with other businesses**
  - **Proprietary hardware and networking – very large companies very active in EDI, that facilitate their business partners' use of EDI.**

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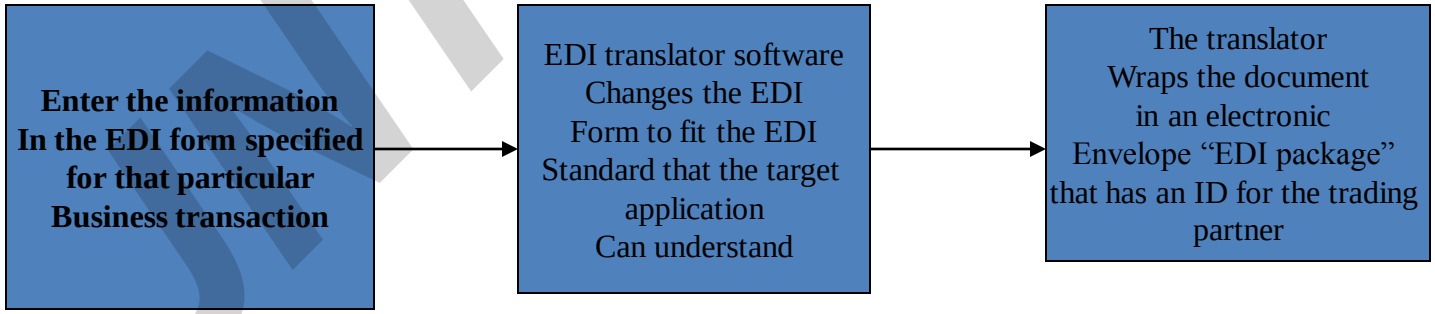
EDI Implementation

- **EDI Software Implementation**
  - **EDI software has four layers – business application, internal format conversion, EDI translator, and EDI envelope for document messaging**
  - **EDI Business Application Layer**
    - **The first step in the EDI process creates a document in a software application. The software application then sends the document to an EDI translator, which automatically reformats the document into the agreed-on EDI standard. The translator creates and wraps the document in an electronic envelope "EDI package" that has a mailbox ID for the company's trading partner. The EDI wrapper software can be a module to the translator, a programming tool to write to different communications protocols, or a separate application.**



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EDI Implementation

- **EDI Software Implementation**
  - **EDI Translator Layer**
    - **Translators describe the relationship between the data elements in the business application and the EDI standards**
    - **The translator ensures that the data are converted into a format that the trading partner can use.**
  - **EDI Communication Layer**
    - **The communication part dials the phone number for the value-added network service provider or other type of access method being used.**
    - **On the receiving end, the trading partner's modem call the network and retrieves the information**
  - **Implementation Cost**
    - **Expected volume of electronic documents**
    - **Economics of the EDI translation software**
    - **Implementation time**

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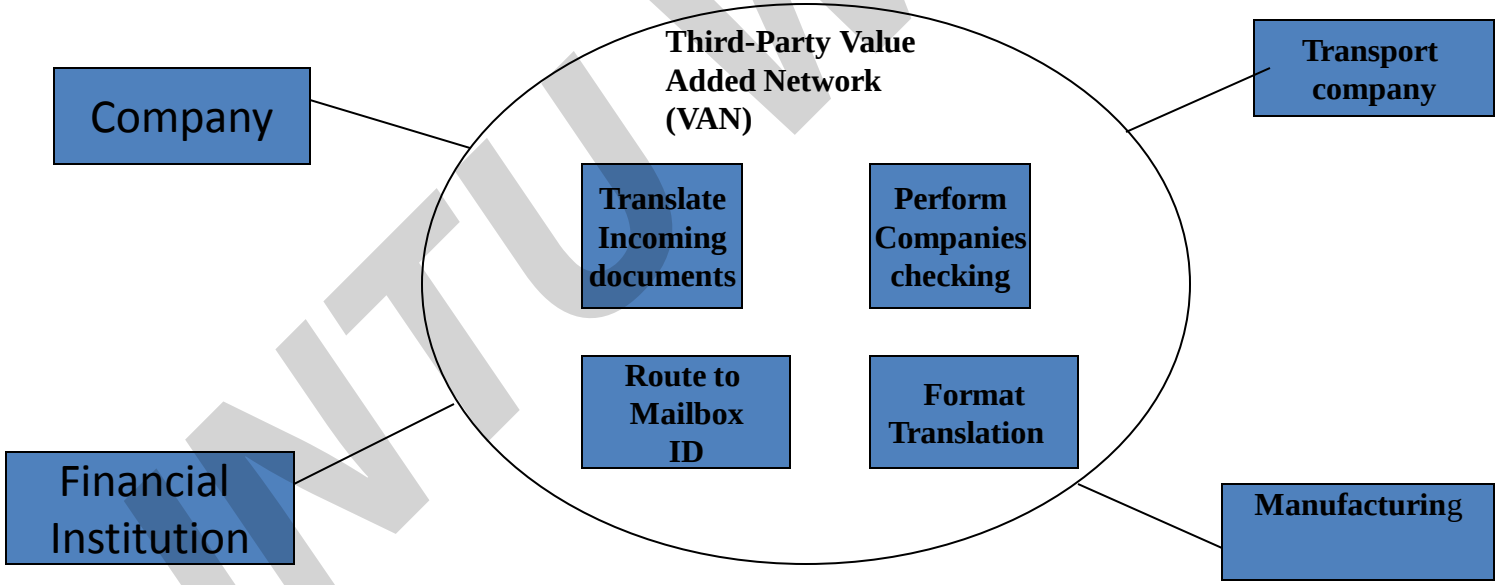
Value Added Networks

- **Value-Added Networks (VANs)**
  - **A VAN is a communications network that typically exchanges EDI messages among trading partners. It also provides other services, including holding messages in "electronic mailboxes", interfacing with other VANs, and supporting many telecommunications modes and transfer protocols.**



Functions of a third-party VAN

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EDI standards

- **Value-Added Networks (VANs)**
  - **Company A puts an EDI message for trading partner manufacturing company B in the VAN mailbox at a date and time of its choosing. The VAN picks up the message from the mailbox and delivers it to trading partner B's mailbox, where it will remain until trading partner B logs on and picks it up. Trading partner B responds to trading partner A in the same fashion. The cycle repeats itself on a weekly, daily, or perhaps even hourly basis as needed. This service is generally referred to as mail-enabled EDI.**
  - **Disadvantage of EDI-enabling VANs is that they are slow and high-priced, charging by the number of characters transmitted**
  - **VAN Pricing Structure**
    - **VAN services entail three types of costs:**
      - **Account Start-up costs**
      - **VAN Usage costs**
      - **VAN interconnect costs**

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EDI standards

- **Internet based EDI**
  - **Factors that make the Internet useful for EDI**
    - **Flat-pricing – It is not dependent on the amount of information transferred. It is better for the customer as opposed to the standard VAN approach of charges per character**
    - **Cheap access with the low cost of connection**
    - **Common mail standards and proven networking and interoperable systems**
    - **Security – public-key encryption techniques are being incorporated in various electronic mail systems**
- **Electronic commerce services on the Internet differ from value added network offerings. They are based on established technologies and applications available from independent vendors, where as more traditional services are based on proprietary software and front ends.**
- **The Internet can be used directly for exchanging EDI messages without going through a VAN.**

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EDI standards

- **EDI Gateways**
  - **EDI gateways are being built that act as communication hubs between different sections of the same organization or with outside trading partners**
  - **Common Gateway facilities are**
    - **EDI message construction and translation**
    - **Translation between application software package standards and some agreed-on in-house standard**
    - **Translation between the in-house standard and the various EDI document formats**
    - **Queue management for both inbound and outbound documents**
    - **Compliance checking of arriving messages to ensure correctness**
    - **Session management and directory services maintenance**
    - **Full delivery audit facilities**
    - **Security and management features**
    - **Call-logging facilities designed to enable operation of a service desk**
    - **The creation of trading partner relationships and the establishement of trading partner profiles**

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Legal, Security and Privacy Issues

- **Messaging systems combine features of instantaneous and delayed communications. A message's delay is a function of the specific application, message routing, network(s) traversed, system configuration, and other technical factors typically unknown to the user.**
- **In case of EDI the courts haven't decided who is liable if an EDI network fails to transmit a document or transmits a document to the wrong party. There is no legal precedence in this area**
- **Digital Signatures and EDI**
  - **Cryptographic community is exploring various technical users of digital signatures by which messages might be time-stamped or digitally notarized to establish dates and times at which a recipient might claim to have had access or even read a particular message. `**

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Advantages of EDI

- **Improvement in overall quality – By better record keeping, fewer errors in data, reduction in processing time, less reliance on human interpretation of data, minimized unproductive time**
- **Inventory reduction – it permits faster and more accurate filling of orders, helps reduce inventory, assists in JIT inventory management**
- **Provides better information for management decision making. It provides accurate information and audit trails for transactions, enabling business to identify areas offering the greatest potential for efficiency improvement or cost reduction**
- **Saves time and manpower by avoiding the need to re-key data**
- **Eliminates the errors introduced by reentry**
- **Data arrives much faster than it could be by mail, and there is an automatic acknowledgement**
- **Imposes a fairly strict discipline on its users**

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Limitations of EDI

- **High Costs – Applications cost high to develop and operate. New entrants find this more difficult to have EDI**
- **Limited accessibility – It does not allow consumers to communicate or transact with vendors in an easy way. A subscriber must subscribe to an online service called VAN**
- **Rigid requirements – Needs highly structured protocols, previously established**
- **EDI applications automate only certain portion of the transactions**
- **Applications are narrow in scope**

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Disadvantages of EDI

- **Since EDI is a structured way of working, companies usually change operating procedures**
- **Responsibility may have changed during the introduction of EDI system. Unless this system and the links with other systems are managed well, it is not possible for the data processing department to become involved in production and purchasing decisions**
- **Less transparent than paper based systems**
- **Certain EDI systems are highly in-flexible, others are very simple to implement**
- **Users have developed systems to take advantage of the FAX machine which may avoid portal delays. Acknowledgement could be received through FAX**
- **Security of the operation is questionable. Are there standards for the type of operation we envisage, what happens when telephone lines or computers fail? How can the backup systems work?**

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E-Commerce

UNIT- 5

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Intra-organizational Electronic Commerce

- **Electronic commerce cannot be fully utilized if it addresses customer-organization interorganizational, or disconnected internal automation activities. For companies to be fully effective, these three activities must be integrated and the corresponding software applications developed together.**
- **Public commerce built on foundation of World Wide Web and other technologies over which firms, suppliers, and consumers engage in on-line transactions. The technologies and methods associated with electronic commerce are used extensively within firms, like enterprise integration, process control system, business process reengineering, and work-flow management**
- **Internal commerce uses methods and technologies for supporting internal business processes between individuals, departments, and collaborating organizations**
- **Private commerce is related to market orientation toward creating superior value for customers.**

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Intra-organizational Electronic Commerce

- **Business has to consistently deliver superior value to its customers through better coordination and work-flow management, product and service customization and supply chain management**
- **Work-flow management concerns with methods to optimize work flows by pruning unneeded operational steps and moving much of their internal paper handling onto computer networks.**
- **Product or service customization focuses on two issues: time-to-market and flexible operations. Time-to-market depends largely on gathering the specific consumer preferences and using these preferences to custom design products or services. Flexible operations depend largely on implementation details or working practices that make time-to-market a reality.**
- **Supply chain is the network of suppliers and customers within which any business operates. Supply chain management is important as it is impossible for companies to compete at the business or industrial level as isolated entities.**

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Work-flow automation and coordination

- A workflow provides the movement of a business process and its associated tasks among workers and the operations required to process relevant information as it moves from initiation to completion.
- Work-flows are decomposed into steps or tasks, which are then ordered to determine which should be done first, second, and so on. A simple workflows typically involve one or two tasks. A complex work flow may involve several other work flows, some of may execute simultaneously
- Organizational integration is complex and typically involve
  - Improving existing processes by utilizing technology where appropriate
  - Integrating across the business functions after identifying the information needs for each process
  - Integrating business functions, application program interfaces, and databases across departments and groups.

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Work-flow automation and coordination

- **Work-flow coordination**
  - **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**
- **Work-flow-related technology**
  - **Work-flow software electronically supports real-world collaborative activity. Work can be routed in ways that correspond to interoffice communications, in sequential routes, alternative routes, routes with feedback loops, circular routes, and more. Work-flow package lets users specify acceptance criteria for moving work from one stage to the next. Work-flow brings the information to the people who can act on it. It can coordinate existing software and track processes to make sure the work gets done by the right people**

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Supply Chain Management (SCM)

- **Supply chain management is an integrating process based on the flawless delivery of basic and customized services.**
- **SCM optimizes information and product flows from the receipt of the order, to purchase of raw materials, to delivery and consumption of finished goods.**
- **SCM plays an important role in the management of processes that cut across functional and departmental boundaries**
- **SCM is important in retailing because it helps manage the demand and supply functions.**
- **Supply Chain management has the following characters**
  - **An ability to source raw material or finished goods from anywhere in the world**
  - **A centralized, global business and management strategy with flawless local execution**
  - **On-line real-time distributed information processing to the desktop, providing total supply chain management visibility**

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Supply Chain Management (SCM)

- **Supply Chain management has the following characters**
  - **The ability to manage information not only within a company but across industries and enterprises**
  - **The seamless integration of all supply chain processes and measurements, including third-party suppliers, information systems, cost accounting standards, and measurement system**
  - **The development and implementation of accounting models such as activity-based costing that link cost to performance are used as tools for cost reduction**
  - **A reconfiguration of the supply chain organization into high-performance teams going from the shop floor to senior management**

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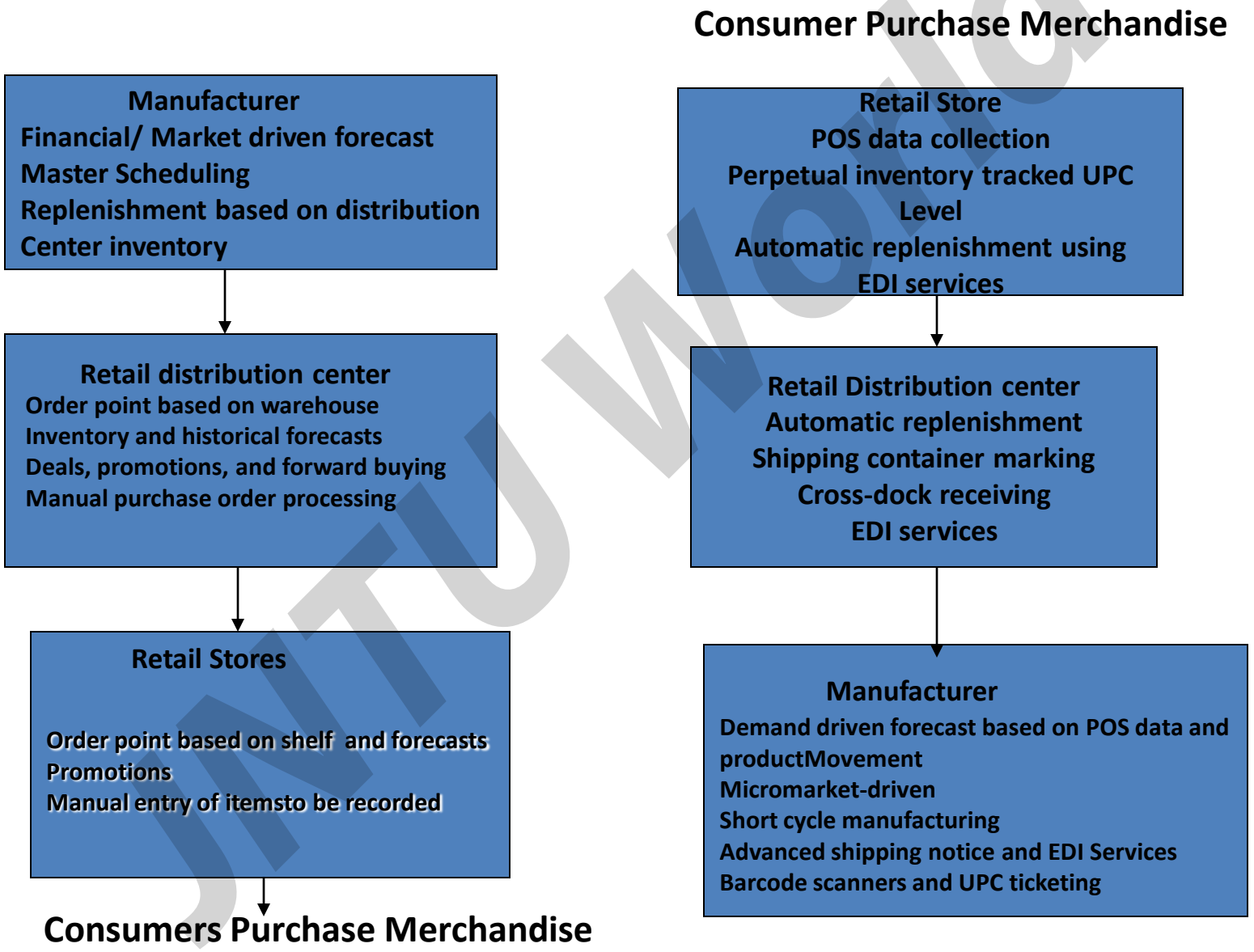
Push-based vs pull based SCM

- 

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Supply Chain Management (SCM)

- **The model contain three primary elements**
  - **Integrated Logistics and distribution**
    - **Deals with the integration of materials management and physical distribution. Logistics applies to the coordination and handling of all aspects of the movement of raw materials, components, semifinished goods, and finished goods. When products are manufactured, the logistics function is involved in getting them to the customer. Components of logistics will include handling the movement of raw materials and goods for resale, warehousing, customs brokerage, and distribution to a final destination**

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Supply Chain Management (SCM)

- **The model contain three primary elements**
  - **Integrated marketing and distribution**
    - **Deals with integrating customer directly and react to changes in demand by modifying the supply chain. Marketing must define the way a company does business. Technology is changing firms' marketing edge in the areas of manufacturing and logistics planning, in management analysis of new markets, in identifying and targeting customers, in promotion of the allied areas of direct marketing and telemarketing and in postsales through on-line customer service. This is achieved by efficient customer response systems**

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Supply Chain Management (SCM)

- **Efficient Customer Response (ECR)**
  - **ECR is expected to reduce costs by reforming the retail industry's buying habits and moving toward continuous product replenishment to get inventory into the stores faster. ECR uses the data-architecture developed to make transaction-level data from point-of-sale systems useful and legible to front-office buyers, logistics personnel, and senior managers. Effective inventory management – having just the right amount of the right merchandise on the shelves for just the right amount of time – minimizes overstocking and boosts profitability**
  - **Buyers and inventory analysts can look on-line and see how sales of products peak and trough over a season or how they vary across regions or stores**

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Supply Chain Management (SCM)

- **Efficient Customer Response (ECR)**
  - **Better in-house systems enable managers and buyers to do things like analyzing the performance of standard and trend items in stores, spot on a daily basis, upswings and downturns in the performance of trend merchandise, and replenish or authorize markdowns for trend items as necessary**
  - **Detailed analysis of item performance, what-if scenario evaluation, and exception reporting and handling**

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Supply Chain Management (SCM)

- **Agile Manufacturing**
  - **Agile manufacturing calls for flexibility and quick response to changing market conditions, customer demands, and competitor actions.**
  - **Agility implies breaking out the mass-production mold and producing highly customized products – when and where the customer wants them.**
  - **Agility includes such concepts as rapid formation of multicompany alliances to introduce new products to the market**

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Supply Chain Management (SCM)

- **Agile Manufacturing**
  - **Agility requires**
    - **Customers electronically transmitting their requirements to remote locations capable of quickly manufacturing and distributing these products**
    - **Companies rapidly form alliances to produce new products, employing advanced manufacturing concepts**
    - **Small and medium-sized companies advertise their manufacturing capabilities over computer networks and efficiently bid on projects required by other companies**

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Supply Chain Management (SCM)

- **Agile Manufacturing**
  - **Agility requires**
    - **"Software system brokers" connect users who need temporary access to sophisticated manufacturing tools**
    - **Manufactures and suppliers use " intelligent" procurement systems to facilitate and speed parts procurement, billing and payment transactions, reducing costs, improving accuracy, and meeting customer demands in a timely manner**

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Supply Chain Management (SCM)

- **Agile Manufacturing**
  - **Agile manufacturing enterprise aim to achieve**
    - **Greater product customization or manufacturing to order, would come at relatively low unit cost**
    - **Rapid introduction of new or modified products**
    - **Interactive customer relationships transform the physical production into a platform for providing an evolving set of value-adding services**
    - **Dynamic reconfiguration of production processes would accommodate swift changes in product designs or entire new product lines**

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E-Commerce

UNIT- VI

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Unit-VI Topics

- Corporate Digital Library – Document Library, Digital Documents
- Corporate Data Warehouses
- Advertising and Marketing
  - Information based marketing
  - Advertising on Internet
  - On-line Marketing Process
  - Market Research

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Corporate Digital Library

- Internal Commerce system is the effective utilization of information and data. The information is often scattered around the organization and stored in machines, places, and formats not easily accessible and often requiring lot of expertise to even get to them. This will impact the productivity of the corporation
- To rectify this problem, the field of corporate digital library is emerging around Internet and distributed networking
- Documents are becoming increasingly digital and the problem of managing documents becomes very important. Document management describes a variety of functions including document authoring and scanning, repository archiving, document distribution and delivery, document processing along the work flow, information search and retrieval and document browsing or viewing

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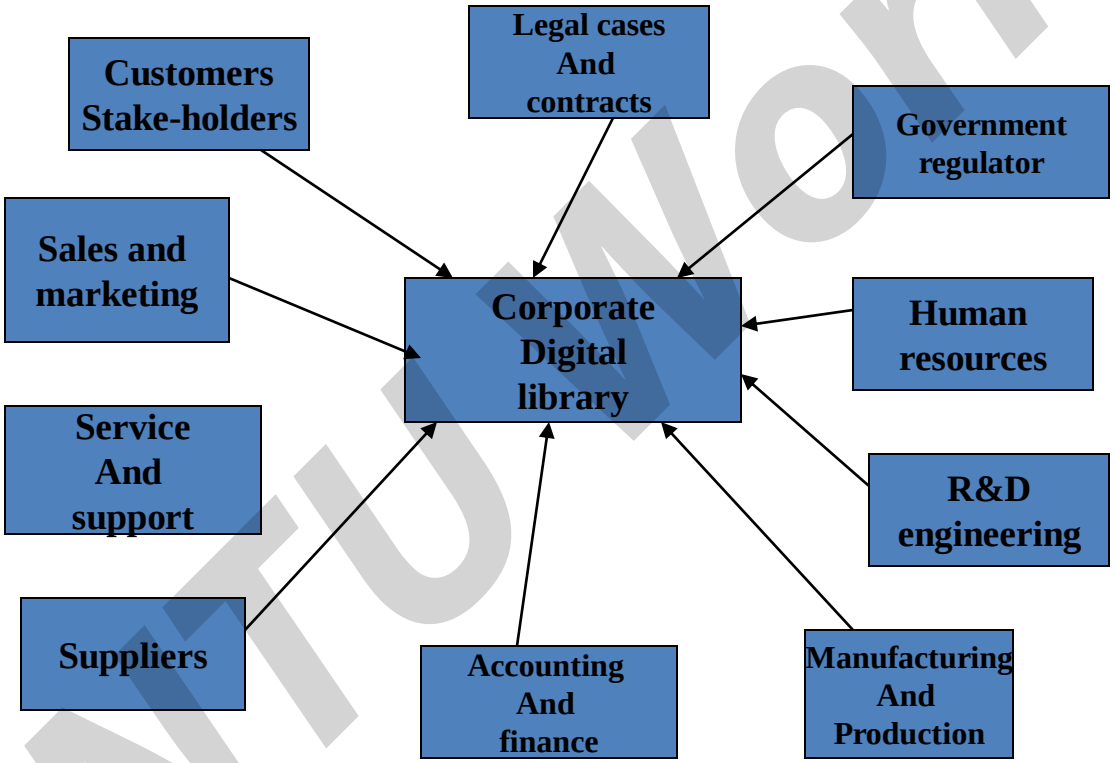
Corporate Digital Library



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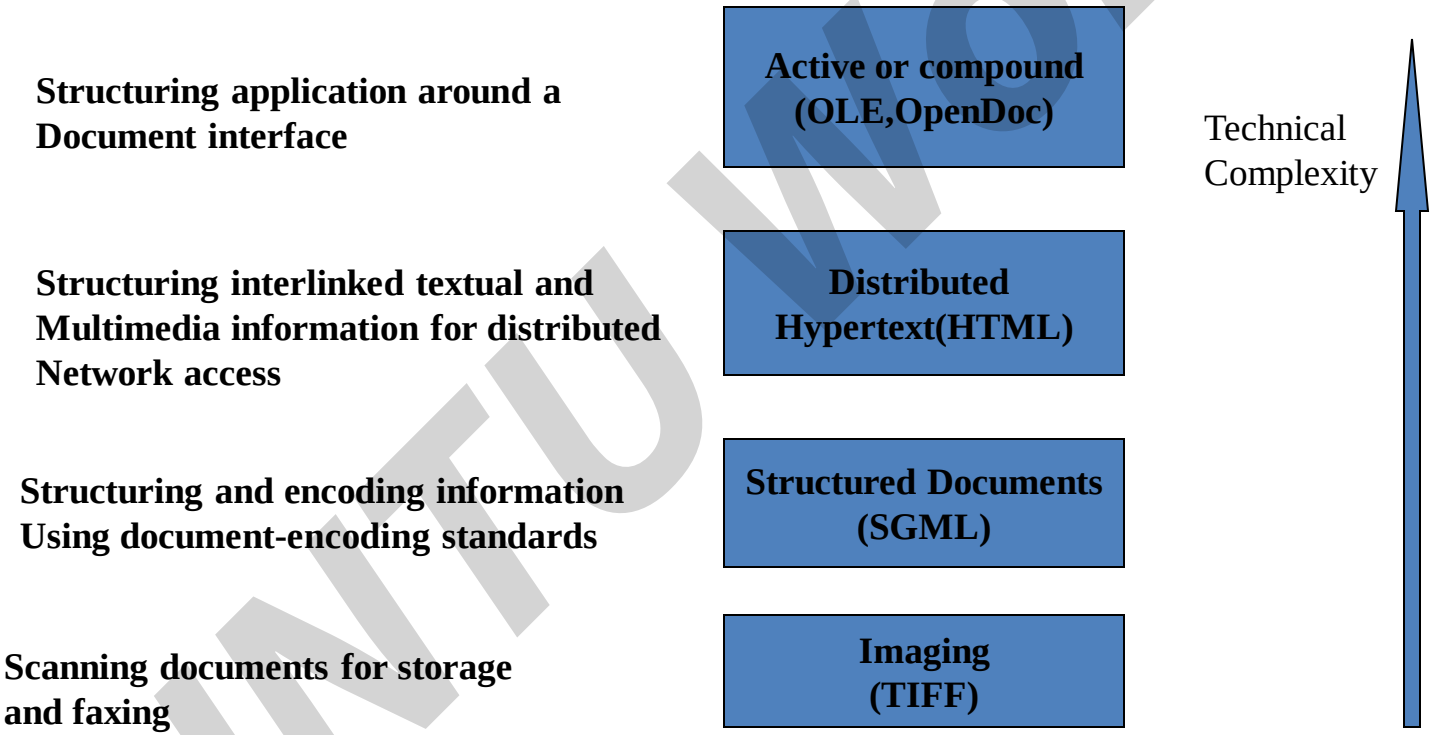
Types of Digital Documents



Types of digital documents

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Types of Digital Documents

- **Document Imaging**
  - **An imaging system passes a paper document through a scanner that renders it digital and then stores the digital data as a bit-mapped image of the document. Keywords for each document that help in indexing and retrieval are entered during scanning.**
  - **Problem with imaging approach is that the output contains only images, not encoded text.**
  - **Searching the text of a document image is possible only using the keywords that categorize that document. Without a specific, well designed list of keywords, a large library of imaged documents would be created but not used effectively**
  - **Imaging systems have use in Insurance companies and other large firms for processing high volumes of routine yet critical documents**

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Types of Digital Documents

- **Document Imaging**
  - **Standards used in imaging**
    - **TIFF (tag image file format): Format for interchange of bit-mapped images.**
    - **ITU-TSS (International Telecommunication Union – telecommunications standardization sector). This standard is used for compression and exchange of bit-mapped files**
  - **Future of document imaging lies in its ability to manipulate and package information for customized delivery.**
  - **Document imaging does not allow packaging or repackaging**

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Types of Digital Documents

- **Structured Documents**
  - **Structured documents apply database structuring capabilities to individual documents and document collections to allow tools to manipulate document content just like fields within database tables**
  - **Document manipulation is compounded by the problems such as they are often lengthy, complex, cross referenced, and encrusted with new information types like spreadsheets, computer-aided design, graphics, multimedia etc**
  - **To work effectively with the digital document, a database approach is most appropriate**
  - **It is similar to TOC(Table of Contents) approach which provides a structure that serves as an effective index to underlying document content**

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Types of Digital Documents

- **Structured Documents**
  - **Structured documents provide the following capabilities**
    - **Document formatting and rendering suits different information delivery vehicles or media. This affects how users interact with onscreen help, educational materials, and documentation**
    - **The ability to create easily modifiable structures allows more dynamic documents and user interaction and manipulation, such as the ability to create bookmarks, highlight text, and write notes. Documents can be edited, cross-referenced, and linked to other items, such as graphics, video, photo, or voice scripts**
    - **Given the right structure and interface, electronic documents can be easier to search and query**

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Types of Digital Documents

- **Structured Documents**
  - **Structured document standards**
    - **SGML (standard generalized markup language) – an ISO standard for interchange and multi-formatting, description of text documents in terms of their logical structure**
    - **ODA (office document architecture) – an ANSI and ISO standard for interchange of compound office documents. ODA specifies both content and format**
    - **CDA (compound document architecture) – defines a set of ground rules- content and format- and services for the interchange of compound documents between applications**
    - **RTF (rich-text format) – developed by Microsoft for interchange of text between Microsoft desktop products**

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Types of Digital Documents

- **Hypertext Documents**
  - **Hypertext is a way of making document-based information more mobile. Mobility of information is necessary for**
    - **Information in enterprise is seldom located on one node or server but is distributed throughout the organization**
    - **Accessing and retrieving large monolithic documents is time consuming. Support for hypertext functionality, enabling cross-referencing and conditional branching to related parts of an electronic document, is an essential requirement**
    - **Reuse of document fragments for composing new documents is more effective when information stored on individual systems and servers across an enterprise can be accessed from remote locations**

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Types of Digital Documents

- **Hypertext Documents**
  - **Relationships between documents can be represented through hypermedia links (hyperlinks) that allow the production of complex, richly connected and cross-referenced bodies of knowledge. This structuring and navigation mechanism has been used effectively to deal with the presentation of large amounts of loosely structured information, such as on-line documentation or computer-aided learning.**

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Types of Digital Documents

- **Hypertext Documents**
  - **Active Documents**
    - **Active documents (or compound documents) represent what is known as document-oriented computing. Active documents provide an interactive interface where all documents, applications, and data related to a particular task are assembled, arranged, and interlinked in such a manner that the user can focus on the task at hand and be shielded from non-task-related issues like access, storage, data formats, location, computing, or delivery mechanisms**
    - **Active documents are especially powerful because they combine the notion of composition of information with the distributed nature of information. Active documents allow spreadsheet, word-processing and other multimedia objects belonging to different applications to be dragged and dropped into a single file**

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Types of Digital Documents

- **Hypertext Documents**
  - **Active Documents**
    - **Active documents allow users to create interfaces that are dynamically updated from remote data and computation objects that may be stored in the document libraries on the network.**
    - **The active documents uses links to reference distributed objects or documents instead of making a local copy of each entity. Linking enables composite documents that are portable across multiple operating systems that can "intelligently" evaluate and act on network data**
    - **The increased role of the active document is tied directly to the emergence of distributed network computing and object-oriented application environments.**

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Types of Digital Documents

- **Issues in Document Infrastructure**
  - **Variance in end users' needs and sophistication**
  - **Diversity in hardware performance**
  - **Large – both in size and number**
  - **Information resources that are physically distributed**
  - **Heterogeneous types of information resources and multimedia data types created by a variety of departments**
  - **Need for extendibility to add new collections**
- **Document Constituencies**
  - **Emerging document processing and management strategies must address three constituencies**
    - **End Users – End users want to do more with the information in their documents than merely store them to disk or occasionally print them. They need systems to access distributed repositories and to manipulate them in a number of ways**

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Types of Digital Documents

- **Document Constituencies**
  - **Developers – Developers need a framework to prevent ad hoc system design and assure the longevity and flexibility of documents and the information they include in the face of new technological advancements**
  - **Document librarians – Librarians mange the dissemination and maintenance of information. This role will alter the process by which workers create, find, and use information they need in the networked environment**
- **Document-oriented Processes**
  - **Document Creation – End users want to be able to create mission-critical documents cooperatively on disparate systems and applications, so links between these systems to be seamless**

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Types of Digital Documents

- **Document-oriented Processes**
  - **Document Media Conversion – End users are looking for systems that accept multiple forms of input – hardcopy, image, text, numeric data, video, and sound**
  - **Document production and distribution –End users need interfaces between document creation, document production, and document distribution systems. They want to**
    - **Direct document output via networks to print on demand systems**
    - **Exploit just-in-time document production using page description languages, image retrieval, and network storage technologies**
    - **Simplify document production by integrating finishing into high speed production processes**
  - **Document storage and retrieval – end users seek integrated archival storage and retrieval support with easy access to whole documents as weel as document elements such as text passages and illustrations**

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Types of Digital Documents

- **Document-based work flows**
  - **Four activities make up document-based work flow**
    - **Document modeling defines structures and processes of operational systems, both internal and external to the enterprise**
    - **Transformation creates modules for capturing, validating, transforming, and applying key operational concepts**
    - **Synthesizing creates value-added informational objects from the combination of two or more documents**
    - **Business modeling defines the structures and processes of the business environment, both internal and external to the enterprise**

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Corporate Data Warehouse

- **Corporate Data Warehouses**
  - **Data warehouses are necessary as enterprise wide data increase in both complexity and volume, making it important to establish an information systems architecture that transforms scattered legacy data into useful information. Data warehouse performs the following functions**
    - **Allows existing transaction and legacy systems to continue in operation**
    - **Consolidates data from the various transaction systems into a coherent set**
    - **Allows analysis of vital information about current operations for decision support**

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Corporate Data Warehouse

- **Corporate Data Warehouses**
  - **Organizations that use data warehousing have the following characteristics**
    - **An information-based approach to decision making**
    - **Involvement in highly competitive, rapidly changing markets with a large, diverse customer base for a variety of products**
    - **Data stored in many systems and represented differently**
    - **Data stored in complex, technical, difficult-to-decipher formats, making conversion for analysts difficult**
- **Types of Data Warehouses**
  - **Physical data warehouse – this is an actual, physical database into which all the corporate data for the data warehouse are gathered, along with the schemas and the processing logic used to organize, package, and preprocess the data for end user access**

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Corporate Data Warehouse

- **Types of Data Warehouses**
  - **Data Library – This is a subset of the enterprise wide data warehouse. It performs the role of a departmental, regional, or functional data warehouse. Organization builds a series of data libraries over time and eventually links them via an enterprise wide logical data warehouse**
  - **Decision support systems (DSSs) – these are applications that make use of data warehouse**
- **Building an end-to-end Data Warehouse**
  - **Three elements that are crucial in having a complete datawarehouse are**
    - **Back End – Accessing and organizing data easily from different sources**
    - **Preparing data for analysis – Querying, searching, and governing the data**
    - **Front end – Providing means for effective analysis of the information**

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Corporate Data Warehouse

- **Building an end-to-end Data Warehouse**
  - **Back End – This processes consolidates operational data from on-line transaction-processing systems into the informational data of the warehouse. Data are not only consolidated but also restructured, which make information in the data warehouse differ from those in the production transaction databases**
  - **Managing data –this stage is vital for decision support, as it creates a standard organization and language by which data are recognized, queried, and reported. Following steps are adopted**
    - **Translation – Prior to analysis, data requires translation because data loaded into the warehouse are from many separate applications and may be encoded differently**
    - **Summarizing – in this step, relational data are grouped into views more convenient and useful to managers**
    - **Packaging – the detailed summarized data is put into more usable formats such as spreadsheets, text documents etc**

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Corporate Data Warehouse

- **Building an end-to-end Data Warehouse**
  - **Distributing – The warehouse data is distributed to appropriate groups to increase availability and accessibility.**
  - **Garbage collection – to help maintain the viability of the warehouse data, older data which can not longer be economically maintained within the core warehouse, must be sent off to a hierarchical storage archive**
- **Exploring data: The Front End – key activities that make up the front end are**
  - **User Retrieval – End users request the data they need. Environment should be established for using effective query tools. Access to the warehouse should be driven by the consumer, rather than the warehouse**
  - **Proactive delivery – The warehouse publishes various "business objects" that are revised on a periodic basis. Consumers subscribe to the set of business objects that best meet their needs.**

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Corporate Data Warehouse

- **Advantages of Data Warehouse**
  - **Timely and accurate information becomes an integral part of the decision-making process**
  - **Users manage and access large volumes of information in one cohesive framework**
  - **Managers can distribute subject-oriented information on a variety of platforms, enabling faster decision making**
  - **Corporate management can perform in-depth analysis that allows them to fine-tune their product mix, reduce administrative overhead, and ultimately increase profit margin**
  - **A unified view of enterprise information over a five-to-ten year time frame provides the enterprise with an excellent comparative analysis, trending and forecasting tool**

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e-Advertising and Marketing

- **Interactive marketing brought on by electronic commerce will change the roles of small business, retailers, manufacturers, and media companies**
  - **Retailers versus manufacturers**
    - **Retailers will have an advantage over manufacturers because they can measure customers response and get first feel at the broadest range of information. Information based marketing can offer manufacturers and retailers a means to do market research and customer prospecting; to establish brand loyalty, market presence and distribute redeemable coupons; and to create customized product bundles**

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e-Advertising and Marketing

- **Market research and customer prospecting**
  - **For a fraction of conventional high-tech methods of collecting prospect data, companies can put up Internet information servers and launch discussion lists on topics that their customers care about. Presence and intelligent interactions will unlock the commercical opportunities on-line.**
  - **Companies collect information about customer preferences that enables it to further refine its marketing strategy**
  - **Marketers sell the detailed information they collect to others**
- **Market Presence**
  - **Customer information systems that collect detailed consumer purchase patterns will change the practice of promotional discounts, reducing across-the board promotions and providing steeper but highly targeted discounts. With emerging customer information technologies , it is possible for both manufacturers and retailers to offer discounts only to those customers for whom it pays, to those who are cost sensitive enough to switch brands or change shopping habits permanently**

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e-Advertising and Marketing

- **Product or service bundling**
  - **Bundling is a marketing strategy in which two or more complementary products and/or services are offered as a package at a discounted price. In on-line world, information bundling becomes especially easy because of hyperlink capability. Eg. A computer video card could be linked to compatible products such as software that runs best on it**
- **Information based products – Pricing and priority**
  - **A new commodity, the information product, is emerging which is enabled by global networking infrastructure. Eg. Software, entertainment, electronic books, information data bases, and product catalogs. Information products will most likely to be priced based on speed of availability**

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e-Advertising and Marketing

- **Target and Micromarketing**
  - **In electronic commerce, technology has put target and micromarketing with in the reach of the small business. Computers have enabled micromarketeres with more knowledge, not only about their own business but also about the customer, to develop and exploit niche markets. Customer targeting is one way to get closer and to create and sustain a two-way flow of communication between the seller and the buyer**
  - **Direct mail and telemarketing are two fast-growing ways to micromarket.**
  - **As new on-line technologies become available and as more custmer information is gathered over the next decade, marketeres will build databases of great scale and depth**

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e-Advertising and Marketing

- **Small business versus large**
  - **Key distinction between small and large firms remains access to national and international markets for advertising purposes. The high costs of advertising have served to ensure that small businesses rarely grown beyond local markets**
  - **With the advent of e-commerce, small business can now bridge this gap**
  - **As the Internet and other public networks come of age, since international audience can be effectively reached by the use of innovative Internet based advertising**
  - **On-line advertising on public networks is expected to level the playing field for small to medium-sized businesses and enable them to compete with large corporations on a global stage**

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Advertising on the Internet

- **Advertising conveys much needed information . It should be interesting, message-oriented and creative**
- **Advertising generates significant revenue and affects the costs of infrastructure**
- **Key questions to be addressed in Internet advertising**
  - **Advertising process – How can advertising be offered in a way that meets the needs of both advertisers and potential buyers**
  - **Core Content – What kind of advertising content is most useful to both advertisers and potential buyers**
  - **Supporting content – What additional services can meet the information needs of advertisers**
  - **Market and consumer research – How can the needs of advertisers be met without either interfering with or invading the privacy of other on-line consumers**
  - **Repeat customers – How can viable, sustainable, and mutually beneficial relationship be created between information publishers, advertisers, and consumers?**

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Advertising on the Internet

- **On-line advertising Paradigms**
  - **Active or push based advertising**
    - **Broadcast model**
      - » **Typically use direct mail, spot television or cable television**
      - » **Text based broadcast messages can be seen in advertising posted in USENET groups**
      - » **Is intrusive and resource intensive when implemented in on-line environments**
      - » **Drawback is that it requires active choice on the part of the customer to watch the program or read the message**
    - **Junk mail model**
      - » **Is the most intrusive of all forms of Internet advertising**

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Advertising on the Internet

- **Passive or pull based advertising – provides a feedback loop, connecting company and customer. Internet offers means for people to talk to other people. It includes**
  - **Billboard model**
    - » **Refers to information placed where it will come to the attention of customers in the course of other activities and does not require active search**
    - » **Advantage of billboard is the ability to completely cover a market and maintain high levels of viewing frequently. It has no cost to the customers**
    - » **Disadvantages are related to viewing time. Because target customers are typically surfing or moving, a billboard advertisement must communicate with a minimum of words. Messages must be simple, direct and easily understood**

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Advertising on the Internet

- **Catalog and Yellow Pages Directory model**
  - **Catalog model is the least intrusive model but requires active search on the part of the customer**
  - **Directory services refers electronic resource location and services, yellow pages services, mail address lookup and the like**
  - **Advantages of Yellow Pages is ad permanence and the ability to target a well defined area. They are relatively low in cost in terms of both ad production and placement**
- **Consumer Endorsements**
  - **Endorsements, where people tell of their experiences with products and services- both positive and negative- represent one unique aspect of advertising on the Internet.**
  - **Endorsements are among the most effective advertisements on the Internet, because they are offered publicly in an interactive medium.**
  - **Advertisers whose products and services are discussed positively by others gain customers and loyalty**
  - **Advertisers can learn about customers' problems- and slove them and let others know that those problems have been solved**

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Advertising on the Internet

- **Types of Online-Advertisements**
  - **Floating ad: An ad which moves across the user's screen or floats above the document**
  - **Expanding ad: An ad which changes size and which may alter the contents of the web page**
  - **Polite ad: A method by which a large ad will be downloaded in smaller pieces to minimize the disruption of the content being viewed**
  - **Wallpaper ad: An ad which changes the background of the page being viewed**
  - **Trick banner: A banner ad that looks like a dialog box with buttons. It simulates an error message or an alert**
  - **Pop-up: A new window which opens in front of the current one, displaying an advertisement, or entire webpage**
  - **Pop-under: Similar to a Pop-Up except that the window is loaded or sent behind the current window so that the user does not see it until they close one or more active windows**

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Advertising on the Internet

- **Types of Online-Advertisements**
  - **Video ad: similar to a banner ad, except that instead of a static or animated image, actual moving video clips are displayed. This is the kind of advertising most prominent in television, and many advertisers will use the same clips for**

    both television and online advertising
  - **Map ad: text or graphics linked from, and appearing in or over, a location on an electronic map such as on Google maps**
  - **Mobile ad: an SMS text or multi-media message sent to a cell phone.**
  - **Superstitial: An animated adv on a Web page from Enliven Marketing Technologies. It uses video, 3D content or Flash to provide a TV-like advertisement.**
  - **Interstitial ad: a full-page ad that appears before a user reaches their original destination.**

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Advertising on the Internet

- **Guidelines for Internet Advertising**
  1. **Do not send intrusive messages. Do not send messages that people would not like to receive**
  2. **Do not sell consumer data without the express permission of the user**
  3. **Advertising should appear only in designated news groups and list servers**
  4. **Conduct promotions and direct selling only under full disclosure. Marketers should be free to offer promotions on the network**
  5. **Conduct research only with the consumer's informed consent**
  6. **Never use Internet communications software to conceal activities**

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On-line Marketing Process

- **On-line marketing program has a better chance of being productive if it is timed, designed, and written to solve a problem for potential customers and is carried out in a way that the customer understands and trusts. Following steps are to be considered for interactive marketing process for a new product introduction**

1. **Segment and identify the Target Audience**
    - **Market segmentation is the process of dividing the market into separate and distinct customer groups. Typical segmentation approaches that need to be considered are**
        - **Demographic approaches which categorize the market in terms of population characteristics such as age, income, occupation, race, family size or religion**
        - **Benefit or behavioral approaches which divide the market according to how people beahve their attitudes, or the benefits they seek**

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On-line Marketing Process

1. Segment and identify the Target Audience
   - Volume approaches which distinguish heavy, medium, light or nonusers of a product category
   - Business specialization approaches which categorize the market by type or size of industry or institution
   - Advertisers should start reading the FAQ files associated with many news groups to determine the exact nature of the forum and acceptable use policies
2. Create a coherent advertising plan
   - Determine the advertisement goals and select the target audience for the company message the advertising should speak convincingly to your target audience.
   - Once the advertising campaign has been devised, corresponding promotion materials specially tailored for each particular target audience need to be developed

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On-line Marketing Process

3. Get the content to the Customer

- **Companies need to implement a combined push and pull strategy of content delivery. This can be done via various news groups, listservers, and e-mail will constitute a cost-effective method to reach large numbers of individuals in various target audiences**

4. Correspond and Interact with customers

- **Dialogue with customer, interactive discussion among customers about various features offering endorsements, testimonials, questions/ answers**
- **This can be through – Passive interaction, direct interaction, group dialogue, video conferencing**

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On-line Marketing Process

5. Learn from Customers

- **Incorporating feedback from customer in advertising, marketing strategy**
- **Identifying new markets, using experience in new product development**
- **Repeat customers are 80 percent of the customer base**

6. Provide customer Service and support

- **On-line customer service is an essential part of the electronic commerce chain, where people are more in touch with one another than in any other type of market.**
- **Brand loyalty through customer service needs to be cultivated among on-line customers so that they can come back for repeat purchases**

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Market Research

- **Market Research is extremely important for companies in terms of how they allocate their advertising budget in sales promotions, how they introduce new products, and how they target new markets. This can be divided into three phases – Data collection, data organization and sense marketing**
  - **Data Collection**
    - **This can be done through source databases for understanding consumer behaviour. Either a database producer will collect and collate data, making it available like Dow Jones or a central hosts like CompuServe , America Online. This data gives the ability to systematically piece together how consumers are viewing the published information, what paths they are navigating, how much time they spend on each page of information. This knowledge can be effectively used to tailor the information that customers interact with**

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Market Research

- **Data Organization**
  - **The ability to refine and customize information for select business customers is one of the key abilities in this environment. It enables the company to**
    - **Leverage its established databases into customized offerings aimed at different audience and markets. Leverage its established databases in term of horizontal growth by cross-selling into a different market that may be in another industry or region. Grow vertically by selling to the same customer through bundling additional or new value-added information, in terms of fulfilling a need that the customer never anticipated**
- **Data Analysis**
  - **The ability to link databases to analytic tools like econometric programs and forecasting models will increase the potential market and gives ability to predict future trends**

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E-Commerce

UNIT- 7

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Consumer Search

- **Fundamental goals of electronic commerce are**
  - **Availability which is accomplished through improved publishing tools that provide ready access to a voluminous amount of product information, including descriptive information from sellers (price, features, availability and other qualities) and rating information from third parties**
  - **Accessibility might be enhanced through search and retrieval tools. With thousands of databases, it can often take consumers hours or days to utilize the information-processing power of the computer to improve decision making without increasing the time and the effort expended in making choices**
  - **Designing flexible ways of navigating, searching, and retrieving pertinent information from on-line databases is important in light of its implications for individual and organizational decision making**

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Consumer Search

- **Information search challenges**
  - **Turnover of the information is rapid, given that electronic market environments tend to be information intensive and constantly changing.**
  - **Consumers also experience frequent turnovers in their general stock of knowledge and so must engage in extensive search efforts to keep up to date. Electronic markets impose different types of information processing demands on consumers due to the rate of information change. Challenge is to design search and retrieval process that maximize an individual's value in terms of time cost and information tools**
  - **Information overload contributes to long search times. Users must be able to find a small number of products that form the best alternatives to suit their individual search needs. While consumers may know their individual preferences, they lack knowledge of which products have which attributes**
  - **Customers want information about the products and services they buy, they want to make intelligent choices based on "complete" information. The challenge is how to represent this information on the screen in an effective manner**

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Search and Resource Discovery Paradigms

- **Information and search and resource discovery paradigms are**
  - **Information Search and Retrieval**
    - **Search and retrieval begins when a user provides a description of the information being sought to an automated discovery system.**
    - **Using the knowledge edge of the environment, the system attempts to locate the information that matches the given description. The challenge is to develop retrieval and search strategies that help the naive or unfocused user in domains such as electronic shopping.**
    - **The search and retrieval methods that refine queries through various computing techniques such as nearest neighbors, term variants of original query, and other methods may be useful**

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Search and Resource Discovery Paradigms

- **Information and search and resource discovery paradigms are**
  - **Electronic Directories and catalogs**
    - **Information organizing and browsing is accomplished using directories or catalogs. Organizing refers to the human-guided process of deciding how to interrelate information, usually by placing it into some sort of a hierarchy. Browsing refers the corresponding human-guided activity of exploring the organization and contents of a resource space**
    - **Information browsing depends on the quality and relevance of the organization. Browsing can lead to navigational problems and disoriented users.**

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Search and Resource Discovery Paradigms

- **Information and search and resource discovery paradigms are**
  - **Information filtering**
    - **The goal of information filtering is to select all and only that information that is relevant and reduce it to a manageable and understandable set. The focus is on providing efficient access to the constantly changing information for a specific task.**
    - **The access is controlled through software filters that only allow pertinent information to pass through in a form that enables the decision maker to have more choice and flexibility in responding to a volatile busieness environment.**
    - **Filters can be local and remote. Local filters work on incoming data to a PC. Remote filters are software agents that work on behalf of the user and roam around the network from one database to another**

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Information Search and Retrieval

- **Information Search and Retrieval**
  - **Information search is sifting through large volumes of information to find some target information. Search and retrieval systems are designed for dealing with unstructured or semi-structured data.**
  - **The process of searching for text strings in a large collection of documents can be divided into two phases.**
    - **The end-user-retrieval phase consists of three steps that the user performs during the text search.**
      - **The user formulates a query**
      - **The server iterprets the user's query, performs the search, and returns to the user a list of documents meeting the search criteria**
      - **The user selects from the list and browses them**
    - **The publisher indexing phase consists of entering documents into the system and creating indexes and pointers to facilitate subsequent searches. The process of loading documents into the system and updating indexes is not a user concern**

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Information Search and Retrieval

- **Wide Area Information Service (WAIS) Engine**
  - **WAIS enables users to search the contents of files for any string of text that they supply. WAIS uses and English-language like query front end to a large assortment of databases that contain text-based documents**
  - **The server takes a user's question and do their best to find relevant documents. The WAIS server returns a list of documents that contain the specified phrases and key words**
  - **WAIS has three elements – a client, a server, and an indexer. The indexer takes a list of files the publisher wants to index and generates from it several index files. When users search through the centralized directory of servers, they will be linked to the indexes.**
  - **WAIS allows users to identify and select information from large databases. It provides heterogeneous database access, as published databases may be on a variety of different systems and the user need not know how to use each system. It provides ways to download and organize the retrieved data so that users are not overloaded with information**

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Information Search and Retrieval

- **Indexing methods**
  - **Two types of indexing methods are used by search engines**
    - **Word-level indexing stores the location of every instance of word. These indexes enable users to search for complete phases or words that are in close proximity. Word level indexing consumes a lot of disk space.**
    - **First-level indexing associates each indexed word with a list of all the files in which that word appears at least once. A file-based index does not carry any additional information about the location of words within files. Such an index uses disk space economically**

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Information Search and Retrieval

- **Indexing methods**
  - **Indexing packages fall into three categories**
    - **The client-server method based on the distributed approach in which the document and text search retrieval software reside on a central server, while sophisticated data presentation and user-interface software reside on the user's work station.**
    - **In this approach the index file can be split into pieces according to work groups and maintained on separate servers. This approach provides fast response time for documents "owned" locally. Searches of portions of the index stored on other servers can be performed in the background while the user is retrieving and studying locally owned documents.**
    - **Disadvantage of this approach is that each subindex has to be updated individually each time the master file is updated**

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Information Search and Retrieval

- **Indexing methods**
  - **Indexing packages fall into three categories**
    - **The mainframe-based approach which is more expensive and less flexible but provides for large amounts of storage, fast response time and standard data management and configuration control.**
    - **Parallel processing approach allows many processing units to conduct searches simultaneously. The file to be searched is broken-up into many pieces, and each processor searches its segment of the index file. If the processors and the segments are balanced, each processor can operate independently of the others, and all processors complete processing at approximately the same time. The results are merged before being presented to the user**

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Information Search and Retrieval

- **Search Engines**
  - **The purpose of a search engine is to find every item that matches a query, no matter where it is located in the file system**
  - **Search by topic which uses both key words and information searching to rank the relevance to each document.**
  - **Search can be context-based which let the user enter a query and then come up with the relevant data based on the context of the documents themselves. The system tries to figure out the content of the documents based on the context of the words. The system finds documents with the right meaning**

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Information Search and Retrieval

- **Search and new data types**
  - **Hypertext - Richly interwoven links among items in displays allow users to move in relatively ad hoc sequences form display to display within multimedia database applications**
  - **Sound – Speech input and output, music, and a wide variety of acoustics including realistic sounds that supplement and / or replace visual communication**
  - **Video – Analog or digital video input form multiple media, including videotape, CD-ROM, incorporated broadcast video tuners, cable, or satellite downlinks, provide video imagery that supplement and / or replace traditional computer-generated graphics**
  - **3D images – Virtual reality displays offer a 3D environment in which all portions of the user interface are 3D. 3D special effects already exist in existing interfaces using techniques that overlap planes, cast shadows on other objects, highlight surfaces, and so on**
- **Searching through these new types of information poses challenges that need to be addressed**

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Information Search and Retrieval

- **WWW Robots, Wanderers, and Spiders**
  - **Robots, Wanderers and Spiders are all programs that traverse the WWW automatically gathering information. Robot and spider are used in reference to automated tools for access to publicly accessible databases on the Internet for the purpose of building indices of documents**
  - **Resource discovery programs walk the WWW and record the appearance and disappearance of resources**
  - **A software agent views the WWW as a graph. It starts a set of nodes (.HTML) and traverses the hypertext links in these nodes to a certain depth beginning at a URL passed as an argument. Only URLs having "." suffixes or tagged as "HTTP:" and ending in a "/" are probed**
  - **Because of time constraints and the heterogeneity of the information and of the repositories, it will not be possible to perform exhaustive searches throughout the Internet, and it will most likely be necessary to conduct multiple searches in parallel. This leads to the possibility of multiple software agents that cooperate and conduct separate searches for information**

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Information Search and Retrieval

- **Specific Models for Information Retrieval**
  - **The three major search methods are**
  - **Boolean – which is based on the "exact match" principle and is the standard for most popular information retrieval systems. The term Boolean is used because the query specifications are expressed as words or phrases, combined using standard operators OR, AND, and NOT**
  - **Vector Space model treats texts and queries as vectors in a multidimensional space, the dimensions of which are the words used to represent the texts. The vector model processes queries and texts by comparing the vectors. The model has the ability to weight terms of a query, or text representation, to take account of their importance. These weights are computed on the basis of the statistical distributions of the database and in the texts**
  - **Probabilistic information retrieval models are based on the probability ranking principle. This states that the function of a retrieval system is to rank the texts in the database in the order of their probability of relevance to the query**

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Electronic Commerce Catalogs (Directories)

- Directories perform an essential support function that guides customers in a maze of options by enabling the organization of the information space. Finding things (users, resources, data or applications) in a distributed network is the task of the directory service. Directories inform a potential customer or software agent about available services, providers, prices, quality, and other important characteristics necessary for making purchasing decisions.
- Directories are essential for conducting electronic commerce. Only thorough the use of distributed, replicated information in the form of directory services it is possible to grant users transparent access to all network resources
- Directories are of two types
  - White pages which are used to locate people or institutions
  - Yellow pages which are oriented toward consumers who have decided to buy a product or service

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Electronic Commerce Catalogs (Directories)

- An effective directory service must be readily accessible by all network components, provide quick response times, and accurately reflect changes in network configurations and resources as they occur
- The challenge is to create a directory representation that can be accessed by different types of networks(wired and wireless), different types of interfaces(TV set-top, mobile units, PCs), different types of access applications(e-mail, procedure or function calls, or dial-up) and various applications (home shopping, home banking, electronic stock brokers)
- Directory services must map large numbers of objects (users, organizations, groups, computers, printers, files, processes, and services) to user-oriented names.
- Directories must be organized in a manner that facilitates easy access to information, and the directory user must be able to locate “entries” in the directory where the actual information is stored or presented

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Overview of the Directory Business

- **Electronic White Pages**
  - **Electronic white pages provides services from a static listing of e-mail addresses to directory assistance. The Internet directory services can be more extensive as the technology provides the ability to publish important information that an individual may make publicly available, such as photographs, home mailing addresses and fax numbers, office automation, and job descriptions**
  - **White pages directory performs the functions of searching and retrieving. Searching is the ability to find people given information about them. Searching is accomplished by looking up an index. Retrieval is obtaining additional information associated with a person, such as an address, telephone number, e-mail mailbox, or security certificate**
  - **To establish a white pages directory service that accommodates multiple technologies, a "common ground" approach should be adopted with a high functionality and a low entry cost.**

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Overview of the Directory Business

- **White pages through X.500**
  - **The goal of 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 for its local part of the directory, so that updates and maintenance can be done easily**
    - **Searching capabilities – X.500 provides powerful searching facilities that allow users to construct arbitrarily complex queries.**
    - **Single Global name space – X.500 provides a single name space to users**

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Overview of the Directory Business

- White pages through X.500
  - 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 require distributed information. These applications can access a wealth of information in a uniform manner, no matter where they are based or currently running
  - X.500 requires three models to build the directory service. They are the directory "architecture" model, the information "architecture" model, and the security model

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Overview of the Directory Business

- **White pages through X.500**
  - **The directory is composed of a collection of servers known a directory system agents (DSAs). A DSA is essentially a server that stores information according to the X.500 standard and can, when necessary, exchange data with other DSAs. The DSAs cooperate to provide the overall dierectory services to directory user agents (DUAs)**
  - **Directory is a collection of DSAs cooperating among themselves to hold information about a variety of objects, thus forming the directory information tree (DIT). The DIT is a hierarchical data structure consisting of a root, below which countries are defined. Below the countries organizations are defined, below organizations persons, or first additional organizational units are defined.**
  - **Each DSA holds a part of the global directory and is able to fan out, through the hierarchical DIT structure, which DSA holds which parts of the directory.**
  - **A user of the directory can be a person or a computer program. The organization and distribution of information among DSAs is totally transparent to the users**

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Overview of the Directory Business

- **White pages through X.500**
  - **A user accesses the directory through a directory user agent. The DUA automatically contacts a nearby DSA by means of which the user may search or browse through the DIT and retrieve corresponding information**
  - **The DUA interacts with the directory by communicating with one or more DSAs. A DUA need not be bound to any particular DSA. The DSA carries out the requests of the DUA. It returns the requested information or obtains the necessary information from other DSAs if it does not have the necessary information**
  - **If the required information is not contained within the local server (DSA), various server agents might become involved and might need to cooperate to provide the information. This can be achieved through**
    - **Chaining – involves passing a request to several DSAs before a response is generated**
    - **Referral – identifies "more suitable DSAs" who can satisfy the needs of the user. A DSA might return a referral to a user or another DSA if the request cannot be performed**

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Overview of the Directory Business

- White pages through X.500
  - Multicasting – Multicasting involves passing the same request by a DSA to two or more DSAs
  - Hybrids– Chaining, referrals, and multicasting can be combined as necessary to perform the intended request
- Electronic Yellow Pages
  - Basic yellow pages – These directories could be organized by human-oriented product and service listings, unlike the archaic SIC codes, and accept advertising
  - Business directories - These directories might take the form of extended information about companies, financial health, news clippings, or whatever. There could be many of these directories, suited to different research tasks (investment, foreign trade, manufacturing)
  - State business directories – Every business in a state is arranged by type and by city. This type of directory is useful in businesses that operate on a state or geographic basis

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Overview of the Directory Business

- **Electronic Yellow Pages**
  - **Directory by SIC – Standard Industrial Classification (SIC) directories are compiled by the government**
  - **Manufacturers directory – If the goal is to sell the product or service to manufacturers, then this type of directory would be most useful**
  - **Big-business directory – this directory lists companies of 100 or more employees.**
  - **Metropolitan area business directory – These guides, developed as sales and marketing tools for specific cities, are designed as comprehensive directories listing companies and influential contacts at each business, along with phone number, address, number of employees, and so on**
  - **Credit reference directory – this directory provides credit rating codes for companies. Credit data is used for a variety of purposes such as qualifying new customers, suppliers and so on**
  - **World Wide Web Directory – This directory lists the various hyperlinks of the various servers scattered around the Internet**

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Overview of the Directory Business

- **Electronic Yellow Pages**
  - **Publishers of yellow pages directories can be divided into two categories. The first is utility-related publishers, or companies that publish yellow pages directories for the telephone companies. The second category consists of independent publishers, many of whom produce directories tailored to specific market segments**
- **Interactive Product Catalogs**
  - **The goal of interactive catalogs is to enable customers everywhere to buy goods from any where in a virtual mall open 24 X 7 . Customers look through the on-line merchandise and interact with the company using several methods, such as e-mail, form-based secure messaging systems, interactive desktop video, and other methods**
  - **Interactive catalogs are ideally suited for small businesses, as they enable them to effectively utilize their limited marketing, support, and sales staff with potential customers around the world. These business must collect detailed demographic and life-style information about large numbers of consumers in order to determine effective market segments.**

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Overview of the Directory Business

- **Interactive Product Catalogs**
  - **They must integrate this mass of information into a concrete understanding of what products different consumers want and what they're willing to pay.**
  - **Catalogs must support product / service bundling, coordinated purchasing, and associated financing.**
  - **Effective catalogs mean reaching the consumer with information that includes positioning information to establish image, brand , and detailed product specifications.**
  - **Marketing new products via on-line catalogs requires an effective communication flow to inform the consumer about features and benefits.**
  - **The objectives of interactive catalogs is to promote, sell and provide customer for specific products and services**

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Information Filtering

- **Information filtering describes a variety of processes involving the delivery of information to people who need it. Typical features include**
  - **Filtering systems involve large amounts of data. Typical applications would deal with gigabytes of text, or much larger amounts of other media**
  - **Filtering typically involves streams of incoming data, either being broadcast by remote sources or sent directly by other sources. Filtering is often meant to imply the removal of data from an incoming stream, rather than finding data in that stream. In the first case the users of the system see what is left after the data are removed, in the latter case, they see the data is extracted.**
  - **Filtering is also been used to describe the process of the accessing and retrieving information from remote databases, in which case the incoming data are the result of a search query**
  - **Filtering is based on descriptions of individual or group information preferences called profiles. Such profiles typically represent user interests.**
  - **Filtering systems deal primarily with textual information**

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Information Filtering

- Intelligent filters have the potential to solve information search and retrieval in large information spaces.
- Software filters process a document, interpret the information, and give the user capabilities such as speed / scan reading text summarization, generation of abstracts and information extraction

- **Mail filtering agents**
  - Users of mail-filtering agents can instruct them to watch for items of interest in e-mail in-boxes, on-line news services, electronic discussion forums
  - The mail agent will pull the relevant information and put it in the user's personalized newspaper at predetermined intervals.
- **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. News filtering services are primarily targeted to executives who need to keep current concerning their areas of interest

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Consumer-Data Interface

- **Consumer-data interfaces can be broadly classified into**
  - **Human-computer interface – A broad range of integrated technologies will allow humans and computers to interact effectively and naturally. Technologies for speech recognition and generation, GUIs , user-sensitive interfaces to customize and present information for particular levels of understanding, touch, facial expressions, and gestures to interact with machines are being developed**
  - **Heterogeneous database interfaces – Methods to integrate and access multiple structured databases composed of multi-formatted data will be developed**
  - **User-centered design tools /systems – New models and methods that lead to interactive tools and software systems for architecture or such design are being developed**
  - **Virtual reality and tele-presence – Tools and methods for creating synthetic environments to allow real-time, interactive human participation in the computing / communication loop will be addressed**

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E-Commerce

UNIT- 8

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Multimedia and e-Commerce

- **Multimedia is a combination of text, images, sounds, and animation to provide a comprehensive, interactive environment and is a key element of electronic commerce**
- **A multimedia entity must pass through a series of stages from inception to display and includes**
  - **Image Capture/generation – The image is captured by a sensor such as a television camera or generated by an electronic device**
  - **Compression – The volume of information in the raw image may be too large to be sent through an affordable transmission channel. The data must be compressed to reduce its volume in such a way that the picture can be reconstructed without degradation at the receiving end**
  - **Storage – the compressed data are stored on a CD or network storage servers**
  - **Transport – The data representing the image are prepared for transmission. The speed of transmission depends on the characteristics of the medium.**

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Multimedia and Digital Video

- **A multimedia entity must pass through a series of stages from inception to display and includes**
  - **Desktop processing and display – The data stream containing the images may be stored until ready for display. The images are then decompressed and formatted for display on a television, computer monitor or other appliance**
- **Key Multimedia Concepts**
  - **Multimedia Data Compression**
    - **Data compression attempts to pack as much information as possible into a given amount of storage space and ranges from as little as 2:1 to as much as 200:1, depending on the compression / decompression scheme and level of quality desired**
    - **Compression methods include the following**
      - **Sector-oriented disk compression**
      - **Backup or archive-oriented compression**

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Multimedia and Digital Video

- **Key Multimedia Concepts**
  - **Multimedia Data Compression**
    - **Compression methods include the following**
      - **Graphics and video-oriented compression – Compression techniques designed especially for graphics reduce storage requirements by a factor of 100**
    - **Compression Techniques**
      - **Lossy compression – a given set of data will undergo a loss of accuracy or resolution after a cycle of compression and decompression. This type of compression is usually performed on voice, graphics, or video data.**
      - **Lossless – Lossless compression produces compressed output that is exactly the same as the input. Lossless compression is used on text and numeric data. Lossless compression yields approximately a 2:1 reduction in space**

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Multimedia and Digital Video

- **Key Multimedia Concepts**
  - **Multimedia Data Compression**
    - **Compression Techniques**
      - **Two popular standards for lossy graphics compression are known as MPEG (Motion Picture Experts Group) and JPEG (Joint Photo graphic Experts Group). JPEG is used to compress single graphics images, MPEG is used for motion pictures**
    - **Multimedia Servers**
      - » **A server is a hardware and software system that turns raw data into usable information and then provides that information to users when they need it. It captures, processes, manages, and delivers text, images, audio, and video.**
      - » **For true multimedia information management, platform choices include multiprocessing, multitasking, and multithreaded systems**

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Multimedia and Digital Video

- **Key Multimedia Concepts**
  - **Multimedia Servers**
    - **Multiprocessing is defined as the ability to support the concurrent execution of several tasks on multiple processors. Multiple processors permit servers to do either symmetric or Asymmetric multiprocessing**
    - **Symmetric Multiprocessing**
      - » **Symmetric Multiprocessing treats all processors as equal – any processor can do the work of any other processor. Applications are broken down into tasks, processes, and threads, to be run concurrently on any available processor. The goal is to maximize processor usage or total throughput**
      - » **Asymmetric multiprocessing assigns each task to a specialized processor. The problem with ASMP is that work is not evenly distributed across the separate CPUs**

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Multimedia and Digital Video

- **Key Multimedia Concepts**
  - **Multimedia Servers**
    - **Multitasking – Multitasking means that the server operating systems can run multiple programs and give the illusion that they are running simultaneously by switching control between them.**
    - **Multithreading – Multithreading is a sophisticated form of multitasking and refers to the ability to support separate paths of execution within a single address space**
  - **Multimedia Storage Technology**
    - **Storage technology is becoming a key player in electronic commerce because the storage requirements of modern-day information. Storage and input/output throughput go together in designing, electronic commerce applications. Storage technology can be divided into two types: network-based and desktop-based**

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Multimedia and Digital Video

- **Key Multimedia Concepts**
  - **Multimedia Storage Technology**
    - **Disk Arrays**
      - » **Disk Arrays store enormous amounts of information and are becoming an important storage technology for firewall servers and other electronic commerce servers.**
      - » **CD-ROM – CD-ROM technology exhibits the characteristics of High information density, low unit cost, read-only medium, modest random access performance**

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Digital Video and e-commerce

- **Characteristics of Digital video**
  - **Digital Video is a core component in various electronic commerce applications.**
  - **It can be manipulated, transmitted, and reproduced with no discernible image degradations.**
  - **It allows more flexible routing through packet switching technology. Digital video enables new applications, such as collaborative planning, that would use multiple senders and receivers.**
  - **Digital video compression technology has enabled the development of new applications in consumer electronics, multimedia computers, and communication markets**
- **Digital video compression / decompression**
  - **Compression was done with expensive hardware that was impractical for many applications. Decompression has to be inexpensive to make widespread usage possible. Digital video need to be compatible across applications and among competitive manufacturers' equipment**

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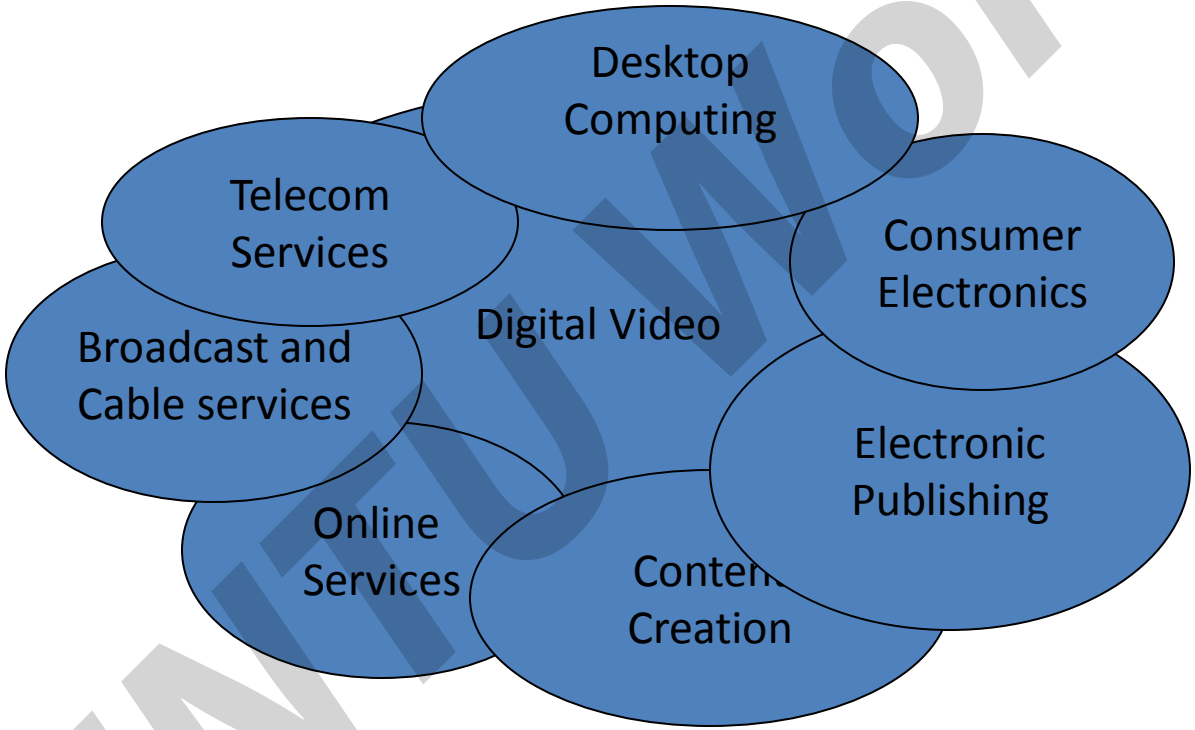
Digital Video and e-commerce



Digital Video as a core element

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Digital Video and e-commerce

- **Digital video compression / decompression**
  - **This is achieved by the adoption of international compression standards called codecs. Codecs attempt to solve the storage problem. Codecs solve throughput problems**
  - **Types of Codecs**
    - **Hybrid codecs use a combination of dedicated processors and software. Three hybrid standards are used – JPEG for compression of still images. MPEG 1 for compression of video to CDs, and MPEG II for compression of video in real time.**
    - **Software codecs provide some advantages for certain types of motion video, Cinepak and Indeo have emerged as the two most commonly used codes on the PC platform. These software-based codecs come bundled in application products (Microsoft video, Apple QuickTime)**

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Desktop Video Processing

- **Video on the desktop is a key element in turning a computer into a true multimedia platform. Digital video include upgrade kits, sound cards, video playback accelerator boards, video capture hardware and editing software, and desktop video software.**
- **Desktop video hardware for playback and capture**
  - **Video Playback**
    - **Video accelerators improve the playback speed and quality of captured digital video sequences, and improve motion-video playback. Specific graphics processors, exist for enhancing playback of digital video. Combined graphics / video accelerator boards provide imroved functionality**
  - **Video Capture and Editing**
    - **Video capture boards are essential for digitizing incoming video for use in multimedia presentations or video conferencing. Once the incoming raw video is digitized, it is handed over to the video compression board via an internal connector. The video capture program also includes video-editing**

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Desktop Video Processing

- **Video Capture and Editing**
  - **Functions that lets users crop, resize, and convert formats and add special effects for both audio and video such as video such as fade-ins, embosses, zooms, and echos. The video capture software for compression and playback is a key ingredient for creating, editing, compressing, and converting digital video files for playback on diverse platforms and environments supporting the chosen video standard**

- **Desktop Video Application Software**
  - **Quicktime and Video for Windows are the software used to playback digital movies.**
  - **QuickTime is a set of software programs from Apple that allows the operating system to play motion video sequences on a PC without specialized hardware**
  - **Video for Windows is a set of software programs from Microsoft that allows Window to play motion video sequences on PC without specialized hardware**

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Desktop Video Conferencing

- **Participants sit at their own desks, in their own offices, and call up others using their PCs much like a telephone. Internetworking and compression technologies enable business users to replicate the meeting environment on the desktop. Three or four windows appear on the screen –One of these is shared space where everyone can interact to edit a commercial in real time or revise a spreadsheet. Each participant also has a private workspace window for writing notes, analyzing data, reading electronic or video mail. Each participant has a mute control for private conversations**
- **Three factors have made desktop video conferencing a viable solution for business and personal communications**
  - **Price – Digital video capture and playback boards are enabling better capture and processing of desktop video at a very low price**
  - **Standards – A worldwide standard for video conferencing is slowly emerging, allowing interoperable communications between machines from different vendors**

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Desktop Video Conferencing

- **Three factors have made desktop video conferencing a viable solution for business and personal communications**
  - **Compression – Sending video through a communications channel requires a lot of bandwidth. Better and faster compression methods are reducing the overhead associated with video conferencing**
- **Data or document conferencing**
  - **Data conferencing is a form of screen sharing. Instead of having full control of a local system, a remote user shares one or more designated windows with a local user. After establishing a desktop-to-desktop connection, the session presents a white board window that both participants view and manipulate. The whiteboard software includes drawing, painting , and annotation tools for brainstorming and sketching, enabling users to emulate the interactive discussions that often take place in real meeting rooms.**

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Desktop Video Conferencing

- **Types of desktop video conferencing**
  - **POTs for Video Conferencing**
    - **Plain Old Telephone systems are specially attractive for point-to-point conferencing because no additional monthly charges are assessed and special arrangements with the phone company. Drawback with a POTs solution is a restriction to the speed of the modems – 28.8 Kbps. Once installed, the video conferencing software allows users to pipe video, audio, and data down a standard telephone line. To shrink the video to analog POTs size, many vendors use a proprietary codec as it serves a product differentiator.**
  - **ISDN for video conferencing**
    - **ISDN lines offer considerably more bandwidth – up to 128 Kbps. For video compression and decompression, the ISDN network uses the H.261 video compression technology. H.261 is a very good compression algorithm and performs very well, it is very computationally intensive and as such requires special-purpose hardware in order to function.**

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Desktop Video Conferencing

- **Types of desktop video conferencing**
  - **Using the Internet for Video conferencing – Two video conferencing programs are available on the Internet: CU-SeeME and MBONE**
    - **CU-SeeMe – Is the first software available for the Macintosh and Windows platforms to support real-time multiparty conferencing ton the Internet. CU-SeeMe provides a one-to-one conference, or by use of a reflector, a one-to-many, a several-to-several, or a several-to-many conferencing depending on user needs and hardware capabilities**
    - **CU-SeeMe is intended to provide useful conferencing at minimal cost.**
    - **CU-SeeMe allows one-to-many broadcasts using the notion of a reflector. Users can dial into a particular computer on the network designated as a reflector and receive the broadcasts that emanates from that site**

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Desktop Video Conferencing

- **Types of desktop video conferencing**
  - **Using the Internet for Video conferencing – Two video conferencing programs are available on the Internet: CU-SeeME and MBONE**
    - **MBONE – MBONE is a virtual network that has been in existence since early 1992. MBONE shares the same physical media as the Internet. MBONE is a Multicast Backbone.**
    - **MBONE is composed of islands that support IP multicasting to local clients. These islands are connected by virtual point-to-point links called tunnels. Routing software called mrouted has been developed to let UNIX workstations act as multicast routers. Between these routers, the multicast IP packets are tunneled with the mrouted machines as destination sites.**
    - **MBONE is a massive virtual network layered on top of parts of the physical Internet.**

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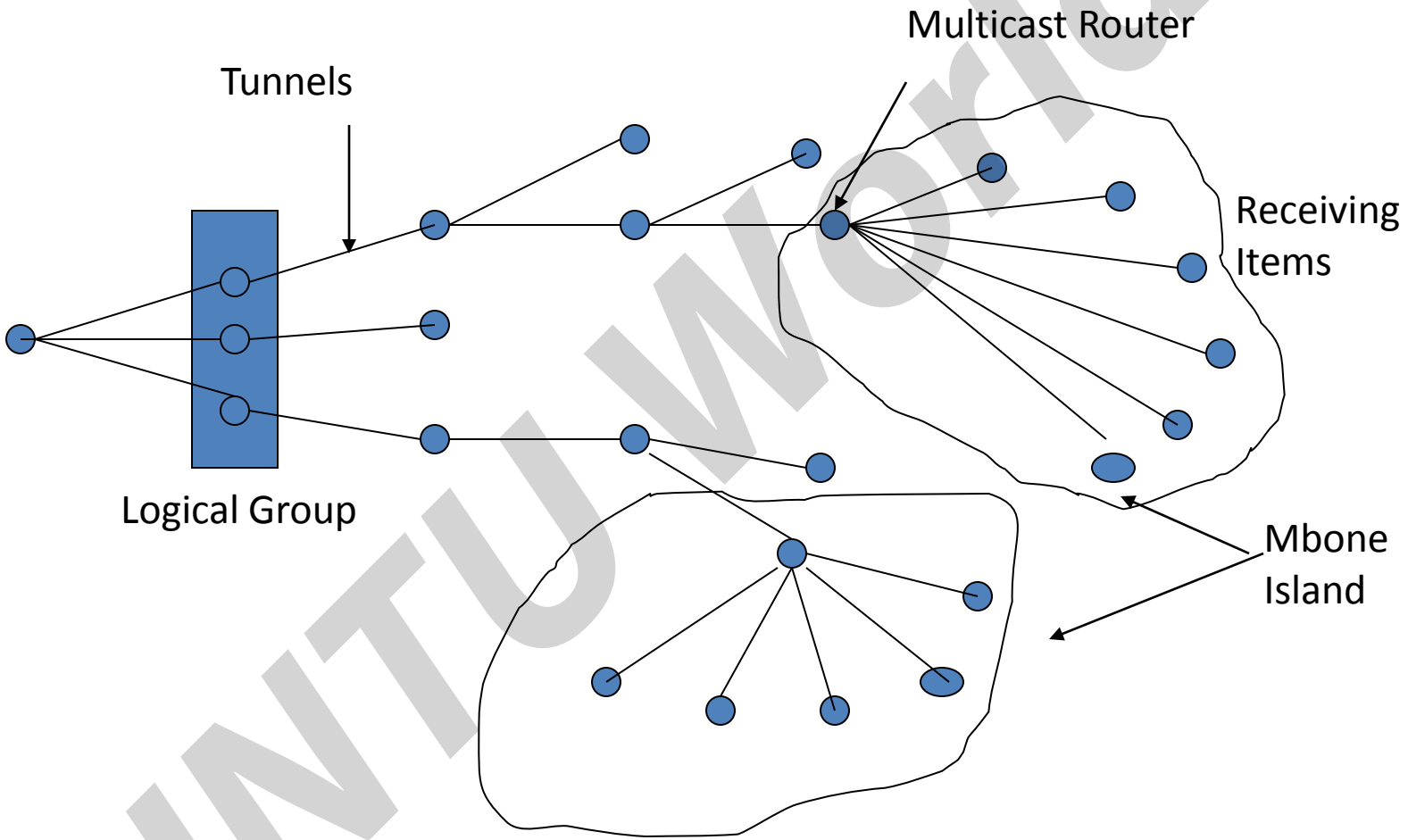
Desktop Video Conferencing



MBONE configuration

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