

UNIT-V: E-Commerce: Electronic commerce environment and opportunities: back ground, electronic commerce Environment, Modes of electronic commerce: Approaches to safe electronic commerce, Overview, Secure transport protocols, Secure Transactions, Secure Electronic Payment Protocol, and Secure Electronic Transaction.

- ❖ **E-Commerce: Electronic commerce**, commonly known as **E-commerce** is trading in products or services using computer networks, such as the Internet.
- Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems.
- Modern electronic commerce typically uses the World Wide Web for at least one part of the transaction's life cycle, although it may also use other technologies such as e-mail.
- In E-enterprise, business is conducted electronically. Buyers and sellers through Internet drive the market and Internet based web systems. Buying and selling is possible on Internet. Books, CDs, computer, white goods and many such goods are bought and sold on Internet. The new channel of business is well known as E-commerce.
- **Definition of E-commerce:** Sharing business information, maintaining business relationships and conducting business transactions using computers connected to telecommunication network is called E-Commerce.
- **Advantages/ Benefits of E-commerce:**
 - Buying/selling a variety of goods and services from one's home or business
 - Anywhere, anytime transaction
 - Can look for lowest cost for specific goods or service
 - Businesses can reach out to worldwide clients - can establish business partnerships
 - Order processing cost reduced
 - Electronic funds transfer faster
 - Supply chain management is simpler, faster, and cheaper using ecommerce
 - Can order from several vendors and monitor supplies.
 - Production schedule and inventory of an organization can be inspected by cooperating supplier who can in-turn schedule their work
- **Disadvantages Of E-commerce:**
 - Electronic data interchange using EDI is expensive for small businesses
 - Security of internet is not very good - viruses, hacker attacks can paralise e-commerce
 - Privacy of e-transactions is not guaranteed
 - E-commerce de-personalises shopping
- ❖ **E commerce - back ground:**
 - “The Internet will change the way you do Business you can’t ignore it!” are now common.
 - In the past few years access to the internet has been increasing * percent per month in the United states and Canada.

- Nearly 80,000 companies and 6 million consumers worldwide used to the internet at the end of 2010. This number is expected to jump to millions of companies and consumers by the year 2025.
- The internet's economics and interactivity are changing the rules and leveling the playing field: now, even the smallest companies can compete strategically with major corporations.
- Over the centuries, even the millennia business successfully sought to utilize advances in technology to introduce and promote their products.
- During the past century the telegraph, the telephone, fax and electronic mail have provided faster, cheaper and more reliable ways of communicating business information within and between commercial entities.
- Now, what has become critical is access to a worldwide, integrated service (data, voice, and video) communication network. This network needs to support both the global nature of the worldwide corporation, as well as the soon to be common electronic commerce.

❖ **E commerce - Environment:**

➤ **The Virtual Corporation:**

- In Electronic commerce goes hand in hand with changes that are occurring in corporation. The 1990's have seen the rise of a new form of industrial organization. The network firm, sometimes known as the virtual organization.
- Information technology (IT) has also undergone a significant change in the past quarter of a century.
- Electronic commerce is the essence of the virtual corporation: It allows the organization to leverage information and communication resource with all its constituencies, including employees, customers, bankers, government agencies, suppliers, advertisement agencies, and the public.

➤ **The Electronic Marketers:**

- Electronic marketers are defined as companies that market their products and service to other business or consumers through private on-line networks, commercial on-line services such as Prodigy and America Online (AOL); The internet, CD-ROM, telecommunication-enhanced CD-ROM, interactive television and webTV, and floppy disk media.
- Electronic commerce frees retailers and consumers from many store constraints. It changes the dynamic in terms of cost, reach, options or speed.

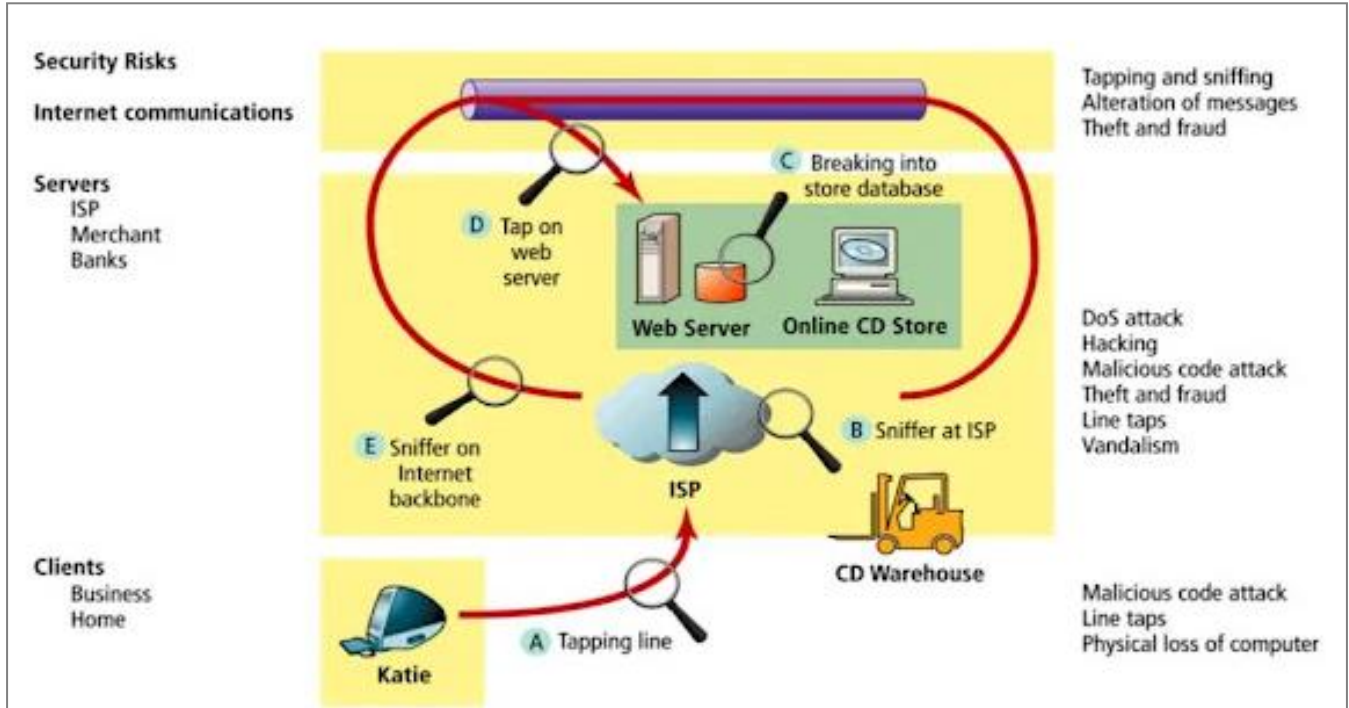
➤ **The Catalyst of Electronic and Web Commerce:**

- The growth of the internet in terms of people accessing it is now being viewed as one of the greatest transformations in society in the past 25 years. Even the growth and impact of the PC was not as strong in the view of some observers.
- The internet is an aggregation of network connecting computers which is seen as one network by the user. It is the case where the whole is greater than the sum of the parts.
- Press-time studies indicate that 90 percent of the people using web service do so to browse or explore. About 13 percent purchase product or service.

➤ **Available Communication Apparatus:**

- The Electronic commerce clearly depends on the availability of reliable, inexpensive, and ubiquitous connectivity.

- In this context there are five relevant elements:
 1. Organizations own enterprise network which house appropriate information, usually beyond the organizations firewall apparatuses.
 2. Public switched telephone network.
 3. the internet.
 4. On-line networks such as America online, which utilize their own communication and information (storage) facilities.
 5. Specialized industry networks, such as those to support EDI.

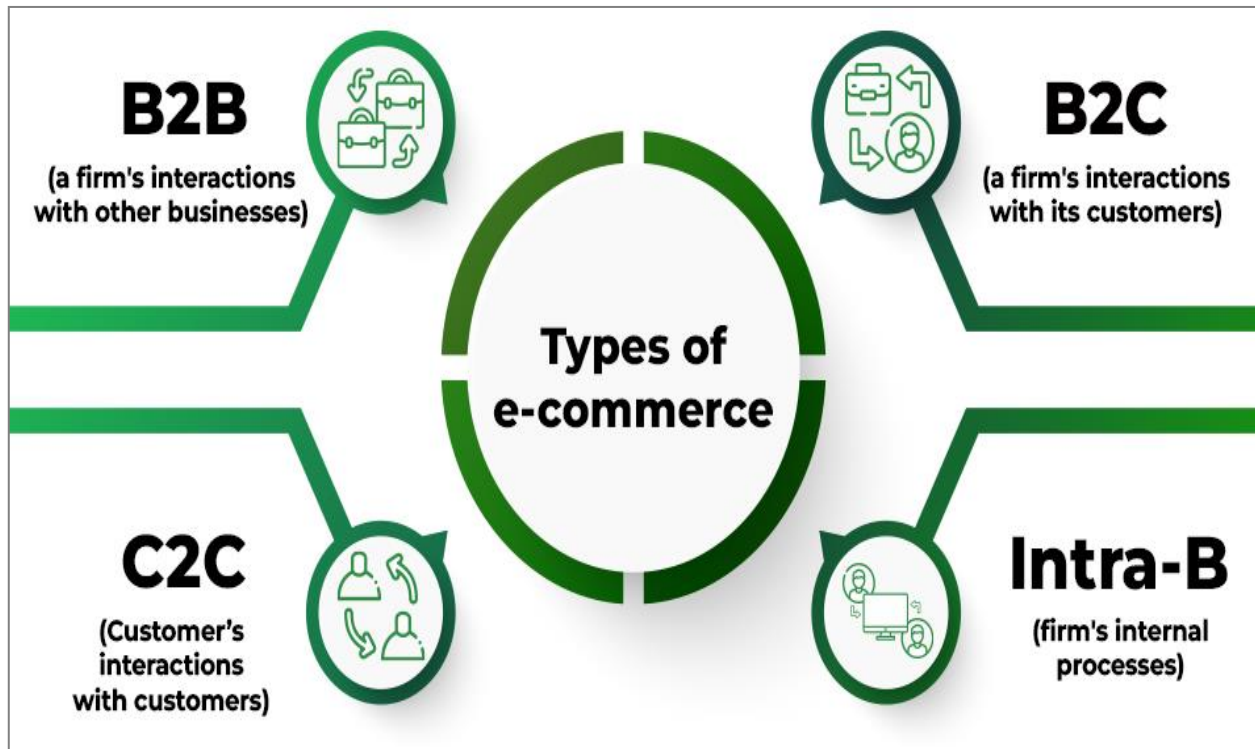


➤ **APPLICATION OF ELECTRONIC /WEB COMMERCE :**

- The Electronic commerce combines the advantages of computer-based processing (speed, reliability, and relatively high volumes of data) with the advantages of people based insight (creativity, flexibility, adaptability).
- Electronic commerce enables peoples to review, analyze, add value, and sell a variety of products. that are represented electronically, such as reference material, textbooks and training materials, entertainment and software.

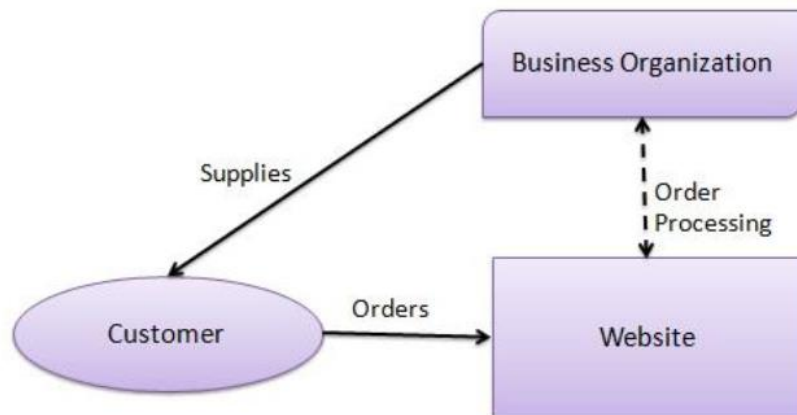
❖ **Modes/ Types/ Models of E commerce:**

- There are mainly 4 types of business models based on transaction party:
 - 1) Business-to-Consumer (B2C)
 - 2) Business-to-Business (B2B)
 - 3) Consumer-to-Business (C2B)
 - 4) Consumer-to-Consumer (C2C)



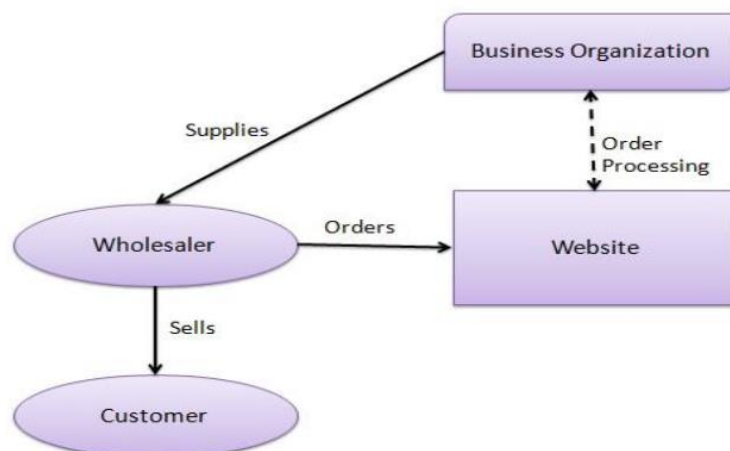
➤ **Business-to-Consumer (B2C):**

➤ In a Business-to-Consumer E-commerce environment, companies sell their online goods to consumers who are the end users of their products or services. Usually, B2C E-commerce web shops have an open access for any visitor, meaning that there is no need for a person to login in order to make any product related inquiry.



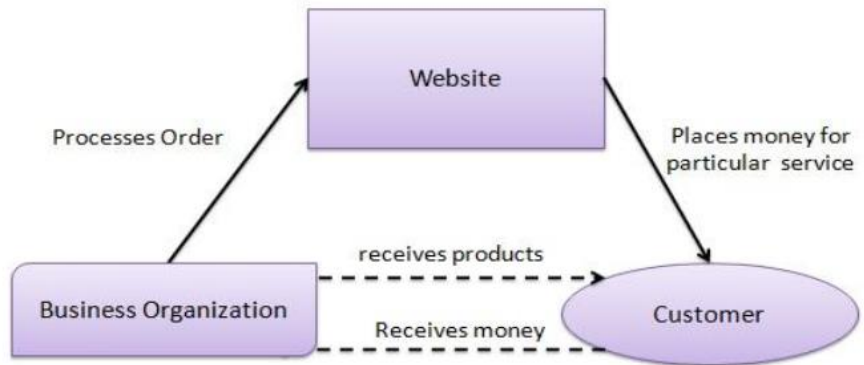
➤ **Business-to-Business (B2B):**

➤ In a Business-to-Business E-commerce environment, companies sell their online goods to other companies without being engaged in sales to consumers. In most B2B E-commerce environments entering the web shop will require a log in. B2B web shop usually contains customer-specific pricing, customer-specific assortments and customer-specific discounts.



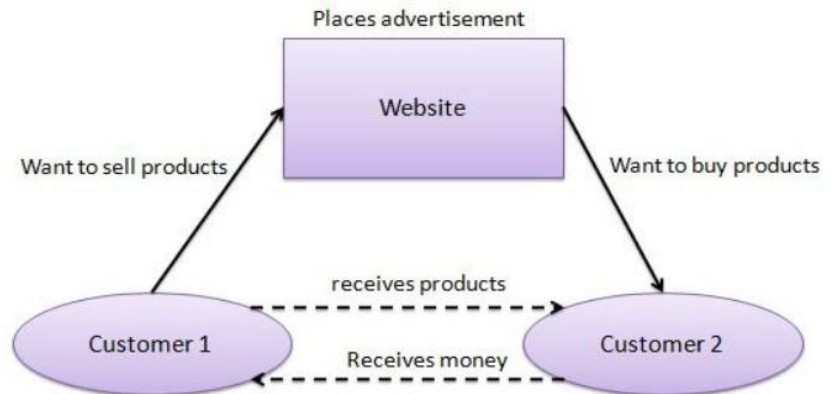
➤ **Consumer-to-Business (C2B) :**

➤ In a Consumer-to-Business E-commerce environment, consumers usually post their products or services online on which companies can post their bids. A consumer reviews the bids and selects the company that meets his price expectations.



➤ **Consumer-to-Consumer (C2C):**

➤ In a Consumer-to-Consumer E-commerce environment consumers sell their online goods to other consumers. A well-known example is eBay.



❖ **Approaches to safe e-commerce/ secured e-commerce:**

➤ **Overview:**

➤ E-Commerce security requirements can be studied by examining the overall process, beginning with the consumer and ending with the commerce server. Considering each logical link in the commerce chain, the assets that must be protected to ensure secure e-commerce include client computers, the messages travelling on the communication channel, and the web and commerce servers – including any hardware attached to the servers.

➤ If the telecommunications links were made secure but no security measures were implemented for either client computers or commerce and web-servers, then no communications security would exist at all.

➤ **(Security) Threats for e-commerce:**

➤ **Client threats:** Until the introduction of executable web content, Web pages were mainly static. Coded in HTML, static pages could do little more than display content and provide links to related pages with additional information.

➤ **Active content:** Active content refers to programs that are embedded transparently in web pages and that cause action to occur. Active content can display moving graphics, download and play audio, or implement web-based spreadsheet programs. Active content is used in e-commerce to place items one wishes to purchase into a shopping cart and to compute the total invoice amount.

➤ **Malicious codes:** Computer viruses, worms and trojan horses are examples of malicious

code. A trojan horse is a program which performs a useful function, but performs an unexpected action as well. Virus is a code segment which replicates by attaching copies to existing executables.

- **Server-side masquerading:** Masquerading lures a victim into believing that the entity with which it is communicating is a different entity. For example, if a user tries to log into a computer across the internet but instead reaches another computer that claims to be the desired one, the user has been spoofed.
- **Communication channel threats** The internet serves as the electronic chain linking a consumer (client) to an e-commerce resource. Messages on the internet travel a random path from a source node to a destination node. The message passes through a number of intermediate computers on the network before reaching the final destination. It is impossible to guarantee that every computer on the internet through which messages pass is safe, secure, and non-hostile.
- **Confidentiality threats:** Confidentiality is the prevention of unauthorized information disclosure. Breaching confidentiality on the internet is not difficult. Suppose one logs onto a website – say www.anybiz.com – that contains a form with text boxes for name, address, and e-mail address.

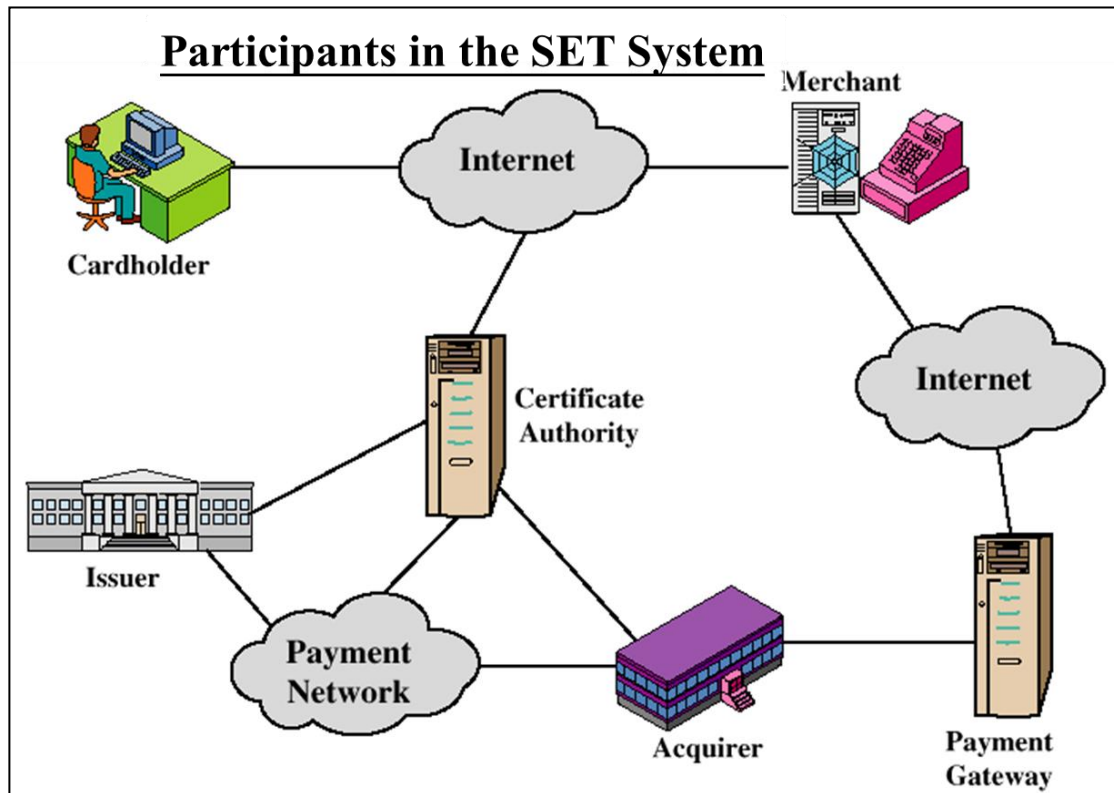
The captured data and the HTTP request to send the data to the server is then sent. Now, suppose the user changes his mind, decides not to wait for a response from the anybiz.com server, and jumps to another website instead – say www.somecompany.com. The server somecompany.com may choose to collect web demographics and log the URL from which the user just came (www.anybiz.com). By doing this, somecompany.com has breached confidentiality by recording the secret information the user has just entered.

- **Integrity threats:** An integrity threat exists when an unauthorized party can alter a message stream of information. Unprotected banking transactions are subject to integrity violations. Cyber vandalism is an example of an integrity violation.
- **Commerce server threats:** The commerce server, along with the web-server, responds to requests from web browsers through the HTTP protocol and CGI (common gateway interface) scripts.
- **Database threats:** E-commerce systems store user data and retrieve product information from databases connected to the web-server. Besides product information, databases connected to the web contain valuable and private information that could irreparably damage a company if it were disclosed or altered.
- **Password hacking:** The simplest attack against a password-based system is to guess passwords. Guessing of passwords requires that access to the complement, the complementation functions, and the authentication functions be obtained. If none of these have changed by the time the password is guessed, then the attacker can use the password to access the system.

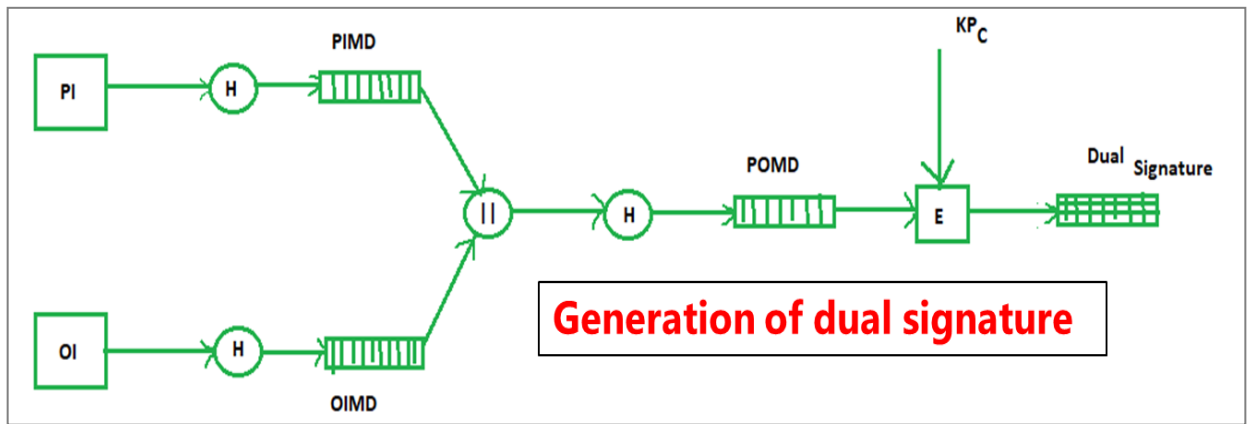
❖ **Secure E-commerce Transport/Transaction (SET):**

- **Definition: Secure E-commerce Transport/Transaction (SET):** The Secure Electronic Transaction (SET) is a **protocol** designed for protecting credit card transactions over the Internet.
- It is an industry-backed standard that was formed by MasterCard and Visa (acting as the governing body) in **February 1996**. To promote the SET standard throughout the payments community, advice and assistance for its development have been provided by IBM, GTE, Microsoft, Netscape, RSA, SAIC, Terisa, and Verisign.

- Secure electronic transaction protocols allowed merchants to verify their customers' card information without actually seeing it, thus protecting the customer against account theft, hacking, and other criminal actions.
- Today's technologies have the potential to revolutionize e-commerce. One possible approach is to combine the safe environment of the Trusted Execution Environment (TEE) with the advanced flexible nature of cyber currencies. Online merchants would then be able to offer consumers an alternate secure environment in which to undertake transactions.



- **Secure E-commerce Transport/Transaction (SET) protocols:**
- **Requirements in SET:**
 - It has to **provide mutual authentication** i.e., customer (or cardholder) authentication
 - It has to **keep the PI (Payment Information) and OI (Order Information)** confidential by appropriate encryptions.
 - It has to be resistive against message modifications.
 - SET also needs to provide interoperability and make use of the best security mechanisms.
- **Dual Signature:** The dual signature is a concept introduced with SET, which aims at connecting two information pieces meant for two different receivers :
 - # **Order Information (OI) for merchant**
 - # **Payment Information (PI) for bank**

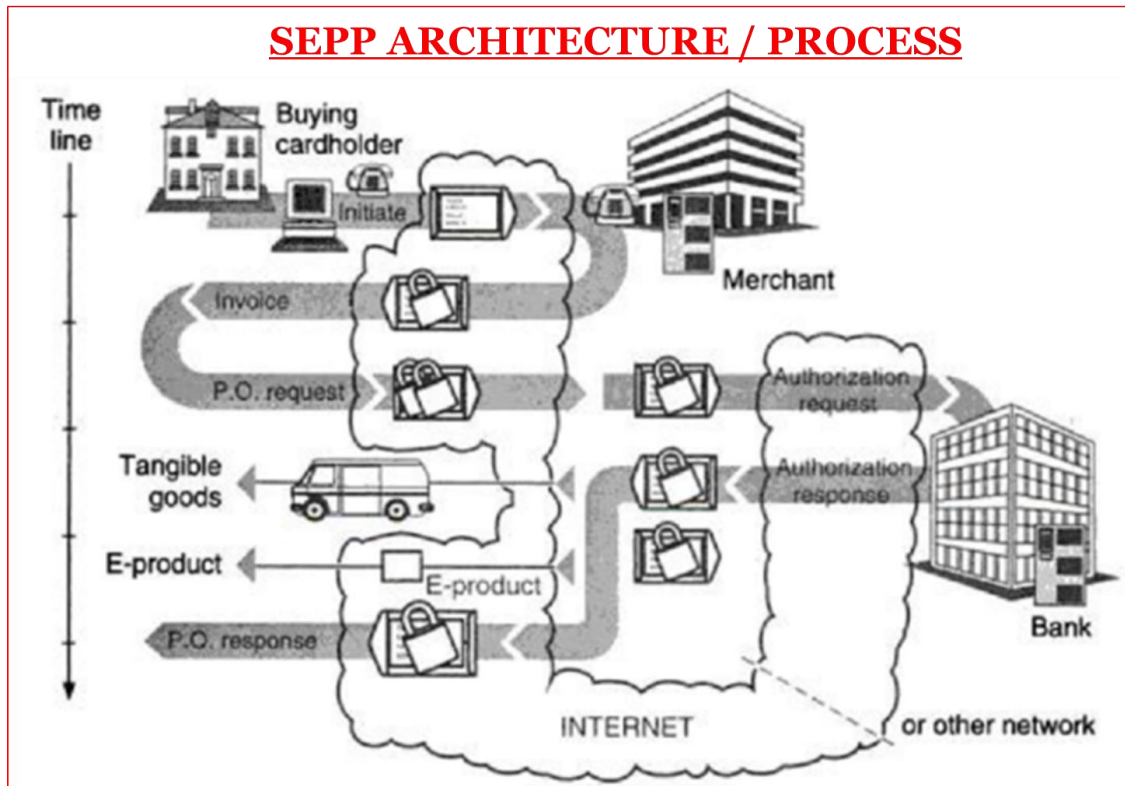


- # PI stands for payment information
- # OI stands for order information
- # PIMD stands for Payment Information Message Digest
- # OIMD stands for Order Information Message Digest
- # POMD stands for Payment Order Message Digest
- # H stands for Hashing
- # E stands for public key encryption
- # KPC is customer's private key
- # || stands for append operation Dual signature,
- # DS= E(KPC, [H(H(PI)||H(OI))])

❖ **Secure Electronic Payment Protocol (SEPP):**

- SEPP is an open, vendor-neutral, license free specification that secures on-line transactions.
- It provides a standard for presenting credit card transactions on the Internet.
- IBM, Netscape, MasterCard, etc., are some of the companies that have developed SEPP at the beginning.
- SEPP helps in fulfilling some of the **business requirements** as follows:
 - It enables **confidentially** of payment information.
 - It ensures **integrity** of all the payment data that is transmitted.
 - It provides **the authentication that the card holder is the legitimated owner of the card account.**
 - It provides **the authentication that the merchant can receive MasterCard branded card payments** along with an acquiring member financial institution.
- **SEPP process:**
 - # SEPP assumes that the cardholder and merchant have been communicating in order to negotiate terms of a purchase and generate an order.
 - # These processes may be conducted via a WWW browser;
 - # These operations may be performed through the use of email via the user's review of a paper or CD-ROM catalogue or other mechanisms.

SEPP is designed to support transaction activity exchanged in both interactive (on-line) and non interactive (off-line) modes.



➤ The SEPP system is **composed** of a **collection of elements** involved in E- commerce:

Card holder: This is an authorized holder of a bankcard supported by an issuer and registered to perform electronic commerce

Merchant: This is merchant of goods, services, and/or e-products who accepts payment for them electronically and may provide selling services and/or electronic delivery of items for sale(e.g. e-products)

Acquirer: This is a (MasterCard member) financial institution that supports merchants by providing service for processing credit-card based transactions.

Certificate management system: This is an agent of one or more bankcard association that provides for the creation and distribution of electronic certificates for merchants, acquirers and cardholders.

Bank net: This represents the existing network which interfaces acquirers, issuers, and the certificate management systems.

➤ **Messages for SEPP-compliant processing of payment transactions:**

- Purchase order request
- Authorization request
- Authorization response
- Purchase Order Inquiry
- Purchase order Inquiry Response

➤ **Additional messages for online customer:**

- Initiate
- Invoice

- Purchase order response(with Purchase order status)
- Messages for offline (i.e. e-mail) transactions or transaction sent to merchant not on-line with the acquirer
- Purchase order response (acknowledgement without authorization)

OOOOO # *** # OOOOO

MIS Questions_ UNIT5:

1. What is E-Commerce? Give an account of opportunities on E-Commerce? (CO5)
2. Explain the features of E-commerce? (CO5)
3. What are the environmental factors of e-commerce? (CO5)
4. Explain various Modes of electronic commerce with examples. (CO5)
5. What is e-commerce security? Explain the approaches for safety of e-commerce transaction? (CO5)
6. Explain the need of Secure Electronic Transaction (SET) in e-commerce? (CO5)
7. What are the types of security protocols in e-commerce? (CO5)
8. Explain the design of Secure Electronic Payment Protocol (SEPP). (CO5)
9. What are the benefits of E-commerce? (CO5)

*****_