Department of Commerce (CA)

INTRODUCTION TO INFORMATION TECHNOLOGY

SEMESTER:I **SUB CODE:18BCA14C**

I B.COM(CA)

UNIT 4: The anatomy of E-commerce applications—commerce consumer applications-E-commerce organizations applications-components of the I way-network access equipment.

REFERENCE BOOK:

*INTRODUCTION TO INFORMATION TECHNOLOGY BY ALX LEON AND MATHEW LEON

*INTRODUCTION TO INFORMATION TECHNOLOGY BY PARAMESHWARAN

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E-COMMERCE

- 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.
- It also applies to the use of computer networks to search and retrieve information in support of human and corporate decision making
- E-commerce is associated with the buying and selling of information, products and services via computer networks.

ELECTRONIC COMMERCE FRAMEWORK

Building blocks in the infrastructure:

- Common business services for facilitating the buying and selling process
- Messaging & information distribution as a means of sending and retrieving information
- Multimedia content & network publishing, for creating a product & a means to communicate about it
- The information superhighway- the very foundation-for providing the high way system along which all e-commerce must travel

ELECTRONIC COMMERCE FRAMEWORK

Two pillars supporting all e-commerce applications & infrastructure

- 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 entire network

ELECTRONIC COMMERCE FRAMEWORK

ELECTRONIC COMMERCE FRAMEWORK

- I-way will be a mesh of interconnected data highways of many forms
  - Telephone, wires, cable TV wire
  - Radio-based wireless-cellular & satellite

- Building the highway is not enough. Transport vehicles are needed, routing issues must be addressed, and the transportation cost must be paid.
- 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

ELECTRONIC COMMERCE FRAMEWORK

- In the electronic 'highway system' multimedia content is stored in the form of electronic documents
  - These are often digitized, compressed and stored in computerized libraries or multimedia storage warehouses called servers that are linked by transport networks to each other and to the software/ hardware clients that allow customers to access them.
- On the I-way messaging software fulfils the role of moving the vehicles from one distribution warehouse to another.
  - Its done in any no. of forms: e-mail, EDI, or point-to-point file transfers

ELECTRONIC COMMERCE FRAMEWORK

- Encryption & authentication methods have been developed to ensure security of the contents while travelling the I-way and at their destination.
- Electronic payment schemes developed to handle complex transactions

- Public policy issues deal with
  - the cost of accessing information,
  - regulation to protect consumers from fraud
  - to protect their right to privacy
  - policing of global information traffic to detect information pirating or pornography
- technical standards are crucial to
  - ensure seamless and harmonious integration across the transportation network
  - access of information on any type of device the consumer chooses
    - laser disc, PCs, portable hand-held devices or television + set-top boxes and on all types of operating systems

ANATOMY OF E-COMMERCE APPLICATIONS

Elements of E-Commerce applications are:

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

ANATOMY OF E-COMMERCE APPLICATIONS

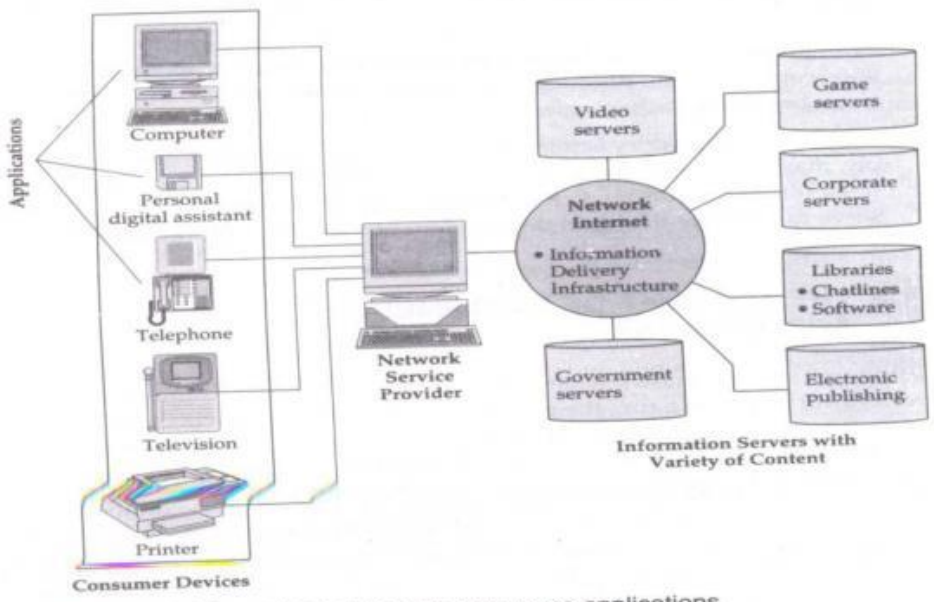


Figure 1.2 Elements of electronic commerce applications

ANATOMY OF E-COMMERCE APPLICATIONS

1. Multimedia Content for E-Commerce Applications

- Multimedia content can be considered both fuel and traffic for electronic commerce applications.
- technical definition of multimedia
  - Use of digital data in more than one format, such as the combination of text, audio, video, images, graphics, numerical data, holograms, and animations in a computer file/document.

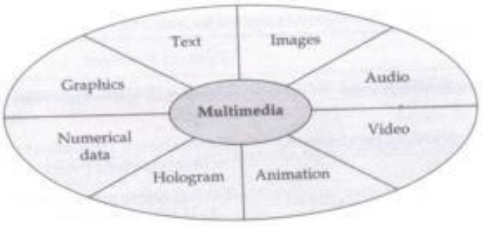


Figure 1.3 Possible components of multimedia

ANATOMY OF E-COMMERCE APPLICATIONS

1. Multimedia Content for E-Commerce Applications

- The goal of multimedia is to increase the utility of all information through the processing and distribution of new forms such as images, audio and video.
- The Accessing of multimedia content depends on the hardware capabilities of the customer.
- The success of e-commerce applications also depend ion the variety and innovativeness of multimedia content and packaging

ANATOMY OF E-COMMERCE APPLICATIONS

1. Multimedia Content for E-Commerce Applications

Industry	*Content produced*
Entertainment producers	Cartoons, games. Movies, video, music
Broadcast television productions	Game shows, documentaries, entertainment programs
Print publishing	Books, reference collections, directories, catalogs
Computer software	Software programs: animation, games, productivity – enhancing tools

ANATOMY OF E-COMMERCE APPLICATIONS

2. Multimedia Storage Servers & E-Commerce Applications:

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

ANATOMY OF E-COMMERCE APPLICATIONS

a) Client-Server Architecture in Electronic Commerce

- All e-commerce applications follow the client-server model
- Clients are devices plus software that request information from servers
- client server architecture
  - links PCs to storage server, where most of the computing is done on the client
  - allows client to interact with the server through a request-reply sequence known as message passing
- The server manages application tasks, storage & security & provides scalability-ability to add more clients and client devices

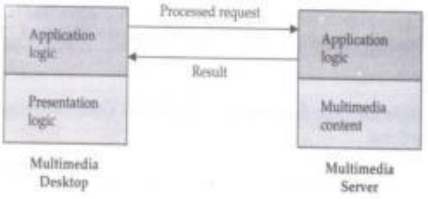


Figure 1.4 Distribution of processing in multimedia client–server world

ANATOMY OF E-COMMERCE APPLICATIONS

b) Internal Processes of Multimedia Servers

- A multimedia server is a hardware & software combination that converts raw data into usable information & then dishes out this information where and when users need it.
- It captures, processes, manages, & delivers text, images, audio & video.
- Most multimedia servers provide a core set of functions
  - to display, create and manipulate multimedia documents,
  - to transmit and receive multimedia documents over computer networks
  - to store and retrieve multimedia documents
- to make interactive multimedia a reality, a server must do the following
  - Handle thousands of simultaneous users.
  - Manage the transactions of these users (e.g. Purchases, specific information requests, customer billing)
  - Deliver information streams to consumers at affordable costs.
- Technical challenges:
  - data differ radically – no longer dealing with only table-formatted alphanumeric data
  - computing platforms pose bottlenecks when trying to deliver large pieces of complex data

ANATOMY OF E-COMMERCE APPLICATIONS

c) Video Servers & E-Commerce

- The electronic commerce applications related to digital video will include
  - Telecommunicating and video conferencing
  - Geographical information systems that require storage & navigation over maps
  - Corporate multimedia servers
  - Postproduction studios
  - Shopping kiosks.
  - Video-on-demand.
- video servers,
  - is an important link between the content providers (entertainment / media) & transport providers (wireless / cable operators)
- Designed to deliver information to hundreds of consumers simultaneously via public telecommunications and cable networks.

ANATOMY OF E-COMMERCE APPLICATIONS

3. Information Delivery/Transport & E-Commerce Applications

- Telecom-based
  - Include long-distance and local telephone service providers.
  - Using ADSL (Asymmetric Digital Subscriber line) its possible to squeeze a video signal through a telephone wire.
  - Problems
    - cannot handle live transmissions
    - Picture it produces is not as clear as that provided by a well-tuned cable hook-up.
- Cable-based
  - depend on coaxial cable and fibre optic as transport roads
- computer network-based
  - Internet; commercial on-line service providers
  - dial-up linkages of lower bandwidth when compared to telecom and cable highways
- wireless
  - radio based - Cellular , satellite
  - light based – infra-red

ANATOMY OF E-COMMERCE APPLICATIONS

4. Consumer Access Devices

Information Consumers	*Access Devices*
Computers with audio & video Mobile computing	Personal/desktop computing capabilities
Telephonic devices	Videophone
Consumer electronics	Television + set-top box Game systems
Personal digital assistants (PDAs)	Pen-based computing, voice-driven computing

E-COMMERCE CONSUMER APPLICATIONS:

- People needs
  - entertainment on demand including video, games,
  - news on-demand,
  - electronic retailing via catalogs,
  - home shopping networks,
  - interactive distance education ,
  - collaboration through desktop videoconference,
  - Medical consultations etc.
- Now the application of choice is the video on-demand because
  - 93 million homes have television
  - Americans spend nearly half their free time watching television
  - Every evening, more than one-third of the population is in front of a television
  - Sight, sound, and motion combine to make television a powerful means of marketing

E-COMMERCE CONSUMER APPLICATIONS:

Consumer Applications and Social Interaction:

- Lessons from history indicate that the most successful technologies are those that make their mark socially
  - In 1945, in U.S no one had TV. By 1960 about 86percent of households did
  - Now contrast with Telephone. Bell invented the telephone in 1876 and by1940, 40% of U.S. households and by 1980 about 95-98 percent of households connected
  - Penetration was slower for Telephone than for TV because of the effort needed to set up the wiring infrastructure
- the most successful marketplaces are expected to be those that cater to consumer's loneliness, boredom, education and career

E-COMMERCE CONSUMER APPLICATIONS:

What do Consumers really want?

- They want quality and low cost of service
- If a new system requires more steps to do essentially the same things, consumers may resist it
- Some people want to be converted from passive to interactive television watchers but most of public prefers to lay back and just watch television and let someone else do the work of figuring out the sequence of television programming

E-COMMERCE CONSUMER APPLICATIONS:

What are Consumers willing to spend?

- consider video on-demand,
  - consumers get the cable bill at basic charge which they will buy
  - If it is doubled they will not buy and the service provider economics will be increased, then network operators might look for advertisers to fill the gap

Delivering products to Consumers

- Packing and distribution must be considered

ELECTRONIC 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.
- Organizations establishing private electronic connections to customers, suppliers, distributors, industry groups, and even competitors.
  - to increase the efficiency of business communications
  - to help expand market share
  - to maintain long term viability in today's business environment.
- Electronic connections will indeed become a powerful business tool that no organization can do without.

ELECTRONIC COMMERCE ORGANIZATION APPLICATIONS

E-Commerce and the retail Industry

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

ELECTRONIC COMMERCE ORGANIZATION APPLICATIONS

Marketing and E-Commerce

- E-Commerce is forcing companies to rethink the existing ways
  - target marketing- isolating and focusing on a segment of the population
  - Relationship marketing- building and sustaining a long term relationship with existing &potential customer
  - Event marketing- setting up a virtual booth where interested people come and visit
- Interactive marketing is accomplished in electronic markets via interactive multimedia catalogs that give the same look & feel as a shopping channel.
- Users find moving images more appealing than still images and listening more appealing than reading text on screen.

ELECTRONIC COMMERCE ORGANIZATION APPLICATIONS

Inventory Management and Organizational Applications

- companies are facing stiff global competition
- Adaptation would include moving to computerized, "paperless" operations to reduce costs and facilitate the adoption of new business processes.
- One often targeted business process is inventory management, solutions for these processes go by different names
  - manufacturing industry -- known as just-in-time inventory systems,
  - retail industry as quick response programs,
  - transportation industry as consignment tracking systems

ELECTRONIC COMMERCE ORGANIZATION APPLICATIONS

a) Just-in-Time (JIT) Manufacturing

- JIT is based on 2 principles
  - elimination of waste (time, materials, labour & equipment) in the production cycle
  - empowering workers

- In a production plant the needed materials are to be supplied just in time, no earlier or later than is demanded for processing.
- Production cost will decrease as the required level of stock is reduced.
- Materials from the supplier will be ordered only if the production plant can sell its product
- Market risks are passed through the supplier chain
- All stages of production are closely monitored

ELECTRONIC COMMERCE ORGANIZATION APPLICATIONS

Quick Response Retailing (QR)

- It is a version of JIT purchasing tailored for retailing
- To reduce the risk of being of out of stock, retailers are implementing QR systems
- It 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
- It creates a closed loop consisting of retailer, vendor, & consumer chain,
- as consumers make purchases the vendor orders new deliveries from the retailer through its computer network

ELECTRONIC COMMERCE ORGANIZATION APPLICATIONS

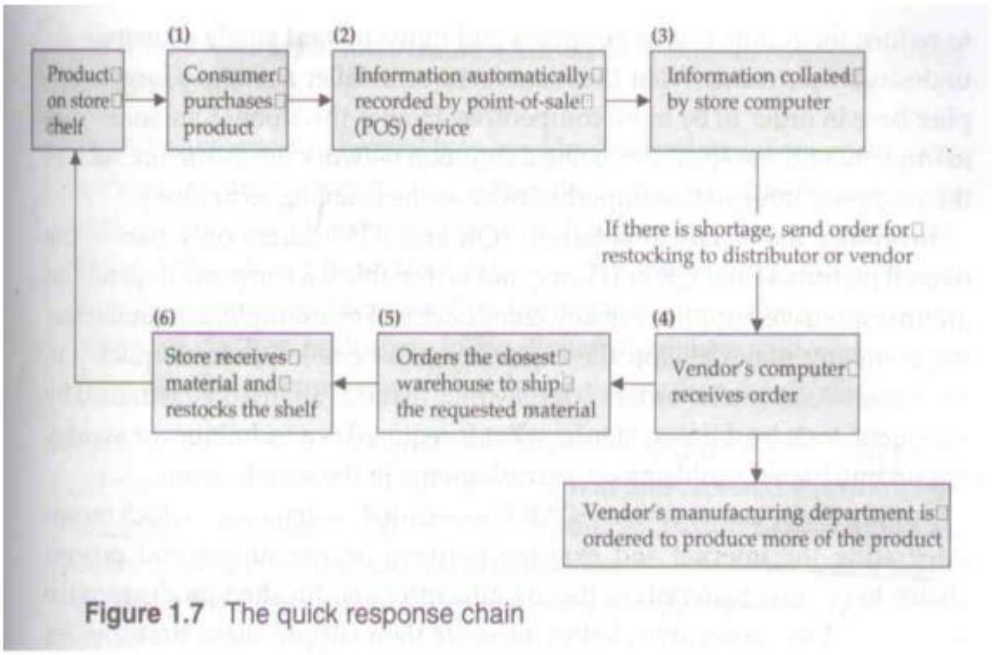


Figure 1.7 The quick response chain

ELECTRONIC COMMERCE ORGANIZATION APPLICATIONS

Supply Chain Management

- Supply Chain Management (SCM) is also called "extending", which means integrating the internal and external partners on the supply and process chains to get raw materials to the manufacturer and finished products to the consumer
- It includes following functions
  - Supplier management- to reduce the number of suppliers
  - Inventory management - to shorten the order-ship-bill cycle.
  - Distribution management: - to move documents related to shipping (bills of loading, purchase orders, advanced ship notices and manifest claims)
  - Channel management: - to quickly disseminate information about changing operational conditions (technical, product, and pricing information) to trading partners
  - Payment management: - to link company and the suppliers and distributors so that payments can be sent and received electronically
  - Financial management: - to enable global companies to manage their money in various foreign exchange accounts
  - Sales force productivity: to improve the communication flow of information among the sales, customer & production functions

ELECTRONIC COMMERCE ORGANIZATION APPLICATIONS

Work group Collaboration Applications:

- An internetwork that enables easy and inexpensive connection of various organizational segments
- It is to improve communications and information sharing and to gather and analyze Competitive data in real-time
- also facilitates sales force automation by enabling sales people to carry product and reference information in one portable device
- Videoconferencing, document sharing and multimedia e-mail, are expected to reduce travel and encourage telecommuting
- Improves the distribution channel for documents and records to suppliers, collaborators and distributors

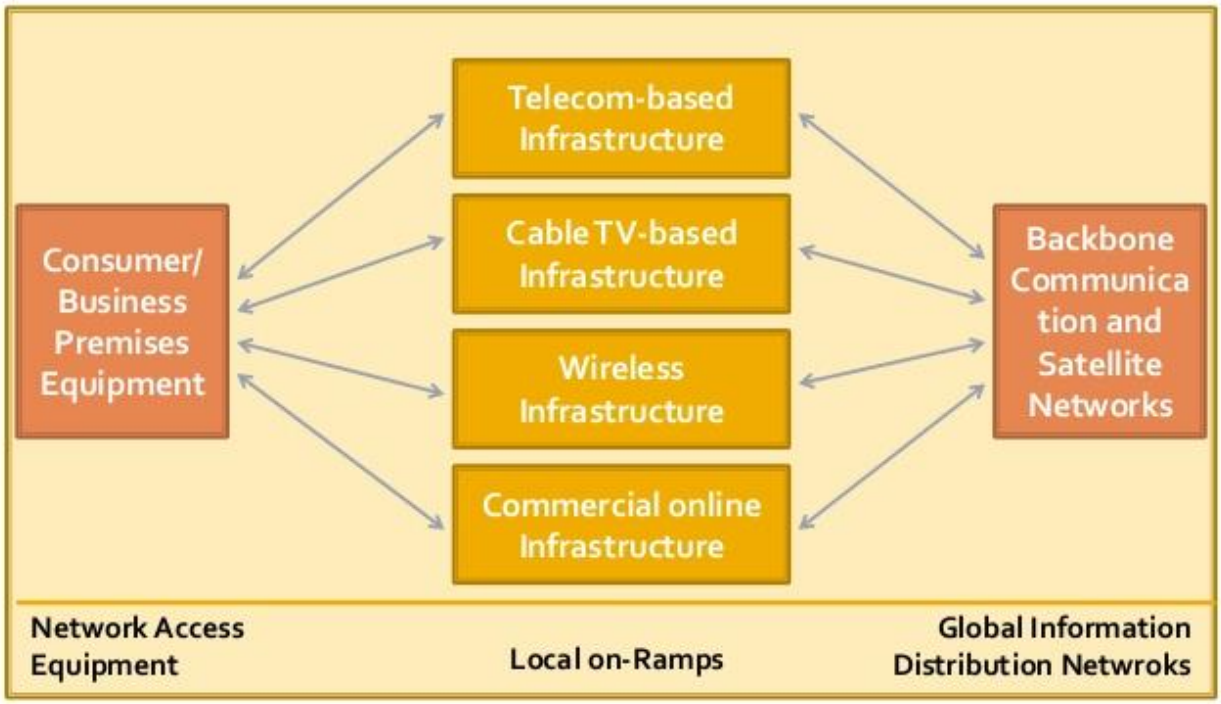
Introduction to I-Way

- a physical network, an infrastructure of modern high-speed links
- links everyone at home or office to everything else
- in practicality it is identical to internet provided -connections are broadband -they are continuously running
- as internet develops into I-way, changes will take place in infrastructure not in internet

I-Way: Definition

Information Superhighway is a high-speed global communications network that can carry data, voice, video and other services around the world using technology such as the satellite, optical fibre and cellular telecommunications.

Components of I-Way



Components of I-Way

LOCAL ON-RAMPS

- wiring linking homes with backbone
- requirement of huge investment
- also known as "last mile"
- divided into four categories:
  - telecom based infrastructure
  - cable tv-based infrastructure
  - wireless infrastructure
  - commercial online infrastructure

Components of I-Way

NETWORK ACCESS EQUIPMENT

- hardware and software vendors: *who provide*
  - set-top boxes
  - computers
  - switches, hubs, routers
  - software platforms such as browser operating systems

Components of I-Way

GLOBAL INFORMATION DISTRIBUTION NETWORK

- long distance network
- satellite networks