WEIGHTAGE TO OBJECTIVES TABLE

SL.NO	OBJECTIVES	MARKS	% MARKS
1.	Knowledge (Remembering)	05	10
2.	Understanding	20	40
3.	Application	15	30
4.	Skill	10	20
Total		50	100

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EXAM: IV SEM **PAPER:** 20BCASD43
SUBJECT: E- Commerce **CLASS:** BCA
MAXIMUM: 50 **TIME:** 2 Hrs

Unit	REMEMBERING			UNDERSTAND			APPLICATION			SKILL			Total
	OT	SA	Unit wise Marks	OT	SA	Unit wise Marks	OT	SA	Unit wise Marks	OT	S A	Unit wise Marks	
1	1(1)	1(4)	5	1(1)		1		1(4)	4				10
2				1(1)	2(4)	9				1(1)		1	10
3				1(1)	1(4)	5	1(1)	1(4)	5				10
4							2(1)		2		2(4)	8	10
5				1(1)	1(4)	5		1(4)	4	1(1)		1	10
	05			20				15		10			50

BLUE PRINT

EXAM: IV SEM **PAPER:** 20BCASD43
SUBJECT: E- Commerce **CLASS:** BCA

Unit	REMEMBERING		UNDERSTAND		APPLICATION		SKILL		Total
	OT	SA	OT	SA	OT	SA	OT	S A	
1	1(1)	1(4)	1(1)			1(4)			10
2			1(1)	2(4)			1(1)		10

3			1(1)	1(4)	1(1)	1(4)			10
4					2(1)			2(4)	10
5			1(1)	1(4)		1(4)	1(1)		10
	05		20		15		10		50

MAXIMUM: **50** **TIME:** **2Hrs**

UNIT I

MULTIPLE CHOICE QUESTIONS

Questions for Remembering

a. Can you name which phase of E-commerce system has replacement of parts or item?
   A. Information Exchange
   B. Contract and Order
   C. Shipment and Payment
   D. Customer Service

b. Can you name which perspective says that EC is the application of technology toward the automation of business transactions and work flow.
   A. Communications Perspective
   B. Business Process Perspective
   C. Service Perspective
   D. Online Perspective

c. What is the full form of B2B?
   A. Business to Business
   B. Bank to Bank
   C. Bank to business
   D. Business to Bank

d. Can you name Which E-commerce supports Inter-organizational interaction.
   A. Business-to-Business (B2B)
   B. Business-to-Consumer (B2C)
   C. Consumer-to-Business (C2B)
   D. Consumer-to-Consumer (C2C)

e. Can you name which e-commerce is also called demand collection model?
   A. Business-to-Business (B2B)
   B. Business-to-Consumer (B2C)
   C. Consumer-to-Business (C2B)
   D. Consumer-to-Consumer (C2C)

f. Can you name Which E-commerce supports Intra-organizational interaction.
   A. Business-to-Business (B2B)
   B. Business-to-Consumer (B2C)
   C. Consumer-to-Business (C2B)
   D. Business-to-Employee (B2E)

g. What is the Full form of VAN?
   A. Value added Network
   B. Value area Network
   C. Validation added network
   D. Validation area network

h. Define Electronic Commerce.
   A. Commerce of electronic good
   B. Commerce which depends on electronics
   C. Commerce which is based on the use of internet

D. **Commerce which is based on transactions using computers connected by telecommunication network**

i. What is the Full form of EDI?
   A. Electronic Data Interchange
   B. Electronic Digital Interchange
   C. Electronic Data Issue
   D. Electronic Digital Issue

j. Can you name, EDI is most commonly used in which type of E commerce.
   A. B2B
   B. B2C
   C. C2C
   D. C2B

k. What is the Full form of EFT?
   A. Electronic Fund Transfer
   B. Electronic Faster Transfer
   C. Electronic Fund Technology
   D. Electronic Fast Technology

l. Can you name under which E-commerce Stock Market comes.
   A. B2B
   B. B2C
   C. C2C
   D. C2B

m. Can you name which among the following is not part of B2B architectural model.
   A. Supplier Oriented marketplace
   B. Buyer Oriented marketplace
   C. Intermediary Oriented marketplace
   D. Time Oriented marketplace

Questions for Understanding

n. Can you clarify, Banner advertisements are included in _____ phase of E-commerce system.
   A. **Information Exchange**
   B. Contract and Order
   C. Shipment and Payment
   D. Customer Service

o. Can you clarify this, EC is the delivery of information, products /services, or payments over the telephone lines, computer networks or any other electronic means, which of the following perspective define this?
   A. **Communications Perspective**
   B. Business Process Perspective
   C. Service Perspective
   D. Online Perspective

p. What do you think, E-bay is an example of which type of E-commerce.

A. Online Auctions
B. Internet Banking
C. Online Ticketing
D. Electronic Payments

q. What do you think, after choosing to visit the web store, the consumer is typically connected to_____.
A. Online transaction server
B. Private Gateway
C. Processing network
D. Merchants Bank

r. Can you clarify, in which process of e-Commerce, the labelling of product is done.
A. Places an order
B. Order details are entered into your business software
C. Order is passed to the warehouse to be processed
D. Processing order for Shipping

s. Can you clarify, which type of E-Commerce focus on consumer dealing with each other.
A. Business-to-Business (B2B)
B. Business-to-Consumer (B2C)
C. Consumer-to-Consumer (C2C)
D. Business-to-Employee (B2E)

t. Can you clarify, Stock availability, item location criteria are mentioned in _____ list.
A. Pick List
B. Sample List
C. Product List
D. Payment List

u. What do you think, which of the following basic system functionalities is used to display goods on a Web site?
A. Shopping cart system
B. Digital Catalog
C. Customer based database system
D. Product database

v. Can you clarify, which type of E-Commerce deals with auction?
A. B2B
B. C2B
C. B2C
D. C2C

w. What do you think, Amazon is a best example of _____ site.
A. Blogging
B. Social Networking
C. E-commerce
D. Entertainment

x. What do you think, which of the following is not an example of e-Commerce site?
   A. Amazon
   B. Flipkart
   C. E-bay
   D. Twitter

y. What do you think, most individuals are familiar with which form of E-commerce.
   A. B2B
   B. B2C
   C. C2B
   D. C2C

Long Answers

Questions for Remembering

1. What are the different perspectives of E-Commerce?

Electronic Commerce (EC) is defined under each perspective.

1. Communications Perspective: EC is the delivery of information, products /services, or payments over the telephone lines, computer networks or any other electronic means.
2. Business Process Perspective: EC is the application of technology toward the automation of business transactions and work flow.
3. Service Perspective: EC is a tool that addresses the desire of firms, consumers, and management to cut service costs while improving the quality of goods and increasing the speed of service delivery.
4. Online Perspective: EC provides the capability of buying and selling products and information on the internet and other online services.

2. What are the different applications of Ecommerce?

- Electronic Auctions: Traditional auctions had limited participation of people who turned up at the place of auction. Today, the same auction mechanisms can be implemented using electronic commerce technologies, allowing people connected through the internet to bid. Electronic auctions potentially encourage greater participation as internet users can connect to a web site- hosting an auction and bid for an item.
- Electronic Banking: Using E-commerce technologies, bank user records and all financial transactions can be done using the respective Bank's website. The user can also use the website to balance his check book, summarize credit card purchases, track stocks and other investments. With the wide availability and access to internet, electronic banking empowers activities such as accessing their accounts, carrying out debit and credit transactions, transfer funds, pay bills, review account history etc.
- Electronic Searching: The complete functionality offered by a telephone directory service provider can be offered through a single web interface using HTTP server, where a user can search for any details like products, person, place or any other information on the web.
- Education and Learning: The internet today is widely used as a delivery vehicle for training and learning as well. The web technology provides a uniform delivery mechanism for textual, multimedia and animated contents called as e-Learning, with the concept of delivering training over the internet. E-Learning has already taken powerful roots and is emerging most predominantly in the information technology universe, as IT professionals are more comfortable working with the new technology

and have access to high speed internet connections for the fast transmission required for media rich lessons.

3. Find the benefits of Ecommerce.

- Reaching a wider market segment irrespective of rich, poor, young, old, etc. Only thing is you should have an internet connection
- Distances do not matter in carrying out trade. You can reach the customer wherever he is located in the world, any time you want
- Availability of items 24 hours a day, 7 days a week and 365 days a year.
- Setting up an E-commerce website is cheaper compared to having a brick and mortar retail outlet.
- Wider choice for the customers
- Flexibility to add & remove items from the list easily
- Reduction in human errors due to automation
- Exposure to previously untapped market segments
- Availability of friendly advice
- Reduction in order processing cost & time
- Faster fund transfer
- Reachability of producer with consumer directly

4. Identify the Examples of e-Commerce.

- Online Shopping: Buying and selling goods on the Internet is one of the most popular examples of e-Commerce. Sellers create storefronts that are the online equivalents of retail outlets. Buyers browse and purchase products with mouse clicks.
- Electronic Payments: When you are buying goods online, there needs to be a mechanism to pay online too. That is where payment processors and payment gateways come into the picture. Electronic payments reduce the inefficiency associated with writing and mailing checks. It also does away with many of the safety issues that arise due to payment made in currency notes.
- Online Auctions: Physical auctions predate online auctions, but the Internet made auctions accessible to a large number of buyers and sellers. Online auctions are an efficient mechanism for price discovery. Many buyers find the auction shopping mechanism much interesting than regular storefront shopping.
- Internet Banking: Today it is possible for you to perform the entire gamut of banking operations without visiting a physical bank branch. Interfacing of websites with bank accounts, and by extension credit cards, was the biggest driver of e-Commerce.
- Online Ticketing: Air tickets, movie tickets, train tickets, play tickets, tickets to sporting events, and just about any kind of tickets can be booked online. Online ticketing does away with the need to queue up at ticket counters.

5. What are the different architectural model in B2B E-commerce?

Business-to-Business electronic commerce facilitates Inter-organizational interaction and transaction. Following are the architectural models in B2B e-commerce −

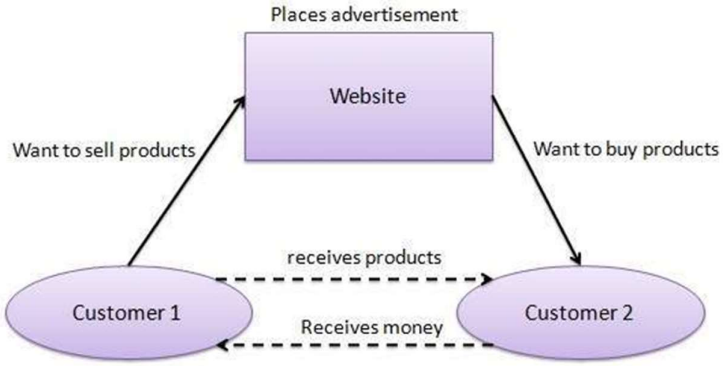
- Supplier Oriented marketplace − in this type of model, a common marketplace provided by supplier is used by both individual customers as well as business users. A supplier offers an e-stores for sales promotion.
- Buyer Oriented marketplace − in this type of model, buyer has his/her own market place or e-market. He invites suppliers to bid on product's catalog. A Buyer company opens a bidding site.

- Intermediary Oriented marketplace − in this type of model, an intermediary company runs a market place where business buyers and sellers can transact with each other.

6. With a neat diagram Explain how C 2C E-Commerce functions.

Consumer-to-consumer (C2C) electronic commerce gives the opportunity for consumers to transact goods or services with other consumers present on the internet. The C2C in many situations uses models that exchange systems with a modified form of deal making. For deal making purposes a large virtual consumer trading community is developed. The customer operates by the rules of this community to compete, check and decide his own basic selling and/ or buying prices. Traditionally, C2C electronic commerce has been conducted through both trading forums and intermediaries such as auctions, classified advertisements, and collectible shows.

It gives small firms and individuals the same opportunity as multi-national corporations. As a result, many individuals established online organizations that encouraged and assisted commerce between consumers. EBay's auction service is a great example of C2C e-com where person-to-person transactions take place every day. Other examples include sites like OLX.in, Quikr.com etc. where users can sell their second-hand items to other users online.



Questions for Application

1. Differentiate Ecommerce and Traditional Commerce.

Comparison Feature	Traditional commerce	E-commerce
Definition & Meaning	Traditional commerce focuses on the exchange of products and services through personal interactions	E-commerce focuses on the exchange of goods and services via the Internet
Accessibility	Limited to several hours during the day	Can be accessed anytime 24/7
Customer Interface	Customers interact with business face-face	Customers use computing devices to access and interact with business
Business Scope	Geographically limited to business location	Global business scope
Mode of Delivery	Instant	Time-consuming
Transaction	Manual	Automatic

Processing		
Product Physical Inspection	Can be done before purchase	Cannot be done before purchase
Maintenance	Easier to maintain this as the only warehouse is enough to store the goods.	It is cost effective as display and showcase of the products are required to attract the customers.

2. **Analyze the different phases of E-market with neat diagram.**

- **Information Exchange:** Here the e-commerce system may include banner advertisements, details of products or services and electronic catalogues providing information on pricing, quality, delivery and payment terms
- **Contract and Order:** In this phase, the order is placed and item is contracted by the customer.
- **Shipment and Payment:** This stage follows after the exchange of values, which may involve physical or electronic shipment. Payment in E-commerce can be done through credit cards, digital cash or any other electronic payment systems.
- **Customer Service:** If some of the item parts being delivered are faulty or missing, the customer can ask for a customer service for the product or replacement of that part or item.
- **Marketing** deals with activities like advertising of the product, product promotion, etc. The marketing element utilizes the data generated by customer support, along with any other feedback or feature references. These elements relate to each other in a circular fashion that over a period of time may promote further economic activity.

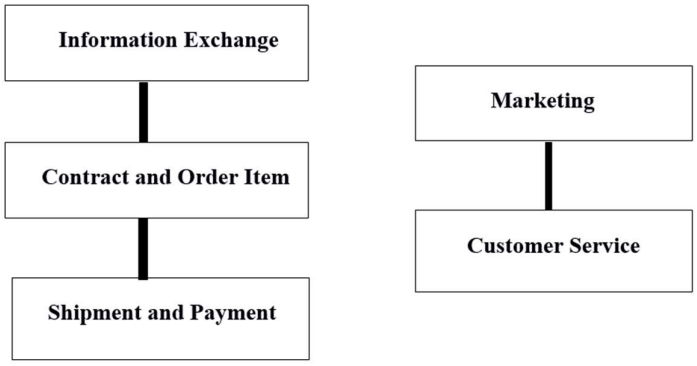
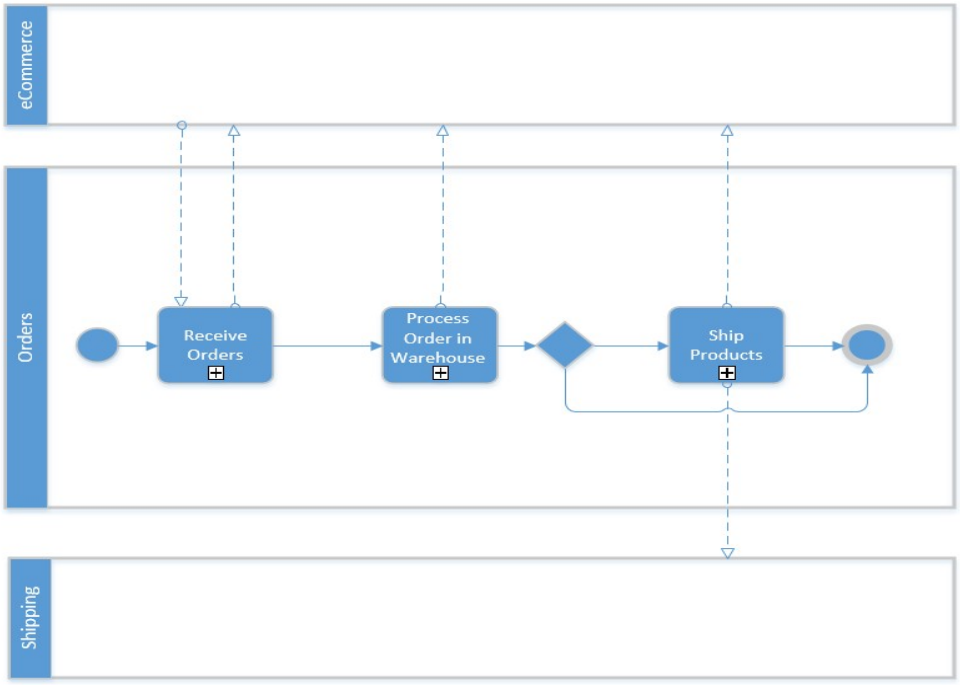


Fig 1.1 E–Commerce Market Elements

3. **Can you explain the Top-level ecommerce Process Flow with a neat diagram?**



Each top-level process highlighted below holds a number of additional subprocesses (+). For example, when a sales order hits your back office operations employees have to manually process the information into your business software. This can result in administration errors and create process bottlenecks further down the line. In an automated process employee intensive administration tasks are removed.

At the top level of an e-Commerce process flow, the following can be easily identified:

- Customer places an order in your e-Commerce system
- Order details are extracted from your e-Commerce system and entered into your business software
- Order is passed to the warehouse to be processed
- Order is placed for fulfilment

4. Demonstrate the detailed working of receiving orders with neat diagram.

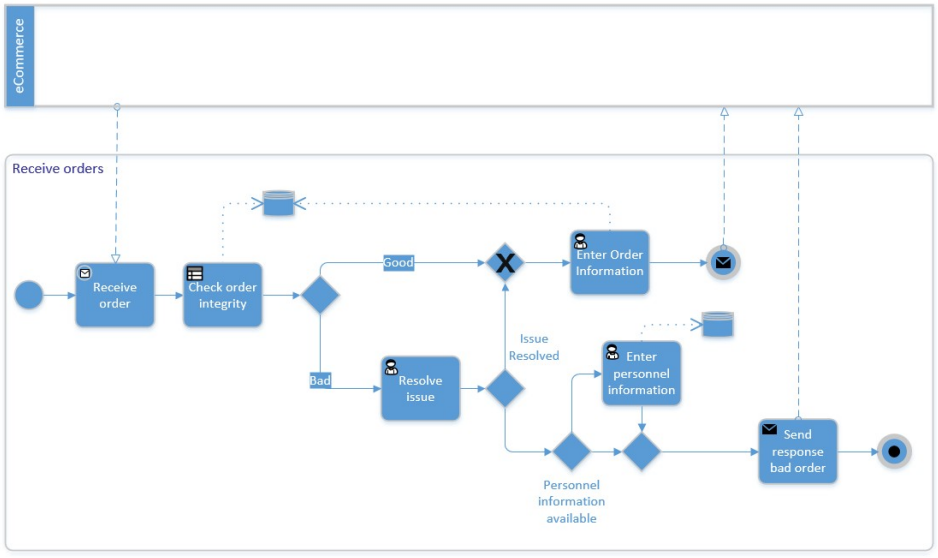


Diagram: Receiving orders from an e-Commerce system and placing into business software

- Sales order details are manually extracted from your e-Commerce system. Information includes customer information, description and ID of product ordered, payment details and transaction ID
- Employee manually checks sales order data for a correlation with your business rules e.g. full address, contact details, products ordered
- Employee manually enters order and customer details into your business software
- Employee manually creates and sends an order received notification to the customer
- If an employee identifies any anomalies they will need to contact the customer to resolve the issue
- If an issue cannot be resolved the employee may have to manually cancel the order
- Order is passed to warehouse for processing

5. **Can you explain how the Processing of an Order is done in the Warehouse with neat diagram?**

Once an order has been checked and processed in your business software, the order is passed onto the warehouse for processing. Here, employees will have to manually check the order against your pick list business rules (stock availability, item location etc.) and create and print a pick list.

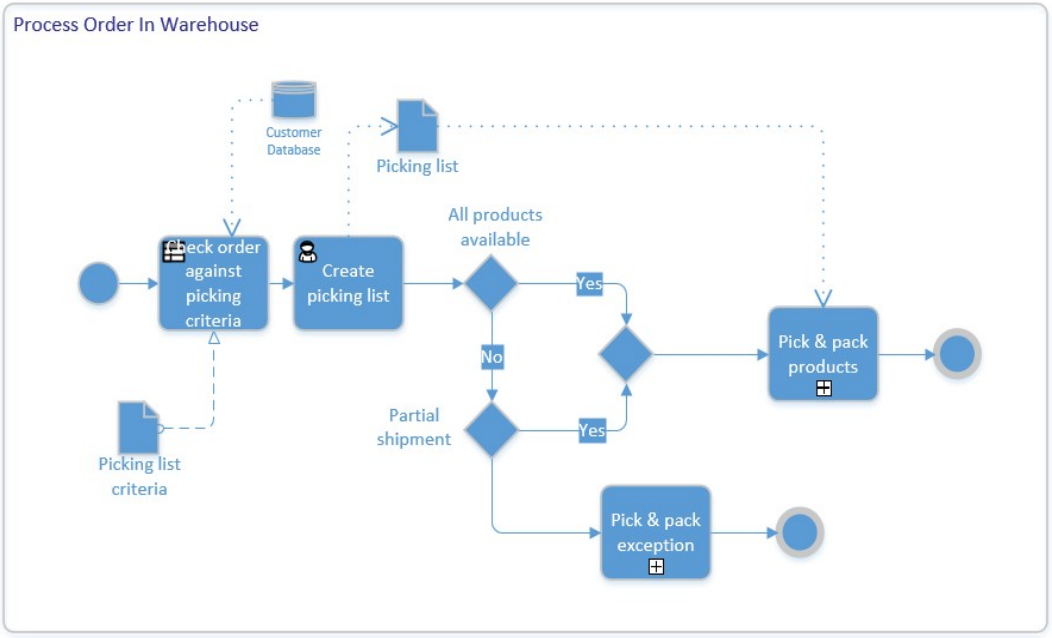


Diagram: Processing orders in the warehouse

- Employee notifies warehouse of an order that needs to be processed
- Employee manually checks the order against pick list criteria e.g. stock availability, item location in warehouse etc.
- Employee creates and prints pick list
- If products are in stock and available, the order is picked and packed
- Order is now ready for the shipping process

6. **Demonstrate the Processing of an Order for Shipping is done explain the concept with neat diagram.**

Once an order has been processed in the warehouse it is now ready to be passed to

shipping for fulfilment with a courier. Here, your business rules will determine which shipping route the employee chooses. Package data, such as weight, size, destination and costs, needs to be obtained. An employee will also need to manually print the shipping labels and contact the courier for fulfilment.

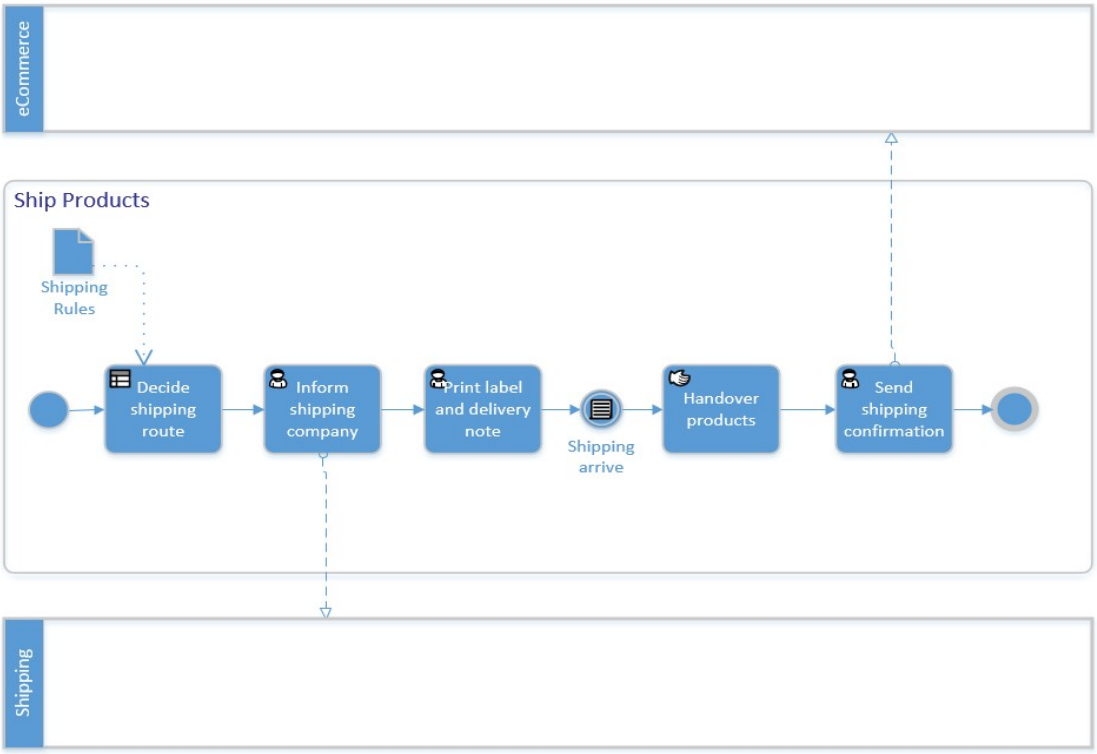


Diagram: Shipping products for fulfilment

- Employee enters package data, such as weight, size and destination into your courier provider system
- Employee prints shipping labels and delivery notes
- Shipping confirmation sent to customer
- Employee may or may not update your business software with tracking numbers
- Order handed over to courier for fulfilment

UNIT II

MULTIPLE CHOICE QUESTIONS

Questions for Understanding

a. Can you clarify which of the following describes a set of business entities and interrelationships among them?
   A. Business Model
   B. Account Model
   C. Transaction Model
   D. Inventory Model

b. What do you think, _____ provides the broad perspective necessary for identifying appropriate solutions at some level of abstraction.
   A. Business Model
   B. Account Model
   C. Transaction Model
   D. Inventory Model

c. Can you clarify, which allows the internet users a free download of internet products and applications?
   A. Business Model
   B. Account Model
   C. Transaction Model
   D. Freeware Model

d. What do you think the Full form of FTP is?
   A. File Transfer Protocol
   B. File Transfer Program
   C. Fund Transfer Protocol
   D. Fund Transfer Program

e. What do you think the Full Form of MTU is?
   A. **Message Transfer Agent**
   B. Message Transfer Aid
   C. Media Transfer Agent
   D. Media Timed Agent

f. Can you clarify, which field of Email has Blind of carbon copy recipients in it.
   A. To
   B. From
   C. CC
   D. **BCC**

g. Can you clarify, which field of Email has Short Title of the message?
   A. From
   B. Subject
   C. CC
   D. BCC

h. What do you think the Full Form of SMTP is?

A. **Simple Mail Transfer Protocol**
B. Small Mail Transfer Protocol
C. Sample Mail Transfer Protocol
D. Switched Mail Transfer Protocol

i. What do you think the Full form of CGI is?
A. Common gateway interface
B. Client gateway interface
C. Client gap interface
D. Common gap interface

j. Can you clarify, Server Response with value HTTP/1.0 200 means what?
A. OK
B. Not Found
C. Unauthorized
D. Forbidden

k. Can you clarify, Server Response with value HTTP/1.0 401 means what?
A. OK
B. Not Found
C. **Unauthorized**
D. Forbidden

l. What do you think the Full Form of DNS is?
A. Domain Name Server
B. Data New Server
C. Domain New Server
D. Data Name Sever

m. Can you clarify, which field of Email has Short Title of the message?
A. From
B. Subject
C. CC
D. BCC

Questions for Skill

n. Do you know _____ describes the sources of revenue and potential benefits accruing to the involved business participants?
A. Business Model
B. Account Model
C. Transaction Model
D. Inventory Model

o. Do you know _____ is the oldest catalogue of the web which is run by a loose confederation of volunteers?
A. Traditional Library
B. Virtual Library
C. Physical Library
D. Book

p. Do you know, _____ is based upon the exchange of information between individuals and organizations, over the internet?
   A. Business Exchange Model
   B. Traditional Exchange Model
   C. Information Exchange Model
   D. Discounted Exchange Model

q. Do you know, _____where companies and other organizations publish the details of their company and related information on their website?
   A. Native Content Model
   B. Native Transaction Model
   C. Transplanted Content Model
   D. Transplanted Transaction Model

r. Do you know, _____ is the one that collects a personal profile from its users and subsequently markets that data to interested set of users, while maintaining the data privacy?
   A. Infomediary Model
   B. Metamediaries Model
   C. Data Model
   D. Business Model

s. Which of the following achieves traffic aggregation for the e-retailer at almost no risk?
   A. Infomediary Model
   B. Metamediaries Model
   C. Affiliate Model
   D. Business Model

t. Do you know, a new breed of internet intermediaries who provide information mediation as well as transaction support are called _____.
   A. Infomediary
   B. Metamediaries
   C. Data
   D. Business

u. How many categories are present in Transplanted Transaction Models?
   A. 2
   B. 3
   C. 4
   D. 5

v. How many categories of Business models exist?
   A. 2
   B. 3
   C. 4
   D. 5

w. Do you know, sending the same message to several users at once is called as?
   A. Serial Transmission
   B. Broadcasting

C. Parallel Transmission
D. Unicasting

x. Do you know, a format of information which allows, in a computer environment, one to move from one part of a document to another or from one document to another through internal connections among these documents is called as?
A. Hyperlink
B. Linker
C. Loader
D. Connector

y. Do you know, the header information follows a standard format of header name and the value pair, separated by which sign.
A. :
B. ;
C. .
D. ,

Long Answers
Questions for Understanding

1. Explain native content based model.

Native content based models emerged due to the efforts of many amateurs who set up informational web sites expecting no financial returns. Also, a whole lot of software programs and utilities have been available for download-including much of the software that powers the internet-and world wide web which is available free of cost to users from many sites. Based on the nature of content the various models that have appeared include:

- **Information Content Model:** The web today is probably the largest source of information, available free of cost to the users. Many websites were set up, containing scientific, country, culture and tourism related information. The Information is typically available at no charge basis. It is typically utilized by agencies and groups interested in wide dissemination of information
- **Freeware Model:** This is a model which allows the internet users a free download of internet products and applications. Internet software companies have extensively utilized the freeware model to offer downloads of their products.
- **Information Exchange Model:** This model is based upon the exchange of information between individuals and organizations, over the internet. The information captured, during the interaction, about a person can be used for building the profile of individual users. The profile can be later utilized by target marketing and advertising companies for screening out and creating mailing lists.

2. Explain a transplanted content model.

This is a model where companies and other organizations publish the details of their company and related information on their website.

- **Subscription Model:** Content creators and publishers have relied on a subscription based service model. Entertainment and scientific journals, newsmagazines, and other periodic content have been offered, on a subscription basis.
- **Advertising Model:** Web sites providing content, e-mail, chat sessions, and discussion forums are utilized for serving advertisements to content viewers. **Banner advertisements** are served to millions of users visiting one of these popular sites for content or service. Charges are normally made on the basis of the number of times a

banner is served. When the user clicks on the banner he is taken to the web site of sponsor, providing him with more detailed information. The process is called the **click-through** and usually generates additional revenues.

- **Infomediary Model:** The infomediary model is based on the premise of lowering the interaction cost to consumers during the process of searching for suitable products/services and prices. Businesses based on the infomediary model, address the information demand of consumers by identifying the best deal for them. The infomediary model can also be used to recommend a suitable product to the consumer by matching the customers profile and desired attributes of the product, with the product profiles in its database.
- **Affiliate model:** The affiliate model achieves traffic aggregation for the e-retailer at almost no risk. The affiliate companies offer sales of other manufacturers or e-retailers' products on their web sites, for an incentive. The affiliate site redirects the sales transaction to the sponsoring e-retailer or manufacturer, where the actual transaction is carried out. The affiliate sites earn incentive revenue based on the value of each transaction.

3. Explain Digital Products Merchant Model.

The World Wide Web is particularly suited for merchandising digital products as these products can be described, experienced, as well as delivered over the internet. The music, video recordings, pictures, software products, books, documents and data bases are good examples of the products that are available or can be easily transformed into digital form. In this model, also known as the online transaction and delivery model, vendors of digital products or services offer their goods through a web site on the internet. Interested buyers of these goods and/ or services visit the site to obtain information about the products. The product information in a digital goods market may include samples, trial versions and demos, in addition to the usual product attributes and pricing. The buyer matches the acquired information with personal requirements and, if an adequate match is found, may decide to buy the product by clicking on to "buy now" button.

The buyer may select any of the valid online payment mechanisms supported and accepted by the merchant site, such as cyber cash, Master or Visa card, or other electronic payment modes, and provide the required payment related information. The seller, after validating the payment, information and confirming assured payment, initiates the electronic (on-the-wire) delivery of the digital product. Online delivery usually happens by downloading the digital product on the buyer's computer. In the case of services, it may offer the buyer access codes to obtain the service. Examples of these sites include Softwarebuys.com, Brothersoft.com, etc.

4. Illustrate Metamediaries model.

A new breed of internet intermediaries who provide information mediation as well as transaction support are called metamediaries. Metamediaries present the information from the users' viewpoint rather than that of the industry segments. With the information being organized by the industry, making multiple transactions for multiple products at multiple business sites inconveniences the users. The metamediary connects customers with providers of related goods and services that fill this need by offering them a virtual trading space called the metamarket, where not only can they acquire all the information but also execute transaction. The revenue model consists of charging a fee on all the transactions that occur of a metamediary's site. In the electronic market, the metamediary establishes itself as a third party web site that horizontally integrates industry segments and provides additional services such as payment settlement, fulfillment, delivery integration, credit offerings and verifications

The role of the metamediary is to provide a multi-vendor catalog that combines product

information from various vendors under a single site, providing buyers with a one-stop shopping experience. It may provide further value addition by including information on multiple dimensions of product comparison and product details like quality, inventory availability, as well as the guaranteed delivery dates. The metamediary may adopt the auction model, for transacting unique products with unknown pricing. The metamediary may also work as a forum that serves as an exchange for both buyers and sellers.

5. Explain transplanted transaction model.

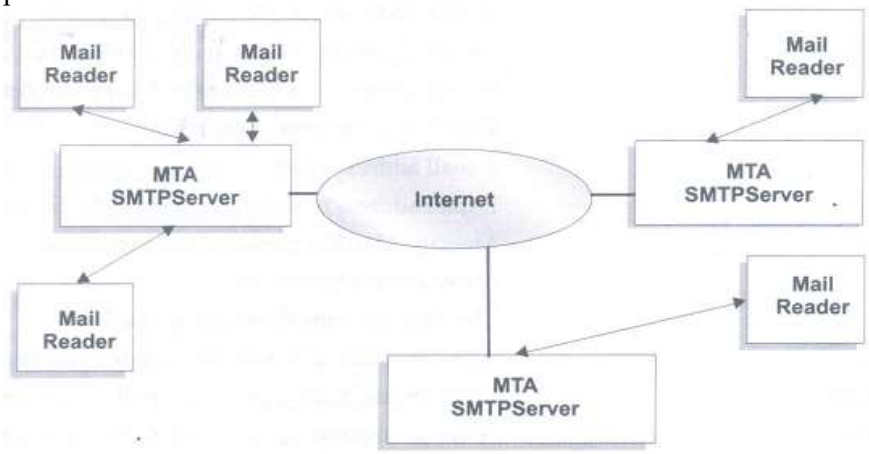
Storeowners, catalog-based sellers, manufacturers and brokers-financial, service insurance agents, travel services agents-adapted the traditional business model to increase their reach and reduce the market friction. Three of these models are described here.

- **Electronic Store Model:** Catalog based merchandising and mail order companies had a great presence in branded merchandise like audio and video systems and photo cameras, where customers were sure of the nature and quality of the product they were going to receive once they placed a mail/ phone order. The technological foundation of electronic commerce facilitated the task and was readily adopted by catalog-based sellers, and phone/mail order companies as they constructed the web based order business as an additional and more efficient channel.
- **Brokerage Model:** The market makers, also known as brokers, play an important role of facilitating transactions by bringing buyers and sellers together in traditional commerce. The brokers charge a fee or a commission on transactions that are facilitated by them. The brokerage model of traditional commerce has also been adopted in the electronic commerce and has been applied in all the types of e-commerce.
- **Manufacturer Model:** The manufacturer model is similar to the electronic store model, except here the seller happens to be the manufacturer himself. The manufacturer as a direct seller to the customer through the web offers numerous advantages in the area of customer support and service, product marketing and fulfillment of guarantees. Manufacturers have a better sense of customers' requirements, viewpoints, suggestions, and complaints with regards to the existing products, leading to improved product offerings and newer products.

6. lIllustrate e-mail concept.

An e-mail system is concerned with the ability to compose messages, move messages from the originator's site to the recipient's site, and report the delivery status to originators, browse messages by the recipients and finally the dispose off the messages. . You then send the message to the recipient by specifying the recipient's address. You can also send the same message to several users at once. This is called broadcasting. Sent messages are stored in electronic mailboxes until the recipient fetches them. To see if you have any mail, you may have to check your electronic mailbox periodically, although many systems alert you when mail is received. A typical architecture of the e-mail system consists of two components to accomplish the functionality- a user interface program and the message transfer server. The user interface, also often called mail reader, is a program that offers users an interface to compose a new message, read a message, reply to senders and delete or file the message. The user interface program (mail reader) provides three functions, i.e. composing, browsing, and disposition. Message Transfer Agent (MTA) programs accomplish the function of transferring the message to the destination. These programs communicate with each other using a standard protocol. A user agent composes a message which contains the destination mailbox address. The message transfer agent connects to the other message transfer agent running on the machine specified in the destination address of the composed message and delivers it through the standard message transfer protocol. In the internet environment the Simple Message Transfer Protocol (SMTP) has been widely adopted and message transfer agents using the

protocol are often referred to as SMTP servers.



7. Can you explain the combination of four basic ideas in World Wide Web?

The World Wide Web became extremely popular as the client programs or browsers available offered an easy to use graphical user interface and the ability to point and click in order to access any hyper-linked information. The server accepts browser requests and manages the delivery of documents to the browser. The documents contain hyper-links, rich text and multimedia information.

The World Wide Web is the combination of four basic ideas:

- **Hypertext**: A format of information which allows, in a computer environment, one to move from one part of a document to another or from one document to another through internal connections among these documents.
- **Resource Identifiers**: Unique identifiers used to locate a particular resource (computer file, document or other resource) on the network - this is commonly known as a URL. In the World Wide Web, unique Uniform Resource Locator (URL) defines each published document.
- **Markup language**: Characters Codes embedded in text which indicates structure, semantic meaning, or advice on presentation. The Hypertext Markup Language HTML is used for constructing these documents. An HTML file is a text file containing small markup tags which tells the Web browser how to display the webpage on the internet. The request-reply paradigm between the browser and the server follows a standard protocol, called HyperText Transfer Protocol (HTTP).
- **The Client-server model of computing**: A system in which client software or a client computer makes requests of server software or a server computer that provides the client with resources or services, such as data or files

8. Illustrate the fields used in RFC 822 message format.

The format of an e-mail message, composed by the user agent, is described in RFC-822, available on the internet. The original RFC 822 format was designed for handling text only mails, but later was enhanced to use multimedia extensions, by supplementing the header fields.

Header Field Name	Description
To	E-mail addresses of primary recipients
From	E-mail addresses of message creator
CC	E-mail addresses of carbon copy recipients' E-mail

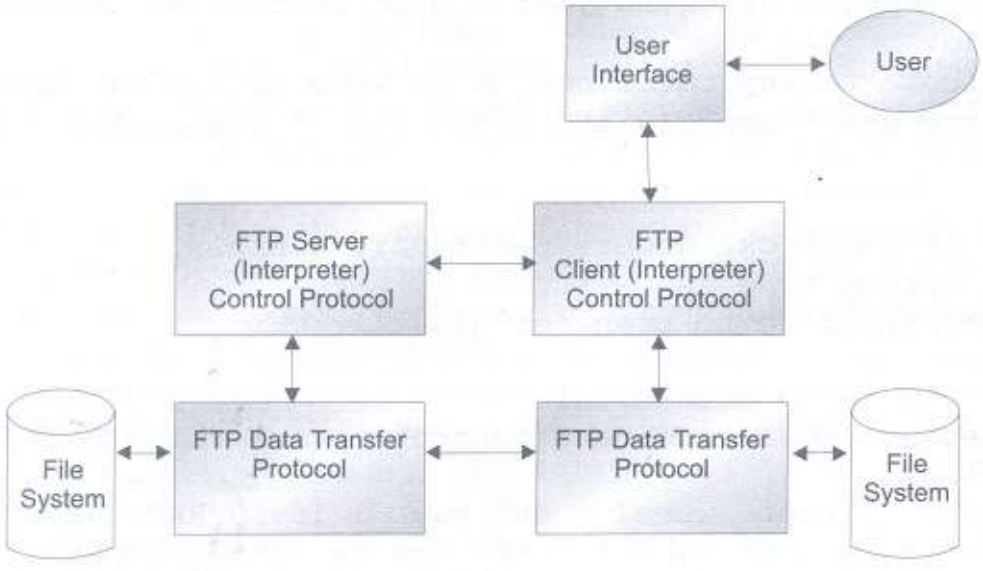
	addresses
BCC	Blind of carbon copy recipients
Sender	E-mail addresses of actual message sender
Reply To	E-mail addresses to which reply should be sent
Subject	Short Title of the message
Date	The date and time message was sent
Return path	Identifies the return path to the sender
Message Id	A unique identifier for referencing this message later

9. Write in your own words about FTP.

FTP or **F**ile **T**ransfer **P**rotocol is the protocol used for exchanging files over the Internet. There are two computers involved in an FTP transfer: a FTP server and a FTP client. The FTP server, running FTP server software, listens on the network for connection requests from other computers. The client computer, running FTP client software, initiates a connection to the server. Once connected, the client can do a number of file manipulation operations such as uploading files to the server, download files from the server, rename or delete files on the server and so on.

To transfer a file from the server machine to the client's machine (download), or transfer a file from client's machine to server's machine (upload a file). The FTP supports both batch as well as interactive uses. The protocol only specifies the mode of interaction between the FTP server and clients running on two computers; the user interface is left completely to the client designer.

The file transfer application operates through two connections, as control connection needs to be established prior to attempting any file transfers. On making the control connection the FTP server requests authorization information in the form of a user name and password. The authorization information determines whether the files can be accessed by the FTP user. Subject to access permissions, users can transfer files in either direction through "Get" or "Put" command. The files transfer application opens a new connection for the data transfer.



10. Write a note on Apache Web Server.

The Apache software foundation distributes the web server under a public domain software license policy. It can be freely downloaded and installed from the Apache web site (www.apache.org). The latest version of source files for installing the apache web server can be downloaded by browsing the location http://www.apache.org/dist/httpd/httpd -2 0 NN.tar.gz Files can be extracted, compiled, and configured through the 'makefile' provided as a part of the download.

Apache supports a variety of operating system platforms, including versions of Unix, such as AIX, BS200-0SD, Dgux, Digitalunix, Freebsd, Hpux, Irix, Linux, Netbsd, Netware, Openbsd, Osf/l, Solaris, and Sunos. Apache web server binaries are also available for Macosx, Macosxserver, Os/2, and Win32 environments.

Once the binary version has been compiled and created or downloaded, the installation process requires customizing configuration files for the server. The Apache server configuration directives reside in three main configuration files. The installation process sets up the environment to run the httpd from the default directory defined by the Server Root. The configuration files are located in the conf sub directory and are called srm.conf, access.conf and httpd.conf. The conf directory also contains sample configuration files named srm.conf-dist, access.conf-dist and httpd.conf-dist. These files can be copied and and edited to provide custom values for the directives. Inappropriate or erroneous setting of values for directives may lead to misconfiguration of the server or may even cause the server not to function, or still worse may lead to security gaps.

11. Illustrate the steps in a typical interaction of an HTTP session with a neat diagram.

Step 1: HTTP packets can be transmitted only after the client has established a connection with the server. In this step the browser parses the URL for identifying the domain name. It uses the services of Domain Name Server (DNS) to resolve the name into an IP address. Using the services offered by the TCP layer, it opens a connection to the IP address, at a standard web or URL specified port.

Step 2: The browser submits HTTP packets containing the request command to the connected server. The common HTTP request commands are "get", "post", and "head". The request in HTTP is made up of three components: the command method, resource identifier and the protocol version number.

Step 3: In this step the browser submits the header information to the server. The header information includes the browser identity, its capability to handle various types of content and the referring URL.
Step 4: On receiving the client request and header information, the server processes the request and sends the response to the client. If the request was processed and can be delivered, the server sends an OK response. Some common errors that it may send as responses include forbidden document, 'not found', 'internal server error', 'or' 'unauthorized access'.
Step 5: Prior to sending the requested data, the server sends information about the data, such as the type of content and length of content as well as information about the server itself, as part of the response phase.
Step 6: The server, after sending the last response header information, sends a blank line to indicate the completion of header portion the response and to mark the beginning of the response data. The server sends the response data to the browser in the format indicated in the content-type response header.
Step 7: The web server, on completing the data transmission, is done with responding to the client request. At this stage, it would ordinarily close the TCP connection. However, an HTML document may contain online images and embedded objects required for rendering it on the browser screen.

12. What is a business model? Mention different categories of e-commerce business models with taxonomy diagram.

A business model is defined as follows:

- A business model describes a set of business entities and interrelationships among them. The model describes the sources of revenue and potential benefits accruing to the involved business participants.
- The business model provides the broad perspective necessary for identifying appropriate solutions at some level of abstraction. The identified solution should be sustainable in terms of revenue and capable of realizing the stated objective.

Electronic commerce has grown at lightning speed due to growth in high speed internet connectivity and evolution in publishing, distribution, payment, and security technologies. To cope with the evolution, business models have been evolving at a meteoric rate. With the emergence of flat fee based internet service providers, online companies had to adjust their business model. With millions of web pages worth of information available on the internet, through flat rate access charges, the metered service became commercially unattractive.

Over the years, the business models that have emerged on the internet can be broadly classified into four categories:

- Native Content based Models
- Native Transaction Models
- Transplanted Content based Models
- Transplanted Transaction based Models

The taxonomy of the different business models are given in the below figure.

	Content	Transactions
Native	Information Content Model Freeware Model Information Exchange Model	Digital Products Internet Access Provision Web Hosting and Internet Services Metered Service Model Metamediary Model
Transplanted	Subscription Model Advertisement Model Infomediary Model Affiliate Model	Electronic Store Model Brokerage Model Manufacturing Model

Fig. 2.1 Taxonomy of Internet Commerce Business Models

UNIT III

MULTIPLE CHOICE QUESTIONS

Questions for Understanding

a. What do you think PR stands for?
   A. Purchase request
   B. Purchase requisitions
   C. Purchase receipt
   D. Purchase report

b. What do you think EDI stands for?
   A. Electronic Data Information
   B. Electronic Data Insurance
   C. Electronic Data Interchange
   D. Electronic Data Independent

c. What do you think EFT stands for?
   A. Electronic Fund Transport
   B. Electronic Fund Texting
   C. Electronic Fund Technology
   D. Electronic Fund Transfer

d. Can you clarify full form of DISH?
   A. Data Interchange for Shopping
   B. Data Interchange for Selling
   C. Data Interchange for Shipping
   D. Data Interchange for Securing

e. Can you clarify full form of ANSI?
   A. American National Standards Interchange
   B. American National Standards Information
   C. American National Standards Infrastructure
   D. American National Standards Institute

f. Can you clarify full form of ISO?
   A. International Standards Organization
   B. Internal Standards Organization
   C. Information Standards Organization
   D. Institutional Standards Organization

g. Can you clarify full form of TDI?
   A. Traditional Data Interchange
   B. Trade Data Interchange
   C. Temporal Data Interchange
   D. Transport Data Interchange

h. Can you clarify full form of FTP?
   A. File Text Protocol
   B. File Transport Protocol
   C. File Transfer Protocol
   D. File Trait Protocol

i. Can you clarify full form of HTTP?
   A. Hyper Transaction Transfer Protocol
   B. Hyper Trait Transfer Protocol
   C. Hyper Time Transfer Protocol
   D. Hyper Text Transfer Protocol

j. Can you clarify full form of VAN?
   A. Value-artificial network
   B. Value-action network
   C. Value-added network
   D. Value-access network

k. What do you think DISA stands for?
   A. Data Interchange Standards Association
   B. Data Interchange Standards Application
   C. Data Interchange Standards Accessories
   D. Data Interchange Standards Arrangement

l. What do you think, _____ refers to the network infrastructure that is used for the exchange of information between trading partners.
   A. Interconnection layer
   B. Internal layer
   C. International layer
   D. Information layer

m. What do you think, systems used by financial institutions are a prime example of the application of EDI in the banking and financial sector.
   A. EDI
   B. EFT
   C. ECG
   D. EGG

Questions for Application

n. Do you know, which process defines the relationship between a manufacturing organization and a consumer organization?
   A. Typical trading
   B. Conditional trading
   C. Computer trading
   D. Illegal trading

o. Do you know, _____ is the exchange of business documents between any two trading partners in a structured, machine-readable form?
   A. EDI
   B. EFT
   C. ECG
   D. EGG

p. Can you tell what is defined as any transfer of funds initiated through an electronic terminal, telephonic instrument, or computer to order, instructor authorize a financial institution to debit or credit an account.
   A. EDI
   B. EFT
   C. ECG
   D. EGG

q. Do you know, the general architecture of the EDI system consists of how many layers?
   A. Two
   B. Four
   C. Six
   D. Eight

r. The shipping industry devised a set of standards called _____.
   A. Data Interchange for Shopping
   B. Data Interchange for Selling
   C. Data Interchange for Shipping
   D. Data Interchange for Securing

s. Do you know, which standard is promoted by the United Nations Economic Commission, which is responsible for the adoption and standardization of messages?
   A. EFTFACT
   B. EDIFACT
   C. ECGFACT
   D. EDDFACT

t. Do you know, what is a convenient method for conducting EDI which provides functionalities related to connectivity and common services?
   A. Value-artificial network
   B. Value-action network
   C. Value-added network
   D. Value-access network

u. Do you know, the different transport networks interconnect using common network protocol standards is called as _____.
   A. TCP/UP
   B. TCP/UDP
   C. TCP/DNS
   D. TCP/IP

v. Can you tell, the common name space is implemented using the _____ and ensures that each machine on the internet has a unique name.
   A. Domain Name System (DNS)
   B. Digital Name System (DNS)
   C. Demand Name System (DNS)
   D. Data Name System (DNS)

w. What do you think, all published documents on the internet can be uniquely identified and located by a _____ address.
   A. United Resource Locator (URL)

B. Uniform Resource Locator (URL)
C. Union Resource Locator (URL)
D. Ultra-Resource Locator (URL)

x. Can you tell, Business service infrastructure includes _____.
A. Dictionaries and categories
B. Direction and categories
C. Directories and catalogues
D. Dictionaries and catalogues

y. Do you know which of the following is responsible for issuing licenses to and for regulating the certification authorities in India and maintains a directory of all the certificates as well?
A. Control of Certification Authorities (CCA)
B. Connection of Certification Authorities (CCA)
C. Categories of Certification Authorities (CCA)
D. Controller of Certification Authorities (CCA)

Long Answers

Questions for Understanding

1. Write in your own words about Electronic Data Interchange and Electronic Fund Transfer.

EDI is the exchange of business documents between any two trading partners in a structured, machine-readable form. It can be used to electronically transmit documents such as purchase-orders, invoices, shipping bills, receiving advices and other standard business correspondence between trading partners. EDI can also be used in exchanging financial information and payments in electronic form. EDI should not be viewed as simply a way of replacing paper documents and traditional methods of transmission such as mail, phone, or in-person delivery with electronic transmission. Rather, it should be seen as a means to streamline procedures and improve efficiency and productivity. EDI covers wide and varied application areas and, depending upon the perspective, has been defined in several ways.

The **Electronic Fund Transfer (EFT)** systems used by financial institutions are a prime example of the application of EDI in the banking and financial sector. EFT is defined as any transfer of funds initiated through an electronic terminal, telephonic instrument, or computer to order, instruct or authorize a financial institution to debit or credit an account. It deals with moving funds from one financial institution to another

2. Illustrate various services provided by VAN.

- Document conversion from one standard to another.
- The appropriate customer data can be saved in the VAN account and later appended on messages where required.
- Subscribers can interactively enquire about the status of any EDI transaction made by them.
- Subscribers can receive "verify acknowledgments" in the mailbox even when they are not online.
- The VAN can capture the specified data from transactions which, in turn, can be used for generating customer-specified reports.
- Subscribers can interactively enquire about the status of any EDI transaction made by them.
- Subscribers can receive "verify acknowledgments" in the mailbox even when they are

not online.

- The VAN can capture the specified data from transactions which, in turn, can be used for generating customer-specified reports.

3. Explain the role of online payment system in E-commerce.

Online payment is fundamental to the acceptance of electronic commerce as a viable alternative to traditional commerce. It is a mechanism that facilitates an online financial exchange between concerned parties and helps users to pay for an item they have bought online. In the case of large and established businesses deploying Electronic Data Interchange (EDI) for transactions, banks have been supporting the electronic payment mechanism through the **Electronic Fund Transfer (EFT)** channel. Several scalable and flexible electronic payment mechanisms-cash, cheques and credit cards have emerged, essentially imitating traditional payment mechanisms. Electronic payment mechanisms represent currency in the form of digital bits and require security and encryption mechanisms to ensure that it cannot be duplicated, reused or counterfeited and yet can be freely exchanged. In addition, these electronic payment systems also offer the confidentiality, integrity, and privacy of traditional payment systems. The electronic payment mechanisms evolved can be classified in to three major categories-pre-paid, instant-paid, and post-paid. The instant-paid mechanism requires equivalence to Government/Central Bank backed cash transactions. None of the electronic payment systems offer the equivalence to a Government/Central Bank guarantee like cash. Debit cards come closest to instant-paid electronic payment systems. The various electronic/ digital cash mechanisms are in fact prepaid payment systems.

4. Can you explain the services provided by networked multimedia content publishing in e-commerce?

The information distribution protocol, HTTP, delivers the documents written in the **Hypertext Markup Language (HTML)**, to the client program. The language offers an easy way for integrating multimedia content, residing in a variety of computers connected on the internet. HTML makes it possible to integrate the multimedia content in a document form and the integrated content then can be published using the HTTP servers. Clients can make requests, for the published information residing on HTTP servers. Clients submit requests to servers using the Hypertext Transfer Protocol. The servers respond to requests by locating and delivering the HTML document or error message to the client. The client programs, also known as browsers, parse and render the delivered HTML documents on the screen of the client machine. All published documents on the internet can be uniquely identified and located by a **Uniform Resource Locator (URL)** address. The URL address effectively serves as a unique name of the published document, worldwide.

The HTML is tag-based language and provides a rich set of tags that are used for designing the page layout, embedding multimedia objects, hyperlinking documents residing on the same as well as other internet connected machines. A simple HTML document can be developed in any standard text editor. In addition to HTML, the **Extensible Markup Language (XML)** has also emerged as a language for developing pages for the web. HTML is more concerned about how a page is formatted and displayed, while XML describes the actual content of a page. It simplifies the task of describing and delivering structured data from any application, thus, providing users with the ability to share and search the data in XML documents, in much the same way as we share and search data from databases and files. The actual multimedia content, i.e., the graphics, video clips, audio clips, and animated content can be developed by tools and editors available in the respective areas. Web technology, consisting of information distribution (HTTP) and publishing as well as integration (HTML and multimedia content editors), provides the two basic pillars on which electronic commerce applications are built.

5. **Illustrate different protocols and their services in the network service infrastructure.**

The network infrastructure forms the very basis of the electronic commerce, playing the role, in many ways, analogous to road/transport highways in the traditional commerce. The network infrastructure, known as internet, consists of heterogeneous transport systems. These different transport networks interconnect using common network protocol standards called **TCP/IP**. TCP/IP is concerned with the issue of providing a reliable data transmission mechanism for applications. All the computers connected / accessible on the internet share a common name and address space which uniquely identifies the machine

The common name space is implemented using the **Domain Name System (DNS)** and ensures that each machine on the internet has a unique name. The name here refers to the combination of the host and domain name. TCP/IP named after its two primary protocols - **Transmission Control Protocol (TCP)** and **Internet Protocol (IP)**, has emerged as a de facto standard of connectivity. In TCP / IP networks, the internet protocol layer delivers the IP packets from end to end in a connectionless format. The IP layer receives packets from the upper layers and injects them into underlying networks. In IP layers each packet is delivered independent of all other packets, thus in the process it may deliver packets out of the sequence in which they were sent. The transport layer in addition to TCP also supports a **User Datagram Protocol (UDP)**. UDP is an unreliable connectionless protocol. It is often used in applications, such as video and audio streaming, where prompt and constant delivery of data is more important than the in sequence and reliable delivery offered by TCP. It is also utilized by single packet request-reply applications, where speed of delivery is more important.

6. **Illustrate the essential technologies for ensuring security in an e-commerce environment.**

Wide connectivity and ready access to information also opens up sites to unwanted intruders. For electronic commerce to be viable, two important issues need to be addressed: protection of the source of information that is being made available online, and protection of the transaction that travels over the network.

The confidentiality or privacy of the transaction data can be addressed by using various encryption techniques. The **shared key** as well as the **public/private key** pair based encryption techniques can be used for the purpose. In addition to the confidentiality of the transaction issue, the other important issues is to ensure that the messages exchanged between two parties in a transaction have not been tampered with and assure that neither of the parties will repudiate the transaction.

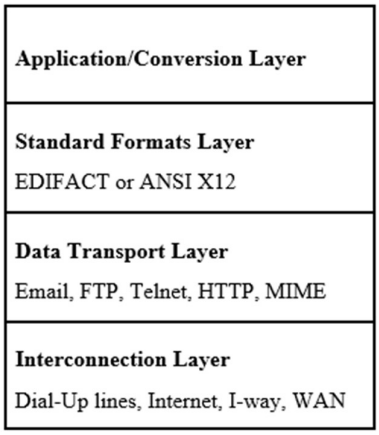
The process of identifying and authenticating transacting parties is essential in the electronic commerce environment. The task of authentication can be accomplished with the help of **Digital Certificates** signed/issued by a trusted certification authority. Encryption and digital signatures are used for ensuring message integrity and non-repudiation. The issue of protecting the information available on the electronic commerce site: Privacy, Secrecy and Tamper-proofing of information flow from one site to another. Encryption technologies based on shared key mechanisms such as **Data Encryption Standard (DES)** or **public-private keys** such as RSA algorithms have been utilized for addressing the issues of authentication, authorization, privacy and non-repudiation.

Questions for Application

1. **Analyze the building blocks of EDI system with a diagram.**

The two key concepts in an e-commerce system are electronic document exchange and electronic messages that need to be addressed for an EDI system to evolve. The electronic messages/documents that can be interpreted and understood by various purchase and order

processing the systems deployed at different vendors are heterogeneous in nature. Thus, evolution of a general purpose EDI system requires addressing of the problem of heterogeneity at two levels-exchanging documents over heterogeneous networks and the heterogeneity of document formats.
The general architecture of the EDI system consists of four layers:



- **The Application-conversion layer:** The application layer consists of the actual business applications that are going to be connected through the EDI systems for exchange of electronic information. These applications may use their own electronic record formats and document formats for storing, retrieving, and processing the information within each company's systems.
- **Standard message formats layer:** The important and critical building block of the EDI system is standards for business documents/forms. Since the sender and receiver in the EDI systems have to exchange business documents that can be interpreted by all parties, it has necessitated the development of form standards in EDI.
- **The Data Transport layer:** The content and structure of the purchase order is defined in the standards layer and is separate from the transport/carrier mechanism. The layer utilizes any of the available network transport services such as Electronic mail (E-mail), File Transfer Protocol (FTP), Telnet based remote connection and transfer or even the Hyper Text Transfer Protocol (HTTP) that drives the World Wide Web. Electronic mail has emerged as the dominant means for transporting EDI messages. EDI documents/messages are exchanged through the network infrastructure as electronic mail messages.
- **The Interconnection layer:** The interconnection layer refers to the network infrastructure that is used for the exchange of information between trading partners. In the simplest and most basic form it may consist of dial-up lines where trading partners dial-up through modems to each other and connect to exchange messages.

2. Analyse the framework of e-commerce with a neat diagram.

Electronic commerce applications require a reliable network infrastructure to move the information and execute a transaction in a distributed environment.

Fig. 4.1 Architectural Framework for Electronic Commerce

The framework describes various building blocks, enabled by technology, for creating new markets and market opportunities. The building elements of electronic commerce architecture are described as follows:

- **Network Infrastructure:** The network infrastructure forms the very basis of the electronic commerce, playing the role, in many ways, analogous to road/transport highways in the traditional commerce. Information, information goods and transactions move between the clients and commerce provider, through network highways.
- **Information Distribution Technology:** Information distribution and messaging technologies provide a transparent mechanism for transferring information content over a network infrastructure layer. It is accomplished through software systems that implement File Transfer Protocol (FTP), Hypertext Transfer Protocol (HTTP) and Simple Mail Transfer Protocol (SMTP) for exchanging multimedia contents consisting of text, graphics, video, and audio data.
- **Networked Multimedia Content Publishing Technology:** The information distribution protocol, HTTP, delivers the documents written in the Hypertext Markup Language (HTML), to the client program. The language offers an easy way for integrating multimedia content, residing in a variety of computers connected on the internet.
- **Security and Encryption:** The confidentiality or privacy of the transaction data can be addressed by using various encryption techniques. The shared key as well as the public/private key pair based encryption techniques can be used for the purpose.
- **Payment Services:** It is a mechanism that facilitates an online financial exchange between concerned parties and helps users to pay for an item they have bought online.
- **Business Services Infrastructure:** Business service infrastructure includes **directories and catalogues**. A hierarchical directory structure that classifies web sites based on the content in various categories, subcategories and further granularity of the same has been alternatively used for successfully locating the relevant information.
- **Public Policy and Legal Infrastructure:** The Controller of Certification Authorities (CCA) is responsible for issuing licenses to and for regulating the certification authorities in India and maintains a directory of all the certificates as well.

3. List and analyse benefits of EDI system.

- **Reduces Lead Time:** The process of transferring the documents/information is instantaneous, offering weeks of time savings compared to the traditional environment that used postal/courier based exchange of printed documents.
- **Improves Coordination with Suppliers:** On careful examination, it will be evident that much of the problems are caused either by delays in the transmission of printed documents, loss of documents in transition, or due to errors in the transcription of the printed information into the electronic form.
- **Reduces Redundancy:** Either trading partner can access, examine, and make a copy of the document from the electronic box instantly. Contrast it with the non-EDI system; it may take hours, or even days, to locate and retrieve a printed business document from the past.
- **Expands the Market Reach:** In the process of streamlining the purchase process they often institute a value-added network. By being a part of their value added network, many opportunities open up for supplying the material to some other larger suppliers who are also a part of the network.
- **Increases Revenue and Sales:** The efficiency brought about by EDI reduces the total transaction friction by eliminating paperwork and related errors that ensue. It also leads to quicker settlement of accounts. The reduced transaction friction saves money and the supplier is in a better position to offer the items at cheaper costs, leading to improved revenue realizations and sales.
- **Minimizes Transcription Errors:** Since the documents are sent and received in electronic form, the need to write the data on paper is not there and, as a result, hand-written transcription errors are totally eliminated.

4. What are some of the direct benefits and strategic benefits of EDI.

Direct Benefits of EDI

- Since the transfer of information from computer to computer is automatic, there is no need to re-key information. Data is only entered at the source.
- The cost of processing EDI documents is much smaller than that of processing paper documents.
- Customer service is improved. The quick transfer of business documents and marked decrease in errors allow orders to be met faster.
- Information is managed more effectively.

Strategic Benefits of EDI

- Customer relations are improved through better quality and speed of service.
- Competitive edge is maintained and enhanced.
- Reduction in product costs can be achieved.
- Business relations with trading partners get improved.
- More accurate sales forecasting and business planning is possible due to availability of information at the right place at the right time.
- There is improved job satisfaction among data entry operators, clerks, etc. when they are re-deployed in more creative activities.

5. What are the different application of EDI?

- The ability to exchange business documents electronically has been found to facilitate coordination between business partners, reduce the lead-time and thus reduce inventory.

- Although, large manufacturing and transportation companies were the early birds who recognized the advantages, any of the other industry segments also stand to benefit from electronic document exchange.
- The health care, financial sectors and cross-border trade facilitated through electronic document exchanges are some other sectors that adopted and derived the returns from EDI.
- Banking and financial payments like Large-scale or wholesale payments, Small-scale or retail payments and Home banking are also facilitated through EDI.
- Retailing payments through Credit cards, Charge cards, Smart cards or debit cards, Token-based payment systems through Electronic cash, Electronic checks etc are also done through with widely used EDI-based electronic ordering and billing processes.
- EDI software can also be used in e-mail and network services in order to send electronic purchase orders, invoices and payments back and forth.

6. Analyse the role of business service infrastructure in E-Commerce.

Business service infrastructure includes directories and catalogues. These are essential for identifying and locating businesses that meet customer requirements. The directories and catalogs refer to Business Directories and Yellow Pages used by customers to identify and locate businesses that are likely to provide the service or fulfill product demand in traditional commerce. Search engines and directory service providers like AltaVista, Google, Yahoo! Infospace, Bing, etc are identified and capitalized on the need by providing the service.

Search engines compile their databases by employing "robots", often called spiders, to crawl through the web space. The crawling is done by picking a page and then visiting all the links referred to in that page and in the process identifying and perusing the pages. Once the spiders get to a web site, they typically index words on the publicly available pages at that site. The engine scans its index for matching the key words and phrases typed by the user. The search engine maintains a database that contains correspondence between text terms and document URLs. Finally the search engines return the relevant URLs for the keywords or search terms entered by users. With millions of web pages on the internet, a simple search for any term or phrase may result in thousands of URLs. Thus, it is important for web site designers that their URL is ranked amongst the top few for the relevant terms and keywords.

A hierarchical directory structure that classifies web sites based on the content in various categories, subcategories and further granularity of the same has been alternatively used for successfully locating the relevant information. Many a time the entry in the directory and within that appropriate category is done after reviewing the content of a web site. This allows users to locate the relevant web site by navigating through the hierarchy.

UNIT IV

Multiple Choice Questions

Questions for Application level

a. Ca you tell, unusual attempt to gain access to a system, or to discover information about the system is called as?

A. Probe
B. Scan
C. Account compromise
D. Packet sniffer

b. Can you tell, large number of probes are called as?

A. Probe
B. Scan
C. Account compromise
D. Packet sniffer

c. Can you tell, unauthorized use of a computer account by someone other than the account owner is defined to be_____?

A. Account compromise
B. Packet sniffer
C. Root compromise
D. Exploitation of trust

d. Which of the following Program captures data from packets as they travel over the network?

A. Packet sniffer
B. Exploitation of Trust
C. Denial of services
D. Malicious code

e. Which among the following is Generic term for programs that cause undesired results on a system when executed?

A. Packet sniffer
B. Exploitation of Trust
C. Denial of services
D. Malicious code

f. Can you tell, preventing legitimate users from using a service is called as?

A. Denial of services
B. Root compromise
C. Account compromise
D. Exploitation of trust

g. Which among the following is Self-replicating programs that spread without any human intervention, after they are started?

A. Trojan
B. Worms
C. Virus
D. Malware

h. What is the Full form of VPN?

A. Virtual Private Network
B. Viral Private Network
C. Virtual Public Network
D. Viral Public Network

i. Do you know which avoidance of the unauthorized disclosure of information is?
A. Integrity
B. Confidentiality
C. Availability
D. Reliability

j. Do you know which is the computation of a function that maps the contents of a file to a numerical value?
A. Checksums
B. Cryptography
C. Confidentiality
D. Integrity

k. Can you tell how the denial of a commitment is or data receipt is defined as_____.
A. **Repudiation**
B. Denial of service
C. Probe
D. Disclosure

l. What is the discovery of the pattern of traffic between parties called as?
A. Disclosure
B. Traffic analysis
C. Masquerade
D. Repudiation

m. Which of the following checks for Information alteration during its transmission over the network?
A. Authentication
B. Integrity
C. Confidentiality
D. Authorization

n. Do you know which among the following is the conversion of electronic data into another form, which cannot be understood by anyone except authorized parties?
A. Cipher text
B. Simple text
C. Password text
D. Encrypted text

o. Can you tell the Full form of PEM?
A. Privacy Enhanced Mail
B. Privacy Enhanced Message
C. Public Enhanced Mail
D. Public Enhanced Message

p. Which among the following represents fixed length groups of bits?
A. Blocks
B. Group
C. Clusters
D. Set

q. Can you tell, the interception of information intended for someone else during its transmission over a communication channel is called as what?
A. Eavesdropping
B. Alteration
C. Masquerading
D. Repudiation

r. Can you tell Unauthorized modification of information can be called as which among the following?
A. Eavesdropping
B. Alteration
C. Masquerading
D. Repudiation

s. The fabrication of information that is purported to be from someone who is not actually the author is termed as_____?
A. Eavesdropping
B. Alteration
C. Masquerading
D. Repudiation

t. Do you know Conventional encryption is also called as _____?
A. **Symmetric**
B. Asymmetric
C. Two-way encryption
D. Public key encryption

u. Can you tell Synonym of Asymmetric Encryption is _____?
A. Shared key
B. Conventional encryption
C. Public key encryption
D. Complex key encryption

v. Which of the following RFC is used for message encryption and authentication procedures?
A. RFC 1421
B. RFC 1422
C. RFC 1423
D. RFC 1424

w. Which of the following RFC is used for certificate based key management?
A. RFC 1421
B. RFC 1422
C. RFC 1423

D. RFC 1424

x. Which of the following RFC is used for Algorithms, modes, identifiers?
A. RFC 1421
B. RFC 1422
C. RFC 1423
D. RFC 1424

y. Which of the following RFC is used for Key certification and related services?
A. RFC 1421
B. RFC 1422
C. RFC 1423
D. RFC 1424

Four Marks Questions
Questions for Skill

1. Find the different types of Security breaches.

- **Probe:** A probe is characterized by unusual attempts to gain access to a system, or to discover information about the system. One example is an attempt to log in to an unused account.
- **Scan:** A scan is simply a large number of probes, done by using an automated tool like continuously generating some random password and trying to login to a system.
- **Account Compromise:** An account compromise is the unauthorized use of a computer account by someone other than the account owner, without involving system level or root level privileges.
- **Root Compromise:** A root compromise is similar to an account compromise, except that the account that has been compromised has special privileges on the system.
- **Packet Sniffer:** A packet sniffer is a program that captures data from information packets, as they travel over the network.
- **Denial of Service:** The goal of the denial-of-service attack is to prevent legitimate users from using a service.
- **Exploitation of Trust:** Computers connected via networks enjoy privileges or trust relationships with one another.
- **Malicious Code:** Malicious code is a generic term for programs that cause undesired results on a system when executed.

2. What is DOS? Can you see the possible solution where denial of service can be prevented?

The denial of service attack brings the network to a state in which it can no longer carry legitimate users' data. The solution to most of these problems is to protect the routing update packets sent by the routing protocols in use. There are three levels of protection

1. **Clear-text password:** Passwords only offer minimal protection against intruders who do not have direct access to physical networks. Passwords also offer some protection against misconfigured routers. The advantage of passwords is that they have very low overheads, in both bandwidth and CPU consumption.
2. **Cryptographic checksum:** Checksums are some codes which you can add to the message which can only be identified by the receiver of the message. If the receiver gets the correct checksum after calculation, he is confirmed that the message has not been changed by any intruder or hacker. This helps to protect against the injection of spurious packets, even if the intruder has direct access to the physical network.

3. **Encryption:** Maximum security is provided by complete encryption of sequenced or uniquely identified, routing updates. This prevents an intruder from determining the topology of the network. The disadvantage of encryption is the overhead involved in processing updates.

3. Find the different goals of Security.

Cybersecurity is the protection of internet-connected systems, including hardware, software and data, from cyberattacks. In a computing context, **security** comprises **cybersecurity** and physical **security** both are used by enterprises to protect against unauthorized access to data centres and other computerized systems.

- **Confidentiality:** Confidentiality is the avoidance of the unauthorized disclosure of information. –confidentiality involves the protection of data, providing access for those who are allowed to see it while disallowing others from learning anything about its content.
    a. **Encryption:** The transformation of information using a secret, called an encryption key, so that the transformed information can only be read using another secret, called the decryption key.
    b. **Authentication:** The determination of the identity or role that someone has.
    c. Authorization: The determination if a person or system is allowed access to resources, based on an access control policy.
- **Integrity:** The property that information has not be altered in an unauthorized way.
    a. **Backups:** The periodic archiving of data.
    b. **Checksums:** The computation of a function that maps the contents of a file to a numerical value.
- **Availability:** The property that information is accessible and modifiable in a timely fashion by those authorized to do so.
    a. Physical protections: infrastructure meant to keep information available even in the event of physical challenges.
    b. Computational redundancies: computers and storage devices that serve as fallbacks in the case of failures

4. Find the different threats and attacks possible.

- **Eavesdropping:** The interception of information intended for someone else during its transmission over a communication channel.
- **Alteration:** Unauthorized modification of information.\
- **Denial-of-service: T**he interruption or degradation of a data service or information access.
- **Masquerading:** The fabrication of information that is purported to be from someone who is not actually the author.
- **Repudiation:** The denial of a commitment or data receipt. This involves an attempt to back out of a contract or a protocol that requires the different parties to provide receipts acknowledging that data has been received.

5. What is Sniffing? Can you see the possible solution on how Sniffing can be prevented?

Sniffing uses network interface to receive data intended for other machines in the network.

Sniffing can be prevented or at least its effects can be mitigated, through the proper understanding of these devices and deploying them in an appropriate configuration. Encrypting all the message traffic on the network ensures that the sniffer will only be able to get the encrypted text (chiper text) rather than the clear text information. The information will remain

protected, provided the encryption mechanism deployed is strong enough and cannot be easily broken.

Kerberos is another package that encrypts account information going over the network. It comes with a stream-encrypting remote login (rlogin) shell and stream-encrypting remote terminal (telnet) program. This prevents intruders from capturing the actions of the user, after he logs in. Some drawbacks of kerberos are that all the account information is held on one host, and if that machine is compromised, the whole network is rendered vulnerable.

The information can also be protected from sniffing based attacks by employing a zero-knowledge/ password authentication technique. This method is used for secure authentication without password usage. Networks that use this system have a client and a server that share a very long sequence of digits. During the client request for connection to a server, the server asks the client for a set of digits, in a small set of positions in the sequence. Since the no. of digits in the sequence is very long, the knowledge of a few digits is not sufficient for using it in a future attack, as the server inquires a different set of positions each time the client connects.

6. Find the different types of network transaction security issues.

- **Disclosure:** Release of message contents to an unauthorized person who is not supposed to see them.
- **Traffic analysis:** It refers to the discovery of the pattern of traffic between parties. In a connection-oriented application, the frequency and duration of connections can be determined. In either a connection oriented or connectionless environment, the number and length of messages between parties could be determined.
- **Masquerade:** It refers to the insertion of messages into the network from a fraud source. This includes the creation of messages by an opponent that are supposed to come from an authorized entity. This also includes some fraud acknowledgment of message receipt by someone other than the valid message recipient.
- **Content modification:** Changes to the contents of a message including insertion, deletion, transposition or modification.
- **Sequence modification:** It refers to the modification of the sequence of messages between parties, including insertion, deletion and recording of some sequenced packets by the intruder during transmission.
- **Timing modification:** It refers to delayed messages or replay of old message sequences that were recorded by intruder in an earlier transaction. In a connection oriented application, an entire session and sequence of messages corresponding to a full session could be recorded by an intruder and later replayed. The destination may think of it as a valid session and carryout the indicated transactions once more.
- **Repudiation:** It refers to the refusal of the receipt of message by the destination or the refusal of transmission of message by the source.

7. Find what Cyber security is, and what its type are.

Cybersecurity is the protection of internet-connected systems, including hardware, software and data, from cyberattacks. In a computing context, **security** comprises **cybersecurity** and physical **security** both are used by enterprises to protect against unauthorized access to data centres and other computerized systems.

Types of Cyber Security

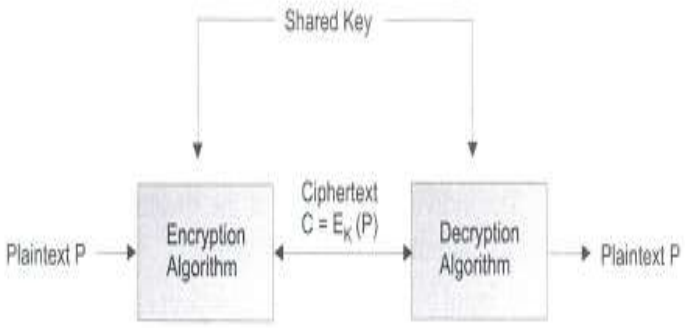
- **Information security** – Information security protects your information from unauthorized access, identity theft and protects the privacy of information and hardware that use, store and transmit data.
- **Network security** – Network security protects the usability, integrity and safety of a network, associated components, connection and information shared over the network.

When you secure a network, potential threats are identified and nullified from entering or spreading on the network.

- **Application security** – Application security protects applications from threats that occur due to the flaws in application design, development, installation, upgrade or maintenance phases.

8. Explain the symmetric key cryptosystem with a neat diagram.

In this, the same key is shared by both the sender and the receiver i.e the same key is used for encryption and decryption.



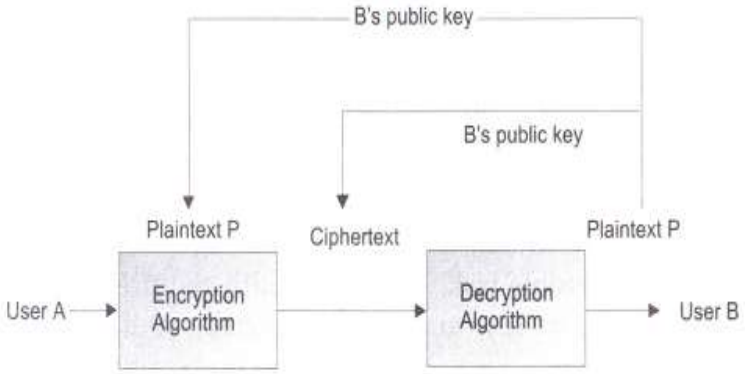
The encryption process consists of an algorithm and a key. The key is a value, which is independent of the plaintext that controls the algorithm. The output of the algorithm is dependent on the specific key being employed at the time of deciphering.

The ciphertext generated is transmitted over the network. At the receiving end, the ciphertext can be transformed back to the original plaintext by using a decryption algorithm, and the same key that was used for encryption. Mathematically, this model can be explained as follows:

- The plaintext P is encrypted by algorithm E and the key K to ciphertext C. The key K is kept secret.
  $C = E_K(P)$.
- The decryption algorithm is used to translate the ciphertext to plaintext using same key K.
  $P = D_K(C)$.
- E & D are mathematical functions or algorithms that encrypt and decrypt for the given key K
- Since the same key is being used to encrypt and decrypt original messages. It implies that
  $P = D_K(E_K(P))$.

9. Explain the public key cryptosystem with a neat diagram.

Public Key cryptosystems are also called **asymmetric** two key algorithms because two different keys are used for encryption and decryption of the messages. It is computationally infeasible to determine the decryption key given only the knowledge of the cryptographic algorithm and the encryption key. In short, for each public key there is a corresponding private key and the two keys together form a unique pair. Each end system in a network has a pair of keys to be used for encryption and decryption of messages that it is going to receive. Each system publishes its encryption key known as public key by placing it in a public register or file where it is accessible to all. The companion key to be used for decryption is known as the Private Key and is kept a secret.



The steps in a communication sequence are as follows:

- A wants to send the plaintext P to B. B has a related pair of keys: a public key EB which is available publicly, and a private key DB, known only to B. A encrypts P with EB to generate ciphertext $C = E_{EB}(P)$, and sends the result to B.
- B, on receiving this message, decrypts it with his private key DB to retrieve the plaintext $P = E_{DB}(C)$
- Since the original message P is retrieved from the ciphertext by the decryption operation, it follows that $P = E_{DB}(E_{EB}(P))$.

10. Determine the principle of cryptography and define cipher-text.

Encryption is the conversion of electronic data into another form called cipher text, which cannot be understood by anyone except authorized parties. Cipher text is the encrypted text. Plain text is what we have before encryption and cipher text is the encrypted text. Cryptographic systems can be classified along 3 independent dimensions.

1. **The methodology used in transforming the plaintext to cipher text:** Encryption algorithms are based on 2 general principles.
   a. **Substitution:** Individual elements in the plaintext are mapped into another element or a group of elements by using a chart or a fixed pattern in order to disguise them.
   b. **Transposition:** The individual elements of the plaintext are rearranged.
2. **The number of keys employed by the algorithm.**
   a. **Symmetric, shared key or conventional encryption:** In this, the same key is shared by both the sender and the receiver i.e the same key is used for encryption and decryption.
   b. **Asymmetric, two way or public key encryption:** The sender uses one key for encryption and the receiver uses another key for decryption.
3. **The manner in which the original plaintext is processed**
   a. **Stream cipher:** In a stream cipher each plaintext digit is encrypted one at a time, to give a digit of the cipher text stream.
   b. **Block cipher:** This operates on fixed length groups of bits called blocks.

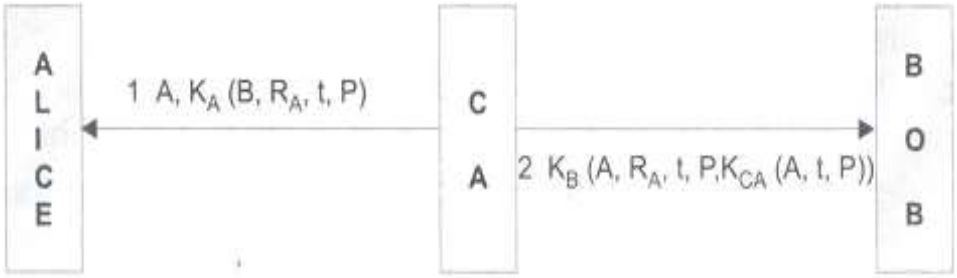
11. Find how the secret key signature key works and define digital signature.

The digital signature is to the electronic world what the handwritten signature is to the traditional commerce. **Secret Key Signatures** approach involves a central authority that is trusted by everybody. Each user shares his/her secret key with the Certification Authority (CA).

Alice wants to send a signed plaintext to Bob. She generates the string (B, R_A, t, P) where B is the receiver Bob, P is the plaintext, t is the time-stamp and R_A is the random number and then encrypts it with her secret key K_A. This, along with her identity, is sent to CA as

message 1. The CA, on observing the message from Alice, decrypts it with her key K_A and extracts the plaintext P, time-stamp t and the random number R_A. CA then combines these strings and signs it with its own signature K_{CA}. This encryption, along with A, R_A, t and P, is again scrambled using Bob's secret key to form the message 2 and this is sent to Bob.

Bob decrypts it with his secret key, K_B to extract P and K_{CA} (A, t, P). The signed message from CA is stored by Bob as a proof that Alice had sent P to Bob. In case of any dispute, when Bob claims to have received the message from Alice and she denies it, the CA can decrypt the K_{CA} (A, t, P) portion of the message received by Bob and verify the fact that the message was indeed sent by Alice to Bob.



12. Find the mechanism of PGP working.

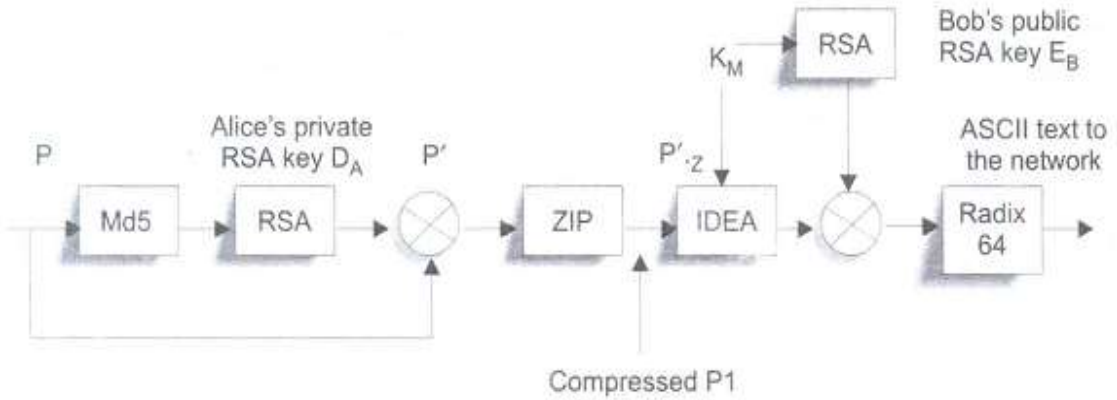
Pretty Good Privacy is a comprehensive e-mail security package that addresses privacy, authentication, confidentiality, digital signatures and compression issues.

Mechanism of PGP: Alice intends to send the plaintext message P, to Bob, in a secure manner. The public and private keys of Alice are E_A and D_A, respectively. For Bob the corresponding keys are E_B and D_B.

Alice types the message P and runs the PGP program on her workstation. The program hashes the message P using MD5 and then encrypts the result with Alice's private RSA key, D_A. The encrypted hash and the original message are concatenated into a single message P' and compressed using the ZIP program, resulting in output P'.zip. Alice, on being prompted by the PGP program enters a random input. The content and the typing speed are used to generate a 128-bit IDEA message key, K_M. The P'.zip is encrypted using the newly generated key, with IDEA in cipher feedback mode. K_M is encrypted with Bob's public key, E_B. The two components are concatenated and converted to base-64. The resulting message then contains letters, digits and the symbols like +, / and =, and is sent unmodified.

Bob, on receiving the message, reverse the base-64 encoding and decrypts the IDEA key using his private RSA key, D_B. This IDEA key is then used to decrypt P'.zip. After decompression, Bob separates the plaintext from the encrypted hash, decrypts the hash with Alice's public key, and verifies the integrity of the hash. If the plaintext is in agreement with his MD5 computation, it confirms that the message was correct and was sent by Alice. PGP provides the user with several RSA key size options, depending on the desired level of confidentiality:

- Casual (384 bits): known to be breakable, but with much effort.
- Commercial (512 bits): possibly breakable by three-letter organizations.
- Military (1024 bits): generally believed to be unbreakable


RSA
Bob's public
RSA key E_B
K_M
Alice's private
RSA key D_A
P
P'
P'.Z
ASCII text to
the network
Md5
RSA
ZIP
IDEA
Radix
64
Compressed P1

UNIT V

Multiple Choice Questions

Questions for Understanding level

a. What do you think, Poor e-banking planning is connected with _____?

A. Strategic Risk
B. Legal Risk
C. Market Risk
D. Customer Risk

b. Can you clarify, the License to issue digital signature certificates are issued by _____?

A. Finance Minister
B. Banks
C. Controller
D. User

c. Can you clarify, Key used to create digital signature is _____?

A. Public key
B. Private key
C. Linear key
D. Normal key

d. What do you think, For which card one has to make advance payment?

A. Smart card
B. Gold card
C. Debit card
D. Credit card

e. What do you think, Smart cards are based in _____ standards.

A. SET
B. MIME
C. HTTP
D. TULIP

f. What do you think, Digital signature certificated are issued by _____?

A. Central government
B. State government
C. Certifying authority
D. User

g. What do you think, The primary type of website used for e-banking is _____?

A. Information
B. Transaction
C. Both A and B
D. Normal website

h. Can you tell, PIN in ATM card id of _____?

A. 4 alphabets
B. 2 alphabets and 2 digits
C. 4 digits

D. 1 digit

i. Can you tell which one of the following is a safety measures in banking network?
A. Router
B. Firewall
C. Modem
D. Switch

j. What is e-sign act?
A. Electronic sign act
B. Electronic signatures in global and national commerce act
C. Electronic signatures in national and global act
D. Electronic act

k. Who can pass the law for e-banking?
A. RBI
B. Merchant association
C. Parliament
D. State government

l. What is the full form of ATM?
A. Automatic Transaction Machine
B. Advanced Teller Machine
C. Automated Teller Machine
D. Accurate Teller Machine

m. Can you tell, Intrusion detection system helps in what?
A. User enrolment
B. Rapid intrusion detection and reaction
C. Training
D. Independent testing

Questions for Skill level

n. Do you know, Payment gateways are used for what?
A. Interbank
B. Delivery process
C. Purchase
D. Client

o. Do you know, which is used to converts data transmission protocol between network?
A. Gateway
B. Switch
C. Hub
D. Router

p. The customer access e-banking services using _____?
A. PC
B. PDA
C. ATM
D. All of the above

q. In credit card what is the grace period of payment?
A. 10 - 15 days
B. 5 - 20 days
C. 15 - 45 days
D. 1 - 2 days

r. The most common payment especially for low value purchase, is made by _____?
A. Debit card
B. Credit card
C. Cash
D. ATM

s. Transactional e-banking is typically a front end system. That realises on a programming like _____?
A. Inter phase
B. Interlink
C. Inter join
D. Internal

t. Do you know, For which card one has to made advanced payments?
A. Credit card
B. Debit card
C. Smart card
D. Gold card

u. Knowing someone else password by certain illegal means is _____?
A. Hacking
B. Plagiarism
C. Log on script
D. Password policy

v. Do you know, Loss of trust due to authorized activity on customer account is concerned with _____?
A. Reputational risk
B. Liquidity risk
C. Market risk
D. Identity risk

w. The potential hard for informational website e-banking is _____?
A. Viewing account
B. Spreading virus
C. Checking balance
D. Making online payment

x. Can you tell, A debit card/ ATM card is a _____ digit numbers?
A. 12
B. 13
C. 16
D. 10

y. Can you tell, Securer electronic transaction is a _____?

A. Protocol

B. Transaction type

C. Security agency

D. JSP

Four Marks Questions

Questions for Understanding level

1. Illustrate the different categories of payment systems.

Based on the size of payment, all payment transactions can be classified in the following three categories:

a. Micro Payments: These transactions usually involve ones that have very low payment value. At times, the value of a transaction may be a fraction of a currency unit. Typically, transactions that are of five or lesser currency units, in case of dollars and fifty in case of the rupee, are treated as micro payments. Since, the transactions are of such a low value, even a small overhead or a minimum overhead may become unbearable. Thus, systems for micro payments have to ensure near zero overhead in order to make them viable.

b. Consumer Payments: These payments typically involve values of five to five hundred currency units, in the case of dollars and euros, and may be 50-5000 units, in case of the rupee. These are the dominant form of payment transactions, as most of the consumers buying in a single shopping trip fall under this category.

c. Business Payments: Usually transactions that are of higher amounts-five hundred and above in case of dollars or five thousands and above in case of rupee-are treated as business payments. Businesses payments usually have an invoice associated with them. Business-to-Business payment transactions are in the higher range, and fall in this category.

2. Illustrate the different types of prepaid electronic payment systems.

- **eCash:** eCash is a purely software based, anonymous, untraceable, online token payment system available on Unix, Windows, as well as Macintosh platforms eCash attempts to replace paper cash as the principal payment vehicle in online payments. It combines computerized convenience with security and privacy that improve on paper cash eCash can be held and used by anyone, even those without a bank account. eCash allows for bi-directional payments. There is no distinction between customers and merchants with regards to payments. Both sides can give and receive payments. However, since the system is coin or currency based, it requires clearing of coins by its issuing bank.
- **Mondex (E-Wallet):** The Mondex purse or eWallet is a **smart card** alternative to cash. The Mondex purse, a self-standing value store, requires no remote approval of individual transactions. Rather, the mondex value equivalent to cash is stored in the card's microchip. The purse also stores secure programs for manipulating that value and for interfacing with other Mondex cards or terminals. After withdrawal from an ATM, the value (money) can be transferred from one card to another via a special, password protected, electronic wallet. The first implementation of Mondex supports upto five different currencies, each separately accounted for by the card.
- **NetBill:** NetBill has been conceived to address the problem of buying information goods over the internet. As opposed to the physical goods purchased on the internet, and shipped later by the merchant, the information goods are themselves transferred over the internet, to the customer. Preferably, this transfer should take place immediately after purchase.

Hence, the issues to be addressed in such a transaction are very different from these on transactions involving physical goods.

3. **Write in your own words the major impediments faced by the mobile commerce environment.**

- **Mobile Screen Resolutions:** In web browsing users can get a rich experience of browsing the product details on 800x 600 pixel sized screens with rich colors and a tool set to offer 3-D and even video experience.
- **User Interface:** Mobile devices offer menu based scroll and click interface. The physical lightness and small-size of the device poses limitations in the development of convenient input and display interfaces.
- **Memory:** Mobile devices also have limited computing power and memory and storage capacity. As a result, they are unable to run and support complex applications.
- **Security Concerns:** Mobile commerce operates over wireless networks making it more vulnerable to intruders compared to wired infrastructure. In the wired network, the intruder has to gain physical access to the wired infrastructure while in the wireless network the intruder can be anyone with the ability to receive signals on his wireless intrusion device. Also, from the technology standpoint, the wireless infrastructure is faced with the following security related concerns.
- **Competing Web Language:** Mobile devices cannot handle full-fledged Hyper Text Markup Language (HTML) documents. In order to offer web access and offer similar services, two competing but incompatible standards have emerged. The mobile devices that adopt Wireless Access Protocol use Wireless Markup Language (WML) for mobile commerce applications, while the NTT DoCoMO's iMode devices use a condensed version HTML (CHTML). In order to enable voice access and interface for displaying web content, VoiceXML, a new markup language, has also emerged. Incompatible standards make the task of mobile commerce application and service providers even more complex.

4. **Can you write a brief outline about requirement metrics of a payment system?**

- **Transaction:** Transaction, in the context of payment systems, refers to the actual exchange of currency with the goods or documents being transferred. Every transaction should exhibit the following characteristics.
- **Security:** Security, in the context of payment systems, refers to the system's ability to protect all parties from frauds, due to interception of online transmission and storage.
- **Interoperability:** The interoperability of the payment systems refers to its ability to operate in multiple online as well as offline payment environments.
- **Scalability:** Scalability refers to the level of operations possible within a certain payment system. The payment systems should be able to support many consumers buying goods at the same time from many merchants, even under peak conditions. The service should be scalable for the load performance, and efficient for the micro payments as well as general payments.
- **Economy Issues:** In order to become an accepted economical instrument, a digital payment system needs to provide a trusted, reliable and economically feasible service to a sufficiently large user community.

5. **Write in your own words the different activities that can be performed using M-Commerce.**

The different activities that can be performed using M-Commerce are as follows:

- Paying for and downloading ring tones, mp3 music, news or information services
- Receiving parking meter expiry, alerts on handheld devices and paying for additional parking time
- Enquiring the airlines, train or dynamic bus arrival schedules
- Enquiry, reservation and purchase of airlines tickets through mobile wireless devices
- Enquiring about stock market conditions and placing a stock purchase or sales order through the mobile devices
- Receiving the location-specific information regarding restaurants, entertainment complexes through mobile device
- Receiving location-specific advertisement and product discount coupons in the current neighborhood

6. Illustrate the factors that are essential for Mobile Commerce payment.

Some of the factors that are essential of newer payment systems are:

- **Simplicity and Usability:** The availability of a wide range of goods and services, geographical availability of the service and reliable and effective delivery of goods are other important factors that make a payment system usable and simple.
- **Universality:** A single integrated platform of payment service that can satisfy the need any systems in of person-to-person (P2P), business-to-consumer (B2C), and business-to-business (B2B) payments in geographically spread out markets that are domestic, regional and global.
- **Interoperability**: In any financial payment system, the user should be ensured of interoperability amongst the multiple payment systems, as the world is going to remain heterogeneous in nature and many modes of payments may remain in existence.
- **Security, Trust, and Privacy:** Trust is the most important aspect of any payment system. The trust can be build by technology-based assurance against fraud and other security issues. Unless, users are assured that the mobile payment system follows tried, tested and true secure banking practices, it is unlikely that users will adopt it. The user should also have option to assure the privacy while making payments.
- **Cross-Border Payments:** In the emerging global market place, a good payment system that is likely to find a wider adoption is one in which it is possible to make cross-border payments almost as easily as local payments.
- **Cost Effective:** The mobile payment system should be cost effective compared to the existing payment systems. Since the cost of per payment transaction is dependent on the overheads, infrastructure, and operational cost, the technology and economy of scale are important factors.
- **Speed:** Mobile and technology savvy users are looking for speed of transaction. A mobile payment method should decrease transaction time and automate transactions.

Questions for Application level

1. Analyse the working of Mondex electronic payment system.

The Mondex purse or eWallet is a **smart card** alternative to cash. The Mondex purse, a self-standing value store, requires no remote approval of individual transactions. Rather, the mondex value equivalent to cash is stored in the card's microchip. The purse also stores secure programs for manipulating that value and for interfacing with other Mondex cards or terminals. After withdrawal from an ATM, the value (money) can be transferred from one card to another via a special, password protected, electronic wallet.

- **Transaction:** Customer loads value (money) onto the card either from an ATM

machine or from a phone. On purchase of an item, the customer provides his card to the merchant's point of sale device and authorizes the transfer of a certain value. The amount is electronically deducted from the chip inside the customer's card and added to the amount on the retailer's chip. All this is accomplished without accessing the customer's bank balance or checking his or her credit worthiness.

- **Security:**

Just like cash, if a smart card is lost or stolen, the cardholder loses real money. However, the Mondex card has a unique feature that allows cardholders to lock the value on the card with a four digit personal number, thereby safeguarding the value held on the card. The system uses special purpose hardware on smart cards to ensure its cryptographic security. An important point about Mondex transactions is that value can only move from one Mondex card to another and can only be stored on Mondex cards.

2. Analyse the working of NetBill electronic payment system.

NetBill has been conceived to address the problem of buying information goods over the internet. As opposed to the physical goods purchased on the internet, and shipped later by the merchant, the information goods are themselves transferred over the internet, to the customer. Preferably, this transfer should take place immediately after purchase. Hence, the issues to be addressed in such a transaction are very different from these on transactions involving physical goods.

- **Transaction:** The customer buys information goods from the merchant. The Merchant sends goods, in encrypted form, to the customer. The customer software verifies that the goods were received correctly & sends verification of this to the merchant software. The merchant submits the verification message received from customer, the account information provided by customer and the decryption key to the NetBill server. The NetBill server verifies that the customer has sufficient money in the account to pay for the goods. In case of sufficient funds, it transfers funds, stores the decryption key and sends the report to the merchant software. The merchant then sends the customer decryption key, which the software on the customer machine uses to decrypt the goods. In case the merchant server fails to deliver the decryption key, the software on customer server can acquire the key from the NetBill server.

- **Security:** NetBill uses a combination of public key cryptography and symmetric key cryptography to make sure that all NetBill communications are secure and all transactions are authorized. NetBill's approach is based on the well tested Kerberos protocol, which is a network authentication system for that allows entities communicating over networks to prove their identity to each other, while preventing

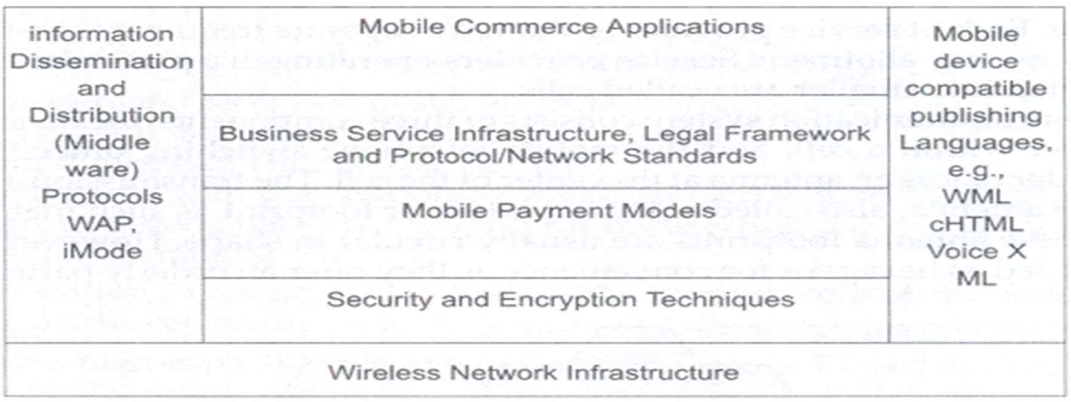
eavesdropping. It also provides for data stream integrity (detection of modification) and secrecy (preventing unauthorized reading) using cryptography systems such as DES (Data Encryption Standard).

3. What are the important revenue streams in developing business in m-commerce?

With the growth in the number of mobile users with data access, several sources of revenue streams have become possible. Some of the important revenue streams that are possible in the mobile commerce value chain are as follows:

1. **Mobile Connect-time Communications -** Subscription to the mobile basic connectivity services, short messaging services, and other add-ons come at a charge.
2. **Mobile Equipment and Device Providers -** Mobile infrastructure builder and equipment providers operating the network and manufacturing handheld devices are major source of revenue generation in the mobile commerce economy.
3. **Value-Added Services -** Subscriptions to specific services such as news headlines, sports score, entertainment related information, downloading of ring-tones, bill payments, stock market ticker information, and notification services are some the services that are often provided through mobile services.
4. **Mobile Application Developers** - Early adopters of mobile technology and its applications had to develop their own application services and incurred heavy expenses.
5. **Mobile Commerce Applications Service Providers (MASP)** - MASPs are the new intermediaries that quickly enable mobile commerce in these businesses and help them, in keeping up with the evolution. A MASP free corporate clients by hosting their content using its own infrastructure and offers, anytime anywhere access.
6. **Portals** - A portal in this context usually refers to web sites that serve as entry points for accessing the content and services available on the Internet. Portals aggregate a large number of users and content providers.

4. Analyze the architectural framework of m-commerce with a neat diagram.



- **Wireless Network Infrastructure:** This layer is also called as the **Information Superhighway**, as it is used to move and execute the transactions in the mobile commerce environment using dedicated network cables which may be wired or wireless cables. It is the combination of several technologies such as the availability of digital communication through hand held devices, embedded operating software for processing information and digital connectivity through wireless networks which are essential requirements for mobile commerce applications to operate.
- **Security and Encryption**: In the mobile commerce environment, since the information is made available through the WAP gateway or through iMode, the information source

security depends upon the security provided by the appropriate gateway protocols. In case of WAP gateways, the Wireless Transport Layer Security (WTLS) implements the information source security to block unauthorized access and modification of information content.

- **Mobile Commerce Payment Systems:** It is a mechanism that facilitates an online financial exchange between concerned parties. In the expanded scenario of mobile commerce with geographically dispersed retail buyers and suppliers unknown to each other, mechanisms based upon limited number of well-known participants do not have flexibility to scale-up to the emerging electronic markets. Several scalable and flexible mobile payment mechanisms have emerged, which essentially imitate traditional payment mechanisms, such as cash, checks and credit cards.
- **Infrastructure, Legal framework and Network/Protocol Standards:** The emergence of wireless networks further enhanced the reach of online access and users were able to reach out to the global digital marketplace on internet, while on the move. As mobile telephony began to mature and acquire data transmission and reception capabilities, access to online information was no longer limited to the wireless Internet.
- **Mobile Commerce Revenue Streams:** With the growth in the number of mobile users with data access, several sources of revenue streams have become possible.
- **Mobile Commerce Applications:** As a result of the potential offered by revenue streams several prominent mobile commerce applications have been deployed.

5. What are the different application of M-Commerce?

Some of these applications are given below:

- **Mobile Advertising**: Advertising has become a major source of revenue for most of the portals through banners and other search specific targeted advertising capability. Mobile infrastructure and access has grown at a faster pace than the Internet and has created a huge market space for advertisements.
- **Mobile Auctions:** With the growth of eBay, OLX and Baazee, the popularity of auctions over the internet has already been proven. Mobile devices further increase the reach of electronic auction markets.
- **Mobile Entertainment:** Businesses using applications that offer entertainment services such as these on a pay-per-event, pay-per-download, or on subscription basis can cater to a vast number of users who carry mobile devices today and are willing to pay for such services.
- **Mobile Financial Services:** In addition to accessing banking services, stock market and other financial information from mobile devices, some applications have been developed to make the mobile device suitable for the payment purposes.
- **Location and Search Service:** The Internet increased the market access of customers by making it possible for them to search for a product, service or a person based upon the specifications and attributes that they are looking for.

6. Analyze the online payment system concept.

Online payment is fundamental to the acceptance of mobile commerce as a viable alternative. It is a mechanism that facilitates an online financial exchange between concerned parties. In the expanded scenario of mobile commerce with geographically dispersed retail buyers and suppliers unknown to each other, mechanisms based upon limited number of well-known participants do not have flexibility to scale-up to the emerging electronic markets.

Some of the factors that are essential of newer payment systems are:

- **Simplicity and Usability:** The availability of a wide range of goods and services,

geographical availability of the service and reliable and effective delivery of goods are other important factors that make a payment system usable and simple. The low barrier to learning and adoption of payment system and ease of use/ convenience to the consumer, personalization of the service makes it possible to integrate any system in to daily payment activities.

- **Universality:** A single integrated platform of payment service that can satisfy the need any systems in of person-to-person (P2P), business-to-consumer (B2C), and business-to-business (B2B) payments in geographically spread out markets that are domestic, regional and global.
- **Interoperability**: In any financial payment system, the user should be ensured of interoperability amongst the multiple payment systems, as the world is going to remain heterogeneous in nature and many modes of payments may remain in existence.
- **Security, Trust, and Privacy:** The trust can be build by technology-based assurance against fraud and other security issues. Unless, users are assured that the mobile payment system follows tried, tested and true secure banking practices, it is unlikely that users will adopt it.
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