→ What is E-commerce? List characteristics of E-commerce.

The term e-commerce is defined as the trading of goods, services, information or anything else of value between two entities over the Internet.

It is the ability to conduct business over the Internet. It is the platform for buying and selling products and services via Internet.

Characteristics (features):

- Establishment of B to B relationship.
- Electronic payment
- Electronic distribution of products and services
- Exchange of information
- Pre and post sales support
- Customer relationship management
- Mobile friendly

→ List aims and limitations of E-commerce.

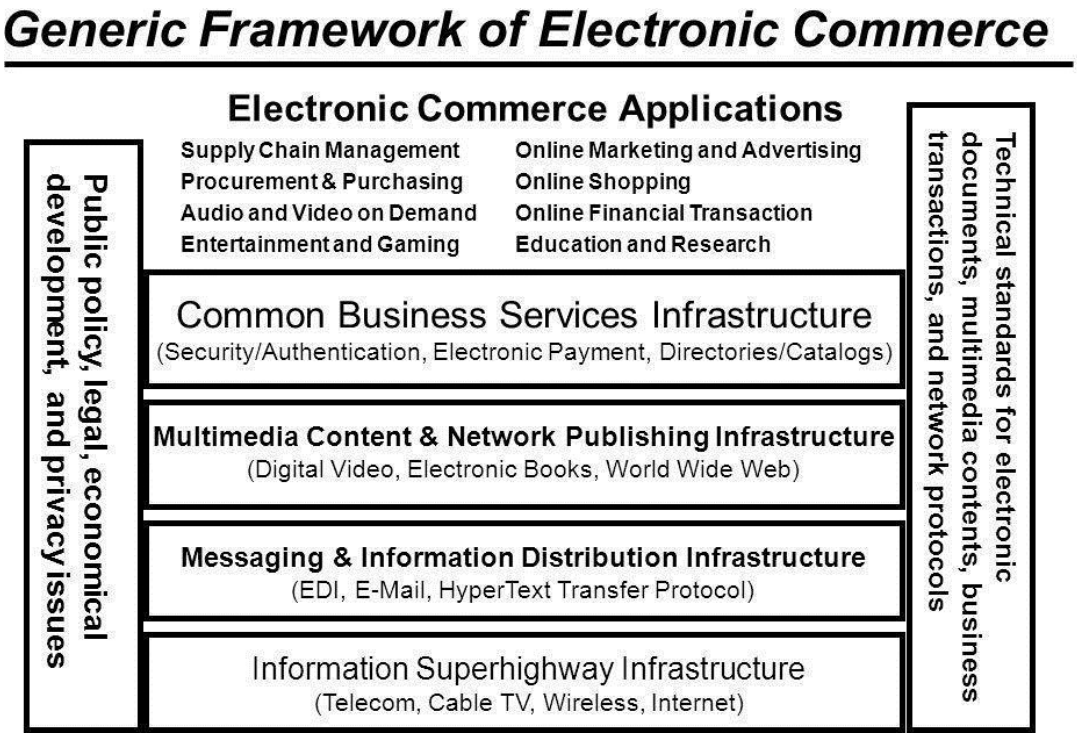
Aims (benefits) of E-com:

- Facilitates the globalization of business
- Provides increased purchasing opportunities for the buyers
- Low staffing cost
- Market based expansion
- Increased profits
- Increased customer service and loyalty
- Increased speed and accuracy
- Reduction of paper use and storage
- Increased response time

Limitations of E-com:

- Low security
- High startup cost
- Legal issues
- Lack of skilled personnel
- Loss of face to face contact with customers
- Uncertainty and lack of information
- Some business process may never be available to E comm.

→ **Write a note on E-commerce architectural framework**



There are four building blocks:

1. The I-Way
2. Multimedia content and network publishing infrastructure
3. Messaging and info distribution infrastructure
4. Common business services infrastructure

There are two supporting pillars to support all four building blocks

1. Public policy and cyber law
2. Technical standards and protocols

1. Public policy and cyber laws

- There are various public policies in place by government authorities and governing bodies for electronic commerce.
- Most of the policies are same worldwide but a few might differ country to country.
- There are cyber laws in place to secure activities on e-com & penalize those who break cyber laws.

- Electronic content that falls under category of intellectual property needs security and authentication for use. Also some data is private to its owner. This pillar provides protection to such data.

2. Technical standards & network protocols

- There are different technical standards required to implement different consumer and business e-com applications:

- Secure payment system.
- Mobile friendly websites and store fronts.
- Integration to third party applications.
- Security tools like digital signature and digital certificate.
- Customer support systems.

- Apart from these there are various network protocols that provide secure information exchange, authentication and encryption are used. For example HTTPS, SSL, IPSEC, VPN etc.

Four building blocks

1. I-way (Information Super Highway)

- I-way is the basic building block for E-comm. It is made of different networks available worldwide.
- Telecommunication networks, cable TV networks, cellular networks and other wireless networks like satellite network, fiber optic network etc.
- These networks are interconnected to form internet that supports high speed information exchange worldwide.

2. Multimedia content and network publishing infrastructure

- Publishing infrastructure for different e-com websites and applications is also considered a building block.
- It mainly contains different servers like application server, web server, online gaming servers, news servers, video servers and clients like e-com websites, online payment and fund transfer applications and more.
- So in general, the client – server, peer to peer and hybrid information publishing system provides this infrastructure.

3. Messaging and information distribution infrastructure

- With the advancement of e-com technology the new field of information distribution has emerged.
- It is a tedious task to search a product of information from different websites of e-com applications, but when the required information is made available at one place, the job becomes easier.
- There are many examples of information distributor sites like trivago, makemytrip, goibibo for booking trip and hotels. Swiggy and zomato for ordering food etc.

4. Common business services

- The fourth building block is business services which are essential for e-com, like security and authentication is a must have services in order to conduct any e-com transaction.
- The technologies involved are cryptography, secure protocols, digital signature and certificate etc.
- Another service is electronic payment system, that involves integration among banks, third party payment gateway companies like phonePe, Gpay, payTM, and government bodies like RBI.

These two pillars and four building blocks provide safe and secure infrastructure for e-com applications. E-com applications are categorized in consumer applications and business applications.

E-com consumer applications:

- Remote banking
- Home shopping
- Video on demand

E-com organizational applications:

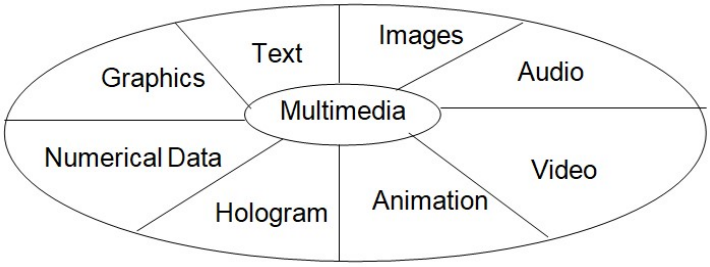
- SCM (Supply Chain Management)
- JIT (Just In Time) manufacturing
- Online procurement and purchasing
- CRM (Customer Relationship Management)
- ERP (Enterprise Resource Planning)

→ Importance of Multimedia for E-com applications

Multimedia is both fuel and traffic for E-com Applications

Technical Definition: Use of digital data in more than one format, such as combination of text, audio, video and graphics in a computer file/document.

Figure: Possible Components of Multimedia



Purpose of Multimedia:

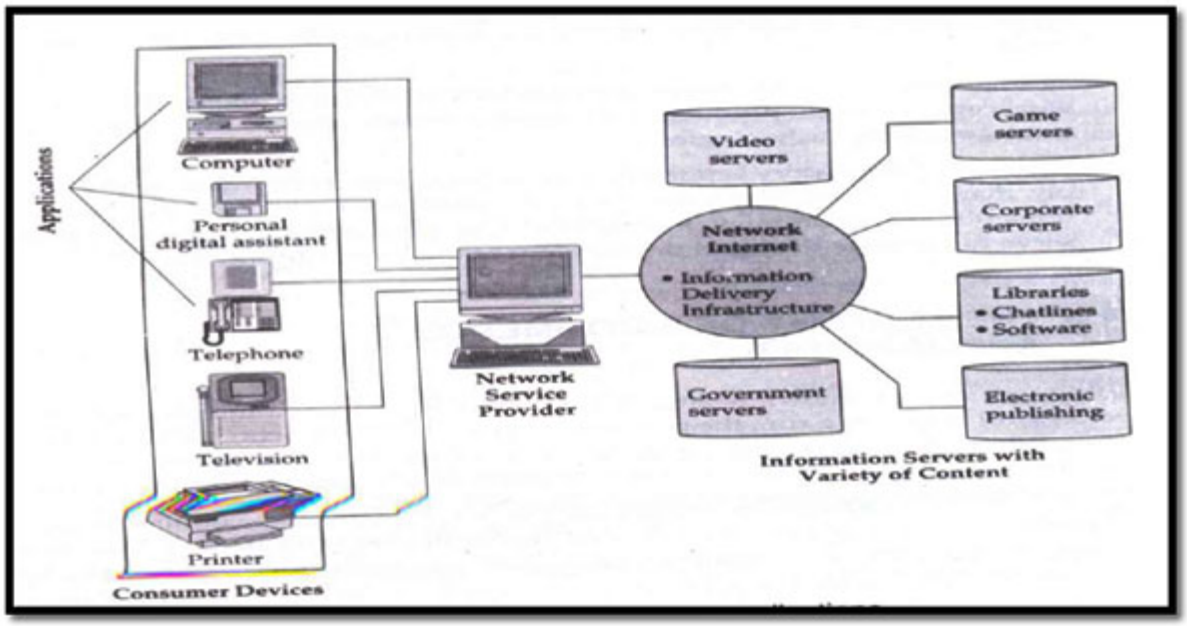
- To combine the interactivity of a user-friendly interface with multiple forms of contents.
- Multimedia is associated with the hardware convergence-taking place in the telecommunications, computer, and cable industry.
- It has come to mean the combination of computers, television and telephone capabilities in a single device.

Goals of Multimedia:

- To increase the utility of all information through the processing and distribution of new forms such as images, audio and video.
- Multimedia represents next generation of computing.
- It covers so many things that it is often difficult to conceptualize.
- Telecommunications, cable/broadcasters, and computer software and hardware providers each have a different view of what multimedia means.
- In multimedia, every form of content is interrelated to other forms (e.g. an electronic book contains text, photographs, voice, video clips, animation and host of other things.)

Access to multimedia content depends on the hardware capabilities of the customer.

→ Elements of E-com applications



1. Consumer Devices
    - Computers
    - PDAs
    - Telephones & smart phones
    - Smart TVs
    - Printers
2. Network Service Providers (ISPs)
3. Network and Internet (The I-way)
4. Information Servers and other Servers
    - Video Servers
    - Game Servers
    - Mail Servers
    - Government servers
    - Software servers

E-Comm. Organizational Applications

→ Just-in-Time Manufacturing:

• It is viewed, as an integrated management system, consisting of a number of different management practices, is dependent on the characteristics of specific plants.

• JIT management system is based on two principles: -

– Elimination of waste (time, materials, labor and equipment) in production cycle.

– Empowering workers

• Management practices associated with JIT systems:

– Focused factory

– Reduced set-up times

– Group technology

– Total productive maintenance

– Multifunction employees

– Uniform workloads

– JIT purchasing

– Total quality control

– Quality circles

→ JIT purchasing

– Allows a manufacturer to incorporate its supplier efforts toward eliminating waste in the upstream portion of the manufacturing cycle.

– Focuses on the reduction of inventories throughout the logistical systems of the manufacturing firms involved

– Provides a careful audit of the production process.

– Optimizes supplier and customer relations

– In production, needed materials are to be supplied just in time (no earlier or later than is demanded for processing)

– Production costs decrease as required stock level is reduced.

– Market risks passed on through supplier chain (material from supplier is ordered by production plant, only if products can be sold)

– Quality control of production is considerably enhanced.

– All stages of production are closely monitored for adequate assessment of imperfections.

– Concept of co-maker ship has been introduced by such collaboration between suppliers and customers.

– To achieve JIT savings, corporations have installed private communication networks. The I-way makes this practice more affordable and easily available to a number of small firms.

→ Quick Response Retailing

• Quick Response (QR) is JIT purchasing version for retailing.

• Most often, shoppers do not keep a store filled with merchandise until the wanted product is out of stock.

• The failure to stock merchandise that matches customer demand can be extremely costly.

• To reduce risk of being out of stock, retailers are implementing QR systems.

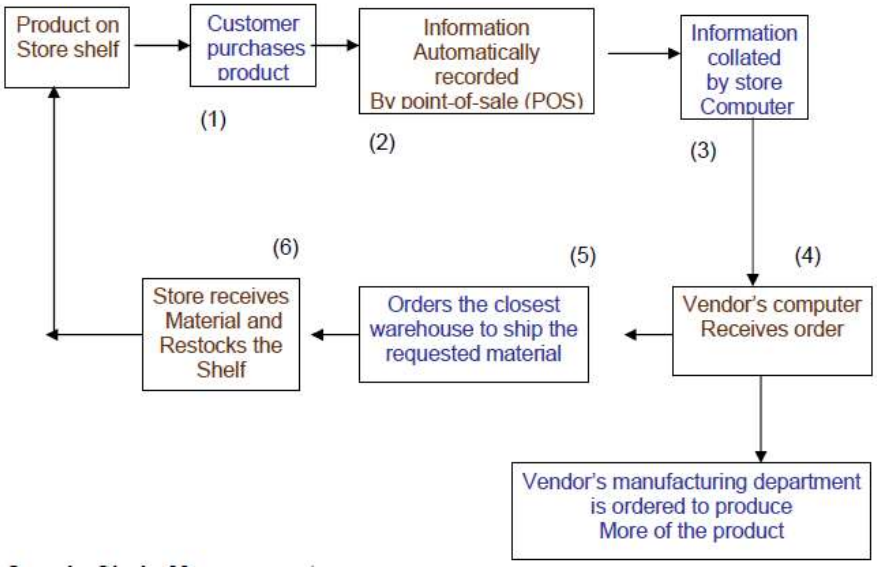
• QR provides a flexible response to product ordering & lowers costly inventory levels.

• QR retailing focuses on market responsiveness while maintaining low level of stocks.

• It creates a closed loop encompassing the retailer, vendor, and customer chain (Fig: Quick Response Chain)

• Availability of accurate information with respect to the current sales enables sophisticated marketing capable of responding to consumer's preferences.

Quick Response Retailing
Quick Response Chain



→ Supply Chain Management (SCM)

• Inventory management solutions (QR & JIT) address only part of the overall picture.

• These may not be feasible if a company depends on an unresponsive supplier for key components.

• What is required is a technique for managing unanticipated problems (or perturbations) in the supply chain.

• Supply Chain management (SCM) integrates the internal and external partners on the supply and process chains

– to get raw materials to the manufacturer and finished products to the consumer.

• SCM process increasingly depends on electronic markets because of:

– Global sourcing of products and services to reduce costs

– Short product life cycles

– Increasingly flexible manufacturing systems resulting in a variety of customizable products.

Functions:

• Supplier Management

– The goal is "to reduce number of suppliers and get them to become partners in business in a win/win relationship."

– Benefits:

• Reduced purchase order (PO) processing costs

• Increased number of POs processed by fewer employees

• Reduced order processing cycle times.

• Inventory Management

– The goal is "to shorten the order-ship-bill cycle."

– Majority of partners are electronically linked, information can be sent/received quickly.

– Documents can be tracked to ensure they were received.

– Benefits:

• Improved Audit Capabilities. (Documents can be tracked to ensure they were received).

• Enable the reduction of inventory levels

• Improve inventory turns

• Eliminate out-of-stock occurrences.

• **Distribution Management**

– The goal is "to move documents related to shipping (bills of lading, purchase orders, advanced ship notices, and manifest claims)"''''''''''''

– Benefits:

• Improved Resource planning (Documents can be sent in moment and contain accurate data).

• **Channel Management**

– The goal is "to quickly disseminate information about changing operational conditions to trading partners."

– Benefits:

• Technical products and pricing information can be posted to electronic bulletin boards, thus allowing instant access.

• Electronically linking production with their international distributor and reseller networks eliminate thousands of labor hours per week in the process.

• **Payment Management**

– The goal is "to link the company and the suppliers and distributors so that payments can be sent and received electronically."

– Benefits:

• Increased speed at which companies can compute invoices.

• Reduced clerical errors

• Lower transaction fees and costs with increasing productivity (number of invoices processed)

• **Financial Management**

– The goal is "to enable global companies to manage the money in various foreign exchange accounts."

– Companies must work with financial institutions to boost their ability to deal on a global basis.

– They need to assess their risk and exposure in global financial markets

– They need to deal with global info as opposed to local market information.

• **Sales Force Productivity**

– The goal is "to improve the communication and flow of information among the sales, customer and production functions."

– Linking the sales force with regional and corporate offices establishes greater access to market intelligence and competitor information that can be funneled into better customer service and service quality.

– Companies need to collect market intelligence quickly and analyze it more thoroughly.

– Companies also need to help their customers (relationship management) introduce their products to market faster, giving them a competitive edge.

→ Work Group Collaboration Applications

• For workgroup applications, e-com represents a ubiquitous inter-network,

– That enables easy and inexpensive connection of various organizational segments

– To improve communication and information sharing among employees and to gather and analyze competitive data in real-time.

• E-com also facilitates sales force automation by enabling salespeople to carry product and reference information in one portable device.

• Applications such as video-conferencing, document sharing, and multimedia e-mail are expected to reduce travel and encourage telecommuting.

• Improving the distribution channel for documents and records to suppliers, collaborators and distributors can reduce processing costs.

• Video conferencing is now the best-established application.

• Organizational applications of e-com have to meet the challenges of new business environment, where the emphasis is on service quality, flexibility and customization of production to meet customer needs.

→ Video-conferencing (Work Group Collaboration Applications)

• It allows distant business colleagues to communicate without the expense, time and inconvenience of traveling.

• In hospitals, it allows surgeons to examine computerized X-rays and CAT scans of distant patients whose doctors need second opinion.

• Its appeal and applicability to small business is limited because it:

– Requires of significant investment in equipment

– Entails the use of dedicated facilities with special communication lines.

• It is beginning to penetrate the desktop PC market (limited growth due to technical limitations)

• Faster chips for processing video (compressing and decompressing) are required.

• As the point-to-point or point-to-multipoint video conferencing drops, it is expected to continue its penetration into the corporate marketplace.

→ ERP (Enterprise Resource Planning)

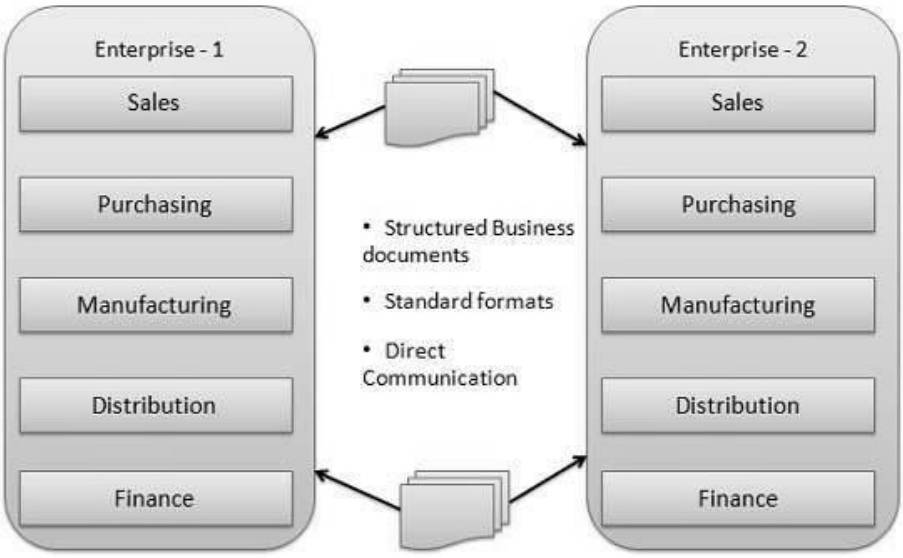
Self study

→ Digital marketing and advertisement

Self study

→ EDI (Electronic Data Interchange)

EDI stands for Electronic Data Interchange. EDI is an electronic way of transferring business documents in an organization internally, between its various departments or externally with suppliers, customers, or any subsidiaries. In EDI, paper documents are replaced with electronic documents such as word documents, spreadsheets, etc.



EDI Documents

Following are the few important documents used in EDI –

• Invoices

• Purchase orders

- Shipping Requests
- Acknowledgement
- Business Correspondence letters
- Financial information letters

Steps in an EDI System

Following are the steps in an EDI System.

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

Advantages of an EDI System

Following are the advantages of having an EDI system.

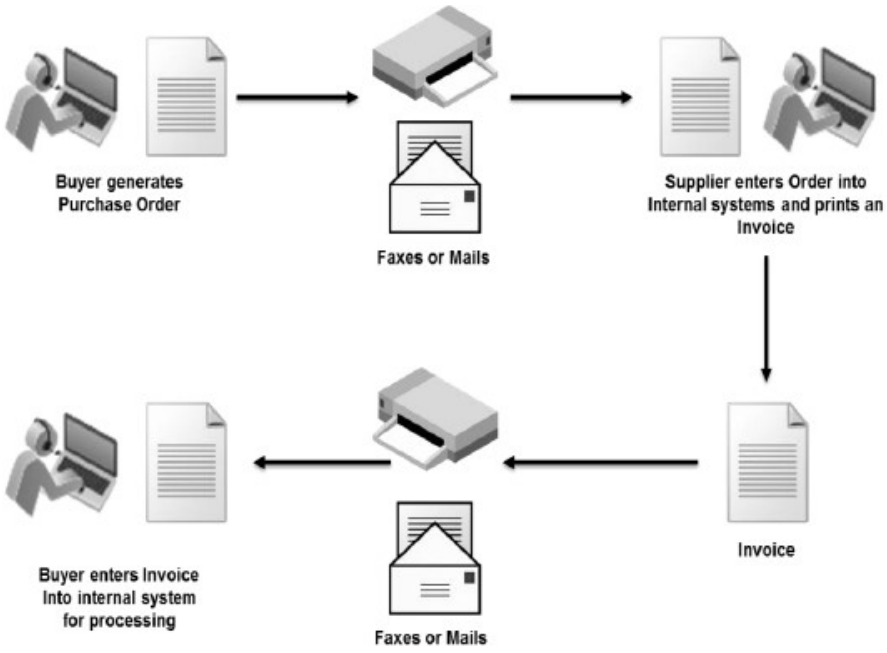
- Reduction in data entry errors. − Chances of errors are much less while using a computer for data entry.
- Shorter processing life cycle − Orders can be processed as soon as they are entered into the system. It reduces the processing time of the transfer documents.
- Electronic form of data − It is quite easy to transfer or share the data, as it is present in electronic format.
- Reduction in paperwork − As a lot of paper documents are replaced with electronic documents, there is a huge reduction in paperwork.
- Cost Effective − As time is saved and orders are processed very effectively, EDI proves to be highly cost effective.
- Standard Means of communication − EDI enforces standards on the content of data and its format which leads to clearer communication.

Disadvantages of Traditional EDI:

The benefits of traditional EDI were compelling, and it was embraced quickly by large businesses, but it did not fit the needs of small to mid-sized companies. Here are the key reasons why:

Expense:

Early EDI business applications were complex and expensive. Primarily serving peripheral functions, they were not fully integrated into all business activities. So although there were substantial savings to be gained from EDI, the cost of re-designing software applications to integrate EDI into existing business applications offset the cost advantages.



Network complexity:

The need for extensive telecommunications capability posed a second major barrier to widespread EDI implementation for small to mid-sized companies. Beyond the computer itself, a basic requirement of EDI is a means to transmit and receive information to and from a wide variety of customers or suppliers. This required a heavy investment in computer networks. Unlike the mail, to send electronic documents there must be a specific point-to-point electronic path for the document to take. So companies were either required to develop extensive and expensive networks, or rely on intermittent point-to-point modem communication.

Electronic System Safety: EDI also necessitates substantial investment in computer networks and security systems for maximum security. Any EDI system installed would require protection from hacking, malware, viruses, and other cyber security threats.

→ What is the difference between Email and EDI?

Self Study

E-Comm. Consumer Applications

→ Net Banking (online banking / home banking / remote banking)

→ Tele Shopping (online shopping / home shopping)

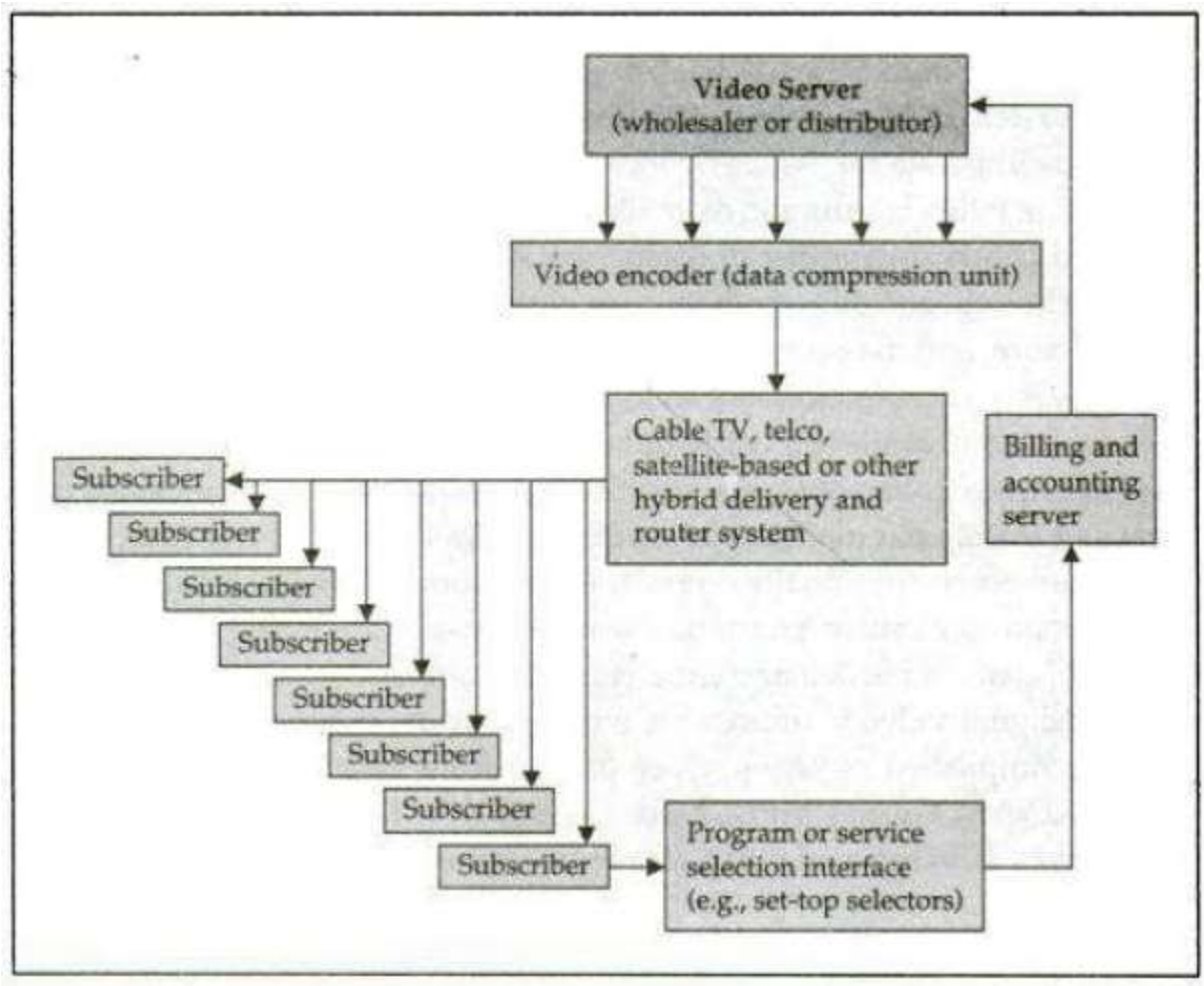
→ Online ticket booking

→ Online bill payment and fund transfer

→ Video on demand

→ C2C e-com. Applications (OLX and Quickr)

→ Video on demand



Block diagram of generic Video On Demand System

- Video on demand is one of the popular e-com consumer applications. The objective of this application is to provide videos, movies and TV shows to consumers as and when they need on rental basis.
- Here consumer gets an interface where he/she selects from the list of videos to watch and they are asked to pay respective amount.
- This request is received and processed by billing and accounting server, and on successful payment the request is sent further to video server.
- The video server performs the task of storing, managing and controlling the live stream of videos to respective customers.
- There is a video encoder in the network that performs the task of data compression based on the need and device specification of consumer. Then the data (video) stream is passed on to the I-way (the internet) in order to further distribute videos to respective consumers.
- Today the popular examples of this system are Netflix, Disney plus Hotstar, Amazon Prime Video etc.

→ Limitations of E-Commerce

Technical Limitations

-Lack of sufficient system's security, reliability, standards, and communication protocols

-Insufficient telecommunication bandwidth

-The software development tools are still evolving and changing rapidly

Non Technical Limitations

-Security and Privacy

•These issues are especially important in the B2C area, and security concerns are not truly so serious from a technical standpoint Privacy measures are constantly improving too.

•Yet, the customers perceive these issues as very important and therefore the EC industry has a very long and difficult task of convincing customers that online transactions and privacy are, in fact, fairly secure.

-Lack of trust and user resistance

•Customers do not trust an unknown faceless seller, paperless transactions, and electronic money. So switching from a physical to a virtual store may be difficult.

→ Introduction to m-Commerce

The phrase mobile commerce was originally coined in 1997 by Kevin Duffey at the launch of the Global Mobile Commerce Forum, to mean "the delivery of electronic commerce capabilities directly into the consumer's hand, anywhere, via wireless technology."

M-commerce (mobile commerce) is the buying and selling of goods and services through wireless handheld devices such as cellular telephone and personal digital assistants (PDAs).

Advantages of mobile commerce

Mobile commerce offers a range of advantages to businesses both large and small. The number of people owning and regularly using mobile devices continues to grow, providing a large - and growing - marketplace for a variety of goods and services.

1. Wide reach

Mobile commerce allows consumers to buy, and be marketed to, wherever they can get an internet connection. This offers considerable advantages over ecommerce, which must rely on a traditional internet connection such as over Ethernet. Improvements to infrastructure are increasing the speed and reliability of mobile internet access, making mobile commerce a sure-fire growth industry in the short and medium term future.

2. The personal touch

Selling over mobile devices can yield a very personal encounter for the consumer, especially if the services and products you offer are individually tailored. Mobile devices are often kept very close and so by providing the right kind of service retailers can capture the attention of consumers more easily. This form of commerce can bring the consumer and the company together and bring about greater profits for the company and allow the customer to have a closer relationship with the company.

3. Reduced need for skilled consumers

Mobile commerce reduces the need for the consumer to have certain skills (e.g. be able to use search engines or online checkout processes)

4. Easy to use

There is no need of skilled consumer. Buyers can have look thousands of items on their cell phones and there is no need of online checkout process.

5. Time Efficient

Doing M-Commerce transactions do not require the users to plug anything like personal computer or wait for the laptop to load.

Disadvantages

Mobile commerce is a growing sector and analysts expect significant growth in the next few years. At the current time there are some disadvantages from a retailer's point of view.

1. Smaller screens

The smaller and less vivid screens of mobile devices give less of an opportunity for retailers to sell products with eye-catching images and graphic design. In fact, the amount of marketing collateral [guarantee] that can be delivered is reduced.

2. Investment in growing market

Business investment in mobile commerce can be risky due to the rapid-fire pace of the market and its ability to shift quickly.

3. Speed of delivery

Mobile devices are less powerful than personal computers which mean mobile websites must be optimized for the technology. This means a potentially reduced appeal, in addition to the man-hour costs of removing inappropriate content such as flash videos and plug-ins.

4. Security

Although mobile security is improving regularly, there is still reluctance among some consumers to conduct transactions over a mobile device. Likewise, wireless networks - particularly those with widespread access such as mobile phone networks opportunities for hackers than the standard 'internet'.

5. Difficult user interface

There is often a learning curve when it comes to handheld devices. Mobile websites and commerce gateways must be built with usability in mind, to reduce the number of customers who abandon [dump] the purchase due to frustration, and this can add significantly to the cost.

6. Smart phone limitation

Mobile has no big screen like desktop or laptops, so sometimes users tried to navigate more and more to choose just one item from thousands. It affects shopping rates.

7. Connectivity: Mobile commerce needs high speed connectivity of 3G. Otherwise it is become hectic for user to go through entire product purchase process.