

Unit-1

Definition:

E-commerce (electronic commerce) is the activity of electronically buying or selling of products on online services or over the Internet.

Ecommerce refers to the paperless exchange of business information using the following ways –

- Electronic Data Interchange (EDI)
- Electronic Mail (e-mail)
- Electronic Bulletin Boards
- Electronic Fund Transfer (EFT)
- Other Network-based technologies

Features:

E-Commerce provides the following features –

- **Non-Cash Payment** – E-Commerce enables the use of credit cards, debit cards, smart cards, electronic fund transfer via bank's website, and other modes of electronics payment.
- **24x7 Service availability** – E-commerce automates the business of enterprises and the way they provide services to their customers. It is available anytime, anywhere.
- **Advertising / Marketing** – E-commerce increases the reach of advertising of products and services of businesses. It helps in better marketing management of products/services.
- **Improved Sales** – Using e-commerce, orders for the products can be generated anytime, anywhere without any human intervention. It gives a big boost to existing sales volumes.
- **Support** – E-commerce provides various ways to provide pre-sales and post-sales assistance to provide better services to customers.
- **Inventory Management** – E-commerce automates inventory management. Reports get generated instantly when required. Product inventory management becomes very efficient and easy to maintain.
- **Communication improvement** – E-commerce provides ways for faster, efficient, reliable communication with customers and partners.
- Traditional Commerce v/s E-Commerce

Advantages of Ecommerce:

E-Commerce advantages can be broadly classified in three major categories –

- Advantages to Organizations
- Advantages to Consumers
- Advantages to Society

Advantages to Organizations:

- Using e-commerce, organizations can expand their market to national and international markets with minimum capital investment. An organization can easily locate more customers, best suppliers, and suitable business partners across the globe.
- E-commerce helps organizations to reduce the cost to create process, distribute, retrieve and manage the paper based information by digitizing the information.
- E-commerce improves the brand image of the company.
- E-commerce helps organization to provide better customer services.
- E-commerce helps to simplify the business processes and makes them faster and efficient.
- E-commerce reduces the paper work.

Advantages to Customers:

- It provides 24x7 support. Customers can enquire about a product or service and place orders anytime, anywhere from any location.
- E-commerce application provides users with more options and quicker delivery of products.
- E-commerce application provides users with more options to compare and select the cheaper and better options.
- E-Commerce increases the competition among organizations and as a result, organizations provides substantial discounts to customers.

Advantages to Society:

- Customers need not travel to shop a product, thus less traffic on road and low air pollution.
- E-commerce has enabled rural areas to access services and products, which are otherwise not available to them.
- E-commerce helps the government to deliver public services such as healthcare, education, social services at a reduced cost and in an improved manner.

The **disadvantages of e-commerce** can be broadly classified into two major categories –

- Technical disadvantages
- Non-Technical disadvantages

Technical Disadvantages:

- There can be lack of system security, reliability or standards owing to poor implementation of e-commerce.
- The software development industry is still evolving and keeps changing rapidly.
- In many countries, network bandwidth might cause an issue.
- There could be software/hardware compatibility issues, as some e-commerce software may be incompatible with some operating system or any other component.

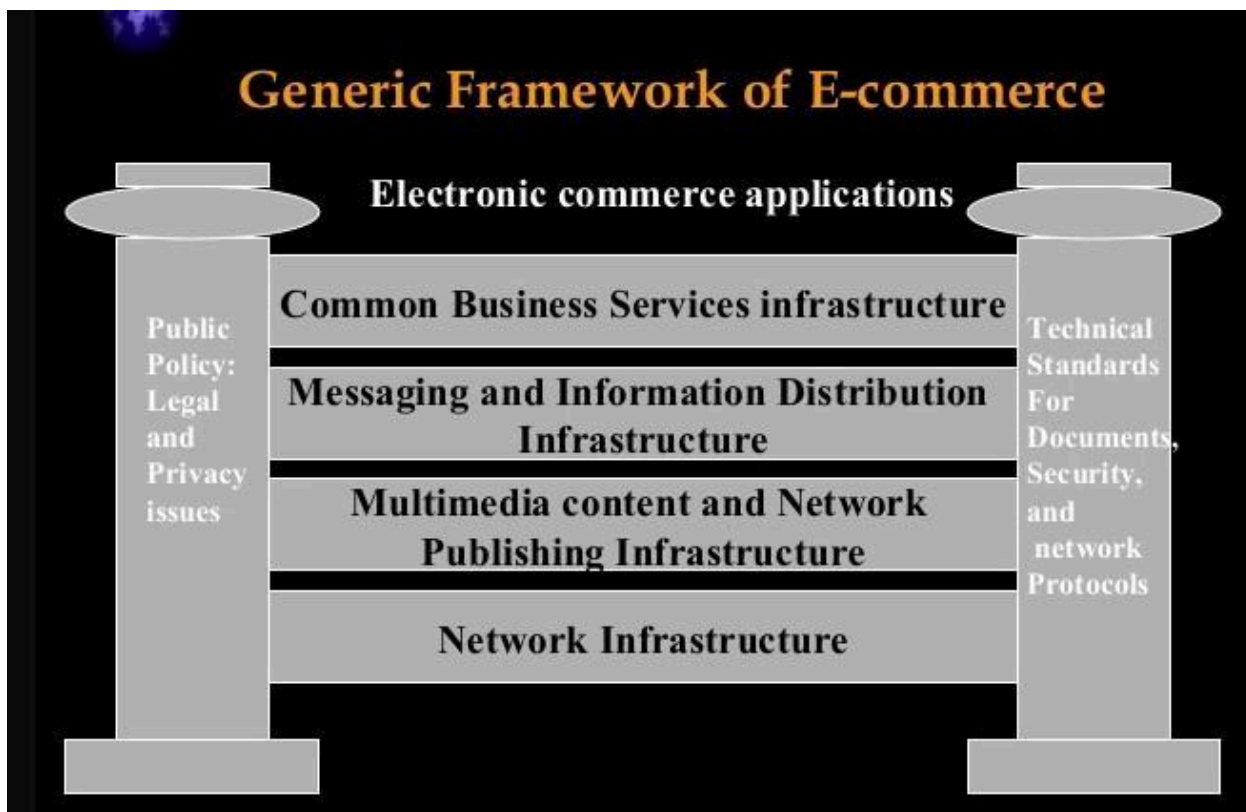
Non-Technical Disadvantages:

- **Initial cost** – The cost of creating/building an e-commerce application in-house may be very high.
- **User resistance** – Users may not trust the site being an unknown faceless seller.
- **Security/ Privacy** – It is difficult to ensure the security or privacy on online transactions.
- Lack of touch or feel of products during online shopping is a drawback.
- Internet access is still not cheaper and is inconvenient to use for many potential customers, for example, those living in remote villages.

Business Application of E-commerce:

- Conversational commerce: e-commerce via chat
 - Digital Wallet
 - Document automation in supply chain and logistics
 - Electronic tickets
 - Enterprise content management
 - Group buying
 - Instant messaging
 - Newsgroups
 - Online banking
 - Online office suites
 - Online shopping and order tracking
 - Pretail
 - Print on demand
 - Shopping cart software
 - Social networking
 - Teleconferencing
 - Virtual assistant (artificial intelligence)
 - Domestic and international payment systems
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Electronic commerce Framework:



Common business infrastructure:

- The common business infrastructure for electronic commerce consists of four main elements:

- ☐ Security
- ☐ Authentication
- ☐ Encryption
- ☐ Electronic Payments

Security:

- Major concern for doing business on the Internet.
- Businesses feel vulnerable to attack.
- Encryption is used to help secure data.
- HTTPS (HTTP with SSL) is used to encrypt data to ensure its integrity and safety.

Authentication:

- Authentication is the security process of verifying that a user is who he or she says they are.
- Passwords are the most common type of authentication.
 - ☐ It is important that users understand strong passwords.
- Digital signatures are now gaining popularity for authenticating transmitted information.

Encryption:

- Encryption systems translate data into a secret code (many types of encryption used).
- Encryption systems include 4 main components:
 - ☐ **Plaintext:** the unencrypted message
 - ☐ An **encryption algorithm:** that works like the locking mechanism to a safe
 - ☐ A **key** that works like the safe's combination
 - ☐ **Ciphertext** is produced from the plaintext message by the encryption function.
 - ☐ **Decryption** is the same process in reverse (like a modulation/demodulation), but it doesn't always use the same key or algorithm. Plaintext results from decryption.

Messaging and Information Distribution Infrastructure

- Second building block of supporting framework for e-commerce.
- Includes email, instant messaging, Voice over IP (VoIP), point-to-point file transfers (FTP), and groupware.

- E-mail is still largest use in this area.
 - ☐ ISP (Internet Service Provider) connects the user to the Internet.

Multimedia content and Network Publishing Infrastructure

- Third building block of supporting framework for e-commerce. Includes standards for various multimedia file types. Examples of materials transported in this way include:
 - ☐ Video
 - ☐ Audio
 - ☐ Text/Electronic documents
 - ☐ Graphics & Photos
 - ☐ Realtime/Non-realtime applications

Network Infrastructure:

- Fourth building block of supporting framework for e-commerce. Includes data communications circuits over which information travels. Includes:
 - ☐ Packet-switched networking (telephony is circuit-switched)
 - ☐ Packets contain overhead information including addressing
 - ☐ They are also routed, like mail
 - ☐ All of this flows across Internet backbones

Public policy, Legal privacy issues:

- Public policy is one of two supporting pillars for e-commerce. Public policy issues include:
 - ☐ universal access,
 - ☐ privacy,
 - ☐ information pricing,
 - ☐ information access.
- Privacy issues include what information is private and/or who should have the right to use/sell information about Internet users:
 - ☐ Requesting personal information on visiting a web site
 - ☐ Creating customer profiles
 - ☐ Leaving electronic footprints when visiting a website

Technical Standards:

- Standardization is the second supporting pillar for e-Commerce. Standards are critical for electronic interaction.
 - *Secure Electronic Transaction (SET)* for secure payments of online credit card transactions is one of the most heavily promoted standards
 - Other application standards include file transfer protocol (FTP), hypertext transfer protocol (HTTP), simple network management protocol (SNMP), post office protocol (POP), and multimedia internet mail extensions (MIME)
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Difference between Traditional Commerce and E-commerce

1. Traditional Commerce :

Traditional commerce refers to the commercial transactions or exchange of information, buying or selling product/services from person to person without use of internet which is a older method of business style and comes under traditional business. Now a days people are not preferring this as it is time taking and needs physical way of doing business.

Example: physical market/bazaar.

2. E-commerce :

E-commerce refers to the commercial transactions or exchange of information, buying or selling product/services electronically with the help of internet which is a newer concept of business style and comes under e-business. Now a days people are preferring this as it is less time taking and does not need physical way of doing business everything can be done with laptop or smartphone and internet.

Example: online shopping sites.

Difference between Traditional Commerce and E-commerce :

S.No	TRADITIONAL COMMERCE	E-COMMERCE
1	Traditional commerce refers to the commercial transactions or exchange of information, buying or selling product/services from person to person without use of internet.	E-commerce refers to the commercial transactions or exchange of information, buying or selling product/services electronically with the help of internet.
2	In traditional commerce it is difficult to establish and maintain standard practices	In e-commerce it is easy to establish and maintain standard practices.
3	In traditional commerce direct interaction through seller and buyer is present.	In e-commerce indirect interaction through seller and buyer occurs using electronic medium and internet.
4	Traditional commerce is carried out by face to face, telephone lines or mail systems.	E-commerce is carried out by internet or other network communication technology.
5	In traditional commerce processing of transaction is manual.	In e-commerce processing of transaction is automatic.
6	In traditional commerce delivery of goods is instant.	In e-commerce delivery of goods takes time.
7	Its accessibility is for limited time in a day.	Its accessibility is 24×7×365 means round the clock.
8	Traditional commerce is done where digital network is not reachable.	E-commerce is used to save valuable time and money.
9	Traditional commerce is a older method of business style which comes under traditional business.	E-commerce is a newer concept of business style which comes under e-business.

10	Its resource focuses on supply side.	Its resource focuses on demand side.
11	In traditional commerce customers can inspect products physically before purchase.	In e-commerce customers can not inspect products physically before purchase.
12	Its business scope of business is a limited physical area.	Its business scope is worldwide as it is done through digital medium.
13	For customer support, information exchange there is no such uniform platform.	For customer support, information exchange there is exists uniform platform.

ANATOMY OF E-COMMERCE APPLICATIONS:

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

Multimedia Content for E-Commerce Applications:

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

Multimedia Storage Servers & E-Commerce Applications:

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

i. Client-Server Architecture in Electronic Commerce:

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

ii. Internal Processes of Multimedia Servers:

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

- Include high-end symmetric multiprocessors, clustered architecture, and massive parallel systems.

iii. Video Servers & E-Commerce:

The electronic commerce applications related to digital video will include

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

- Consumer applications will include video-on-demand.

•The figure which is of video—on demand consist video servers, is an link between the content providers (media) & transport providers (cable operators)

Information Delivery/Transport & E-Commerce Applications

- Transport providers are principally telecommunications, cable, & wireless industries.

Sno.	Information Transport Providers	Information Delivery Methods
1	Telecommunication companies	long-distance telephone lines; local telephone lines
2	Cable television companies	Cable TV coaxial, fiber optic & satellite lines
3	Computer-based on-line servers	Internet; commercial on-line service providers
4	Wireless communications	Cellular & radio networks; paging systems

Consumer Access Devices

Sno.	Information Consumers	Access Devices
1	Computers with audio & video capabilities	Personal/desktop computing, Mobile computing
2	Telephonic devices	Videophone
3	Consumer electronics	Television + set-top box Game systems

4	Personal digital assistants (PDAs)	Pen-based computing, voice- driven computing
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NETWORK INFRASTRUCTURE FOR E-COMMERCE:

E-business infrastructure is the architecture of hardware, software, content and data used to deliver e-business services to employees, customers and partners.

Defining an adequate E-business infrastructure is vital to all companies adopting e-business as it affects directly the quality of service experienced by users of the system in terms of speed and responsiveness.

E-Business needs a network infrastructure to transport the content through electronic, interactive or multimedia superhighway. Information superhighways(I-way) describe a high capacity (broadband), interactive (two way) electronic pipeline to home or office that capable of supporting a large numbers of e-com applications.

E-business user requires voice, data and video conferencing services with their respective separate networks.

There are 3 major components which build the information superhighway or E-business infrastructure.

- Consumer access equipment.
- Local on - ramps.
- Global Information distribution network.

1. CONSUMER ACCESS EQUIPMENT

- It represents a critical category, the absence or slow progress of which is holding up other segments of the I-way.
- It includes hardware and software vendors such as:
 - ☐ Physical devices: Routers and switches and hubs.
 - ☐ Access devices such as computers and set-top boxes
 - ☐ Software platforms such as browsers and operating systems like Mozilla Firefox, Internet explorer, AOL Explorer etc.

2. LOCAL OR ACCESS ROADS, OR ON-RAMPS

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

3. GLOBAL INFORMATION DISTRIBUTION NETWORKS

- It represents the infrastructure crisscrossing countries and continents.
- Most of the infrastructure for the I-way already exists in the vast network of fiber optic strands, coaxial cables, radio waves, satellites, and copper wires spanning the globe.

- Linking all the components of the I-way will require large capital investments in "open" systems (interoperable equipment that uses common standards) and installing gateways between various networks.
- A final requirement is switching hardware and software to move huge amounts of data effortlessly over such a complex network.

GLOBAL INFORMATION DISTRIBUTION NETWORKS:

Global information distribution networks are the infrastructure that are connecting countries and continents. Extranets, Intranets and the Internet, the above parties are spread over diverse locations, extranets use the internet as a network to reach out to these parties. A company typically has multiple dedicated extranets for different parties depending on information needs and nature of relationship. Extranets can sometimes also be seen as an extension of the company "intranet" or internal network where external parties are brought into the fold of the company's private network with access to specific areas or information.

Internet

This is the world-wide network of computers accessible to anyone who knows their Internet Protocol (IP) address – the IP address is a unique set of numbers (such as 209.33.27.100) that defines the computer's location.

Intranet

This is a network that is not available to the world outside of the Intranet. If the Intranet network is connected to the Internet, the Intranet will reside behind a firewall and, if it allows access from the Internet, will be an Extranet. The firewall helps to control access between the Intranet and Internet to permit access to the Intranet only to people who are members of the same company or organisation.

Extranet

An Extranet is actually an Intranet that is partially accessible to authorised outsiders. The actual server (the computer that serves up the web pages) will reside behind a firewall. The firewall helps to control access between the Intranet and Internet permitting access to the Intranet only to people who are suitably authorized.

The two major technologies used in high-speed global information distribution networks are fiber optic long-distance networks and satellites.

Long-Distance Networks:

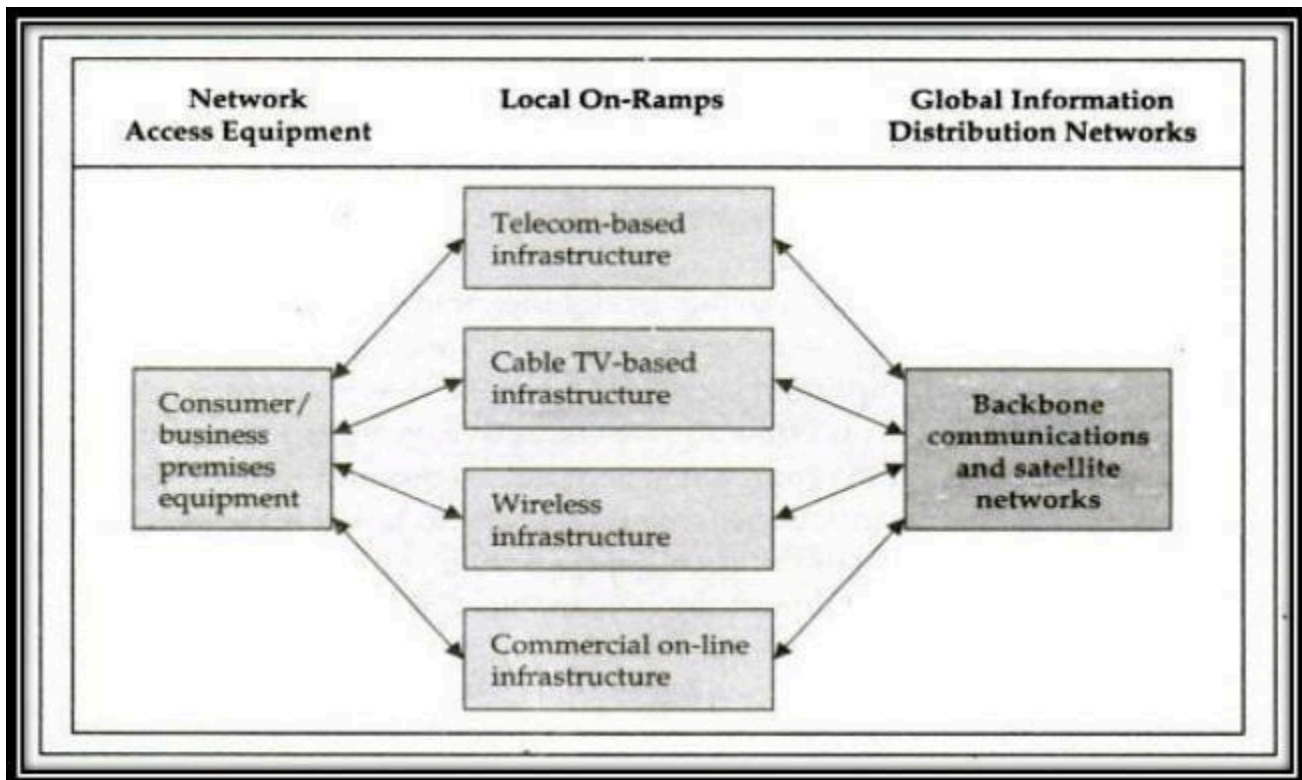
Long-distance connectivity is available via cable (coaxial or fiber) owned by long-distance or interexchange carriers (IXCs). The current large-scale capacity of fiber optic connections between the US and Europe is being operated at gigabit rates. US long distance services are provided by AT&T, MCI, Sprint, WorldCom.

Satellite Networks

Initially, satellites were used to transport long-distance telecommunications and one-way video broadcasts. The advent of fiber optics in the 1980s, changed the role of satellites in the global communications industry. Satellite networks do have some advantages over terrestrial networks. They are accessible from

any spot on the globe; can provide broadband digital services, including voice, data and video to many points. In the 1980s, industry introduced a new class of satellite using a narrow beam to focus the transmitted energy on a small geographic area known as very small aperture terminal (VSAT) satellite. VSAT networks are being used by large corporations to link hundreds of retail sites.

COMPONENTS OF THE I-WAY



Consumer access equipment: These are gadgets appropriated to utilize the sound and media intuitive substance of e-commerce. In this section, software and hardware sellers are likewise included.

Local or access road: This fragment of I-way rearranges linkages between organizations, institutes, and homes to the correspondences point. There are four distinct sorts of supplier of this segment as follows:

- Cable TV-based
- Telecom-based
- Computer-based
- Wireless-based and

Global information distribution networks: It addresses to the frameworks that are connected to several nations. A large portion of the foundation for the I-way as of now exists in the limitless system of fiber optic, coaxial links, radio waves, satellites, and copper wires.

Access Equipment:

It addresses a basic class, the nonattendance or moderate advancement of which is holding up different portions of the I-way. For example, "interactive television" is unusual, not due to an absence of wiring, but rather as a result of an absence of reasonable hardware on the client's side for access and on the supplier's side for dispersion. This portion of the I-way incorporates equipment and programming sellers, who give physical gadgets, for example, switches and routers, access gadgets, for example, PCs, set-top boxes, programs and working frameworks

Global Information Distribution Network:

It is the foundation that are joining several nations. "Extranets" utilize the web as a system to connect with these groups.

Intranet:

It is a framework that is not available to the outside world of the "Intranet." If this framework is connected to the "Internet", then it will live behind a "firewall." This firewall controls access to the Intranet and Internet permits to get to the Intranet to those people who are people from the same association or affiliation.

Extranet:

It is likewise a kind of an intranet that is accessible to endorsed outcasts. The certified server will live behind a firewall. The firewall controls access to the "Intranet and Internet is permitting access to the Intranet to those people who are completely endorsed by the organization.

Broadband Telecommunication:

It is any transmission that makes utilization of a computerized or simple sign to hand-off voice and information. Broadband telecommunications have two types which are used in house to access the internet.

First one is the "DSL (Digital Subscriber Line)." It provide fast Internet and telephone services within the same line.

The second solution is the "cable network." It also provides the Internet service and access to satellite TV.

PUBLIC POLICY ISSUES SHAPING THE I-WAY:

Public policy issues shaping the I-way.

1. Cost:

Who should pay for constructing the I-way? Some favor the interstate highway model with government construction, ownership, and maintenance. Others support the current regulated phone system model.

2. Subsidies:

Developers might hope for subsidies, tax breaks, government business, or other forms of encouragement. What will these tax subsidies subsidize? This remains unresolved.

3. Access to Local Infrastructure:

Local infrastructure within a country is a matter of local policy and investment and is the area of greatest unevenness across countries. The disparity between developed and developing data communications environments is a source of operational frustration to businesses and also effects international connections. In some countries, state-owned telecoms control both domestic and international communications. There, it is extremely difficult to acquire a direct link into a specific site, and often use of an expensive Telco-operated network is mandated.

4. Regulation:

Some free enterprises argue that if a highway is built with private funds then there is no government regulation. Some argue the open competition among highway operators, but regulation to provide public access, privacy, and reasonable tolls. What are the rules? Who writes them? Who enforces them? These issues remain undecided.

5. Universal Access:

Equal access probably means that cable and phone companies deploying upgraded networks going to be required to serve some consumers at prices below cost, and to outspread wires to places where other technologies (like satellite) would make more sense. Some insist that highway operators must provide universal access at a reasonable cost. If the I-way is built and run by private interests without significant government investment, the non-profit organizations might not be able to afford to hook up to the network. Whether universal access is nationwide or international it is still ambiguous.

6. Social and religious barriers:

Cyberspace is considered to be a representation of free speech and democracy. For many strongly religious, countries where free speech is alien, the Internet presents interesting problems and policy issues. For other countries, where women have been denied a voice and access to media for many years, the Internet causes many headaches (the Internet doesn't distinguish between sexes.)

NETWORK ACCESS EQUIPMENT:

Network Access Equipment CPE (Customer Premises Equipment) or terminal equipment is a generic term for privately owned communications equipment that is attached to the network. This can be divided into three parts: Cable TV set-top boxes; computer based telephony; and hubs, wiring closets, and routers or digital switches.

Set-Top Boxes:

A key hardware platform for I-way access will be cable converter boxes, also known as set-top boxes, converter boxes, and converters/descramblers. These boxes will have greater intelligence and more features than the existing converter boxes, such as enabling users to make phone calls, surf the internet, and even plan their viewing schedule for the week.

Computer-Based Telephony:

The largest CPE product sectors are private branch exchanges(PBXs), telephones, facsimile products, modems, voice processing equipment and video communication equipment.

Digital switches, Routers and Hubs

The digital switching industry has a major impact on the I-way. All digital bits and data pass through switches that route them to their intended destination- either one or multiple recipients. Since the bundles of data known as packets and the packets move through a network at very high speeds, this routing technique is known as fast packet switching.

ROUTER:

Routers are internetworking devices that intelligently connect the local area networks(LANs) and backbone wide area networks(WANs) or various providers.

HUBS:

Hubs act as the wiring centres for large LANs- they can diagnose line failures, measure and manage traffic flow, and greatly simplify reconfiguring large LANs.