BUSINESS PROCESS MANAGEMENT AND INFORMATION TECHNOLOGY

PROCESS:

Process is defined as a series of events which helps in conversion of input into the desired output.

BUSINESS PROCESS:

A series of events which are required for translating the strategies into the desired objective or outcome. Business process can be dealt in the following ways:

DEFINING THE PROCESS

Mapping down the location and roles which are to be achieved in near future.

PERFORMANCE MEASUREMENT

Measuring the efficiency and effectiveness of the strategies and ensuring the desired benefit from the same.

ORGANIZATIONAL SET-UP

The infrastructure of the organization and the framework which helps or contributes towards the attainment of the goals of the organization.

TRADITIONAL MANAGEMENT VS. PROCESS MANAGEMENT

Traditional Management	**Process Management**
Mainly comprises of department and functional managers.	It focuses on achieving the desired process and for which a process owner is appointed who shall be responsible for the growth and development of the process.
It focuses on cost leadership strategy mainly suited for price sensitive customers who are influenced or affected by the price of the product. Cost leadership means producing the goods and services at a minimum or lower cost in order to become a market leader	It focuses on differentiation strategy which means unique or distinctive feature of the product mainly suited for customers who are price insensitive.

BUSINESS PROCESS FLOW

A series of events which is used to depict the result of the same.

In case of accounting, business process flow can be bifurcated or divided as follows:

1. Occurrence of an event/transaction
2. Journal entries
3. Ledger
4. Trial balance
5. Adjustments
6. Post adjusted trial balance
7. Closing entries
8. Financial statement effect

In case of sales:

1. Sales order
2. Check inventory
3. Shifting goods from warehouse
4. Delivery (transport)
5. Invoice
6. Receipt
7. Reconciliation

*Examiner will not ask you to write the example, you must write it yourself.

In case of purchase:

1. Purchase department approval (level of requirement)
2. Vendors are to be requested for quotations
3. Approval of quotations on the basis of price
4. Invoice is issued
5. Payment

BUSINESS PROCESS MANAGEMENT (BPM)

Means the process through which overall management takes into account fulfilment of series of transactions. Handling the same and also ensuring balance of the same in order to ensure efficiency and effectiveness.

It can be bifurcated as:

STRATEGY

It is framed at the higher level of management and the lower level of management has to implement the same.

GOALS

It is divided into:

OPERATIONAL GOALS

It takes into account fulfilling the operation of day-to-day nature or routine nature.

ORGANIZATIONAL GOALS

Considers major attainment of goals and objectives which has a wider coverage as compared to operational goals.

PRINCIPLES OF BPM

BPM Principles can be elaborated as below:

- Processes are assets to the organization which provides benefits.
- Processes are helpful in providing value to customers.
- A continuous effort towards the improvement of the process is essential.

PRACTICES OF BPM

PROCESS ORIENTED ARCHITECTURE

The framework of the business is divided into process. Division of the same helps in better achievement of numerous tasks which are interlinked with each other.

APPOINTMENT OF PROCESS OWNER

Process owner shall be responsible for growth, development, improvement, efficiency of the process and its functioning.

LEVEL OF HIERARCHY, ITS COMMITMENT AND EXECUTION

Policies are framed at the highest level or top-level management. Execution of the same is done at the lower level of management and hence a balance between both is essential.

USE OF INFORMATION TECHNOLOGY

Usage of internet-based technology and other development in the field of IT is to be used for the benefit of the organization.

COLLABORATION WITH OUTSIDE PARTNERS

Organization must have a constant collaboration with outside partners which means outsourcing. Time and monetary elements involved are to be examined and a choice of the same i.e. whether in-house production or outsourcing, which would be beneficial.

CONTINUOUS IMPROVEMENT AND LEARNING

With the advancement of technology and development, coping up with the same and adopting the same to continuous learning and improvement is essential so as to remain competitive and ahead of the competitors.

RISK AND REWARD TO THE EMPLOYEES

If the organization focusses on linking the reward with the risk incurred by the employee so that he would better perform and provide better output to the organization.

Organizational goals would become the goal of the employee.

OTHER TOOLS

Quality-oriented, development of new products or improvising existing products also helps in facilitating BPM.

BPM LIFE CYCLE

Business process management life cycle has following phases:

1. ANALYSIS PHASE

Scanning the environment and identifying the need for business process management.

2. DESIGN PHASE

On the basis of analysis and data obtained, designing of a plan is to be made.

3. IMPLEMENTATION PHASE

Merely designing would not be beneficial until and unless proper implementation of the same is taken into account.

4. RUN AND MONITOR PHASE

Over the period of time, strategies framed is to be continuously monitored and tracked.

5. OPTIMIZATION PHASE

Corrective action, if any, is to be taken and the life cycle process is to be repeated.

THEORIES OF BPM

SIX SIGMA

Six sigma ensures better process output and also ensures that the process management provides adequate results. Main focus of six sigma is on identifying the defects and removing the same. It takes into account production of cycle time, increased profitability, and increased customer satisfaction. It is bifurcated or divided into life cycle i.e.

D: **D**efine

Defining the customer, their needs, and requirements as well as preference.

M: **M**easure

Collecting data based on current situation and taking steps to satisfy the needs of customers.

A: **A**nalyse

Using of tools, techniques, and methods in order to obtain solutions to the problems.

I: **I**mprove

Over the period of time, making improvements and taking corrective action.

C: **C**ontrol

Ensuring repeated cycle movement and repeating the process so that control can be assured.

NEED FOR BPM IMPLEMENTATION

1. Long term future benefit
2. Short term cost efficiency
3. Reduction in barriers
4. Improved productivity
5. Leadership and role for implementing BPM

TQM: TOTAL QUALITY MANAGEMENT

It focusses on overall quality management. It requires commitment and collaboration from all over the organization. Quality refers to as distinctive, differentiative element which the competitor is unable to provide. TQM is no more restricted only to manufacturing concern, but it also has implications over service sector. TQM can be divided into following life cycle:

P: PLAN

Plan means identifying the present situation and diagnosing the problems which are to be resolved.

D: DO

Obtaining solution to the problem and focussing on providing adequate results.

C: CONTROL

Making a comparison of before and after data.

A: ACT

Recommendation, suggestion, report which are required or beneficial for further repeating of life cycle.

BPR: BUSINESS PROCESS RE-ENGINEERING

BPR means keeping aside the old practices and making a fresh start i.e. starting all over, starting from scratch. BPR focusses on **drastic achievement** which means not incremental improvement which results into 5 or 10% improved quality or output, rather it focusses on 80 or 90% improved benefit.

It also takes into account **radical redesign** process i.e. going into the root cause of the problem and obtaining solution of the same. It does not make artificial changes.

It also takes into account **fundamental rethinking** that what is being done, why it is being done and the result of the same.

SUCCESS FACTOR

ORGANIZATION WIDE COMMITMENT

Commitment and collaboration from overall management is essential for the success and efficiency of BPR.

NEED FOR BPR

Identifying the need and requirement for BPR, reasons for making changes and putting emphasis on the change process.

ORGANIZATION IT STRUCTURE

IT structure comprises of hardware, software, network facilities which are essential for implementing BPR.

ORGANIZATIONAL CHANGE

Change or requirement for the same has to be analysed and based on such requirement BPR is to be implemented.

CONTINUOUS IMPROVEMENT

Ongoing and repeated improvement of the process would ensure better efficiency and result.

INFORMATION SYSTEMS AND IT FUNDAMENTALS

BUSINESS PROCESS AUTOMATION (BPA)

BPA focusses on making maximum utilization of resources available and ensuring reduction in operational cost in order to increase profitability.

BENEFITS

1. Saving in operational cost
2. Getting ahead of competitors
3. Increased productivity/profitability

RISK INVOLVED

1. Affects the job role of individual.
2. Automation of poor processes will not gain better business practices.

VALUE CHAIN ANALYSIS

Factors affecting within the organization which provide value to customers are to be taken into account. Value chain can be bifurcated into two activities -

PRIMARY ACTIVITY

1. Inbound logistics
2. Operation
3. Outbound logistics
4. Marketing and sales
5. Services

SUPPLEMENTARY ACTIVITY

1. Procurement
2. Technology
3. HR
4. Infrastructure

FUNCTIONS

1. Research and development
2. Design of the product
3. Productivity
4. Marketing and sales
5. Distribution
6. Services

ACCOUNTING INFORMATION SYSTEM (AIS)

Accounting Information System is mainly beneficial for accountants and auditors. However, in the outside world, it is beneficial for investors, creditors, governments. Accountants and auditors require accounting information for recording

the data and also expressing an opinion over the same. For the purpose of accounting information system, following elements are to be considered:

COLLECTION AND STORING OF DATA

Data are collected on the basis of events taking place and at the same time, storing the same is essential.

RECORDING THE TRANSACTION

Data are posted into the journal in a chronological order which is helpful or beneficial for the purpose of gaining an idea about the sequence of events taking place.

SAFEGUARDING THE ASSETS

Assets can be safeguarded by proper documentation and also delegation of authority and responsibility. Appropriate persons are appointed who shall look into proper documentation and safeguard of the same.

REASONS FOR FAILURE OF BUSINESS PROCESS MANAGEMENT SYSTEM (BPMS)

1. Resources not available when required
2. System failure at the time of need
3. Technology obsolescence
4. Gap analysis
5. Inefficient/deficient project management
6. Deficient executive involvement
7. Inability to identify future business needs

REQUIREMENT FOR DOCUMENTATION

DESIGNING ON HOW SYSTEM OPERATES

Documentation is beneficial on designing with regard to the operation of the system and the steps involved over the system.

TRAINING USER

Manual, user guide helps in providing an idea about the usage of the system wherein documentation can be related to follow the steps for the operation.

DEVELOPING OF NEW SYSTEM

Previously the system which has been developed, deficiency if any cannot be repeated for the new system and documentation can be relied for the development of the new system.

CONTROLLING ADMINISTRATIVE AND MAINTENANCE COST

ACCOUNTING INFORMATION SYSTEM

DOCUMENTATION OF BUSINESS PROCESS

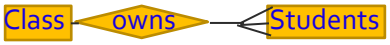
ENTITY RELATIONSHIP DIAGRAM

It is a graphical representation of entities. Entity refers to a physical object. Entity is represented in the form of a Relationship of entities is depicted in the form of a

TYPES OF RELATIONSHIP

ONE TO ONE RELATIONSHIP

ONE TO MANY RELATIONSHIP



MANY TO ONE RELATIONSHIP

MANY TO MANY RELATIONSHIP

ADVANTAGES OF ER DIAGRAM

1. Simple and easy to understand
2. Generalized and can be used as per the requirement
3. Beneficial for designing database

DISADVANTAGES OF ER DIAGRAM

1. Complex and inconsistency
2. Misinterpretation

DATA FLOW DIAGRAM (DFD)

Data flow diagram is a graphical representation of flow of data.

LOGICAL DATA FLOW

Focuses on business, its operation and working

PHYSICAL DATA FLOW

How the system would be implemented

FLOWCHART

[OV=Order Value (Screenshot)]

Flowchart is used for graphical representation. Usage of symbols helps in analysing the relationship.

TYPES OF FLOWCHARTS

DOCUMENT FLOWCHART

Focuses on physical flow of data i.e. person or department involved for the formation of the same

SYSTEM FLOWCHART

Electronic flow of data is considered

PROGRAM FLOWCHART

Logical operations are to be dealt in program flowchart.

SYMBOLS USED IN PRESENTATION/PREPARATION OF FLOWCHART

Start/Stop 

Input 

Last record/Alternative/Options 

Outcome/Output 

Print 

Q.: A company offers following discount to customers on the basis of order value. Discount details are given as below:

ORDER VALUE	DISCOUNT DETAILS
0-99	10%
100-199	20%
199-299	30%

Computer will read input as Order Value. You are required to print the details of discount.

[Make and attach flowchart here from screenshot]

ADVANTAGES OF FLOWCHART

1. Easy and simple to understand
2. Helps in communication
3. Facilitates documentation
4. Effective analysis
5. Helps in establishing identity or relationship

DISADVANTAGES OF FLOWCHART

1. Complex logic
2. Not suitable in case of modification
3. Not used in reproduction

4. Cannot be easily converted into programming language or written in English

DECISION TREE

Apart from being a graphical representation, decisions are reflected in a tree pattern. Number of alternatives emerging from the roots and various possible outcomes available.

ADVANTAGES

1. Various possible outcomes
2. Numerous alternatives, better efficiency

DISADVANTAGES

1. Complexity due to variables involved

DECISION TABLE

Decision table accompanies the flowchart. It comprises of conditions i.e. various possible options available as well as actions i.e. the outcome or result. Condition entries and action entries are represented to determine the various possible permutations and the solution to the problem.

ADVANTAGES

1. Compact form of documentation
2. Simplicity
3. Non-technical user can also use the same

DISADVANTAGES

1. As compared to flowchart, it is much more difficult to understand
2. Various possible permutations available often makes it complex

[Make and attach decision table here from screenshot] [BPM Lecture 3 Video 3]

TELECOMMUNICATION AND NETWORK

Network has an influential role in order to provide connectivity, not only between employees but also between colleagues and other work atmosphere aspects. Slowly and gradually, with the change in the environment, information technology has taken a great pace of growth and the advantage of the same over the organization is to be considered.

ADVANTAGES OF COMPUTER NETWORK

FILE SHARING

It helps the recipient to share the file as per their requirement with the help of network.

RESOURCE SHARING

Resources in the form of hard disk, printer can be shared by numerous users. Extra cost for installation of the same is not required to be incurred.

DATABASE SHARING

Networking also facilitates sharing of data base between the users.

FALSE TOLERANCE

With the help of networking, various security aspects are considered. Apart from backup, steps are taken for the storage of data in case of power failure.

INTERNET ACCESS AND SECURITY

Networking also facilitates usage of internet and various advantages associated with it. At the same time, security aspect is also to be taken into account.

TELECOMMUNICATION NETWORK

Telecommunication network can be categorized as below:

TERMINALS

Starting and stopping points of telecommunication network environment. Input and output which are used are referred to as terminal components.

TELECOMMUNICATION PROCESSOR

NETWORK INTERFACE CARD

Network Interface Card is a computer hardware network that connects computer to computer network. It has additional memory to handle the incoming and outgoing data transmission.

MODULATOR AND DEMODULATOR

Modulator converts digital telephone signal into analog telephone signal. However, demodulator converts analog into digital.

MULTIPLEXOR

A single communication channel that helps in various data transmitted from various terminals.

SWITCH

Switch is a communication processor that connects **telecommunication circuit** which helps in transmitting telecommunication messages to its destination.

ROUTER

It is a communication processor that interconnects network based on different protocol or rules.

HUB

It is a port switching communication processor that helps in sharing of resources such as server, printer.

BRIDGE

It is a communication processor that connects various LAN.

REPEATER

It is a communication processor that boosts or amplifies signal problem before transmitting it to other section.

GATEWAY

It is a communication processor that connects network based on different communication architecture.

TELECOMMUNICATION MEDIUM OR CHANNEL

It can be bifurcated into:

GUIDED MEDIA/BOUND MEDIA

TWISTED PAIR/TWISTED CABLE

It mainly comprises of a copper wire used in the home or office telephone suitable for both data and voice transmission.

COAXIAL CABLE

Comprises of copper or aluminium wire. Better frequency and faster service as compared to twisted pair. However, installation costs and maintenance costs are high

FIBRE OPTIC

It comprises of hair-thin glass framework which is coated with a protective jacket. Conversion is made in light form and it is busted through laser. Very high frequency and efficiency as compared to others. At the same time, cost is significantly high for installation of the same.

Guided media or bound media uses cabling system for telecommunication processing.

UNGUIDED MEDIA/UNBOUND MEDIA

It does not use the cabling system for transmission.

- Micro wave
- Radio wave
- Infrared

COMPUTER

Usage of computer is also made for the telecommunication network.

TELECOMMUNICATION SOFTWARE MANAGEMENT

Maintaining and taking into account software management system so that there is no loophole in the connectivity.

CLASSIFICATION OF TELECOMMUNICATION NETWORK

ON THE BASIS OF AREA

LOCAL AREA NETWORK

LAN is a telecommunication network which covers a limited area such as offices, classrooms, building.

BENEFITS/ADVANTAGES

- Security
- Expanded PC usage
- Electronic mail and broadcasting
- Organizational benefit
- Data base benefit
- Limited cost of upgradation and installation

METROPOLITAN AREA NETWORK

It is a telecommunication network lying between LAN and WAN. It is beneficial for both data and voice transmission e.g.: Cable Television System.

WIDE AREA NETWORK

The coverage is larger as compared to other network systems. It has a wide geographical coverage e.g.: Satellite Transmission, Long-Distance Telephone, Airline Reservation System.

ON THE BASIS OF FUNCTION

CLIENT SERVER TECHNOLOGY

One most powerful computer known as the server is connected to many less powerful computers known as the client or user. Client can be divided or bifurcated as:

FAT/THICK CLIENT

The whole processing is done by itself. It does not rely only on the server. All the internal processing is being done by itself.

THIN CLIENT

It relies upon the server for the processing.

HYBRID CLIENT

It is a combination of fat and thin client i.e. processing is being done. However, usage of the server is also required.

ADVANTAGES OF CLIENT SERVER TECHNOLOGY

1. A service provider and service receiver
2. Sharing of resources
3. Transparency
4. Adding or removing client is beneficial or easily handled
5. Limited cost element involved

DISADVANTAGES

1. If there is a server failure, computer connected with it fails to operate
2. Numerous clients are using the server which may be time consuming

PIER TO PIER NETWORK

In P2P, all computers are connected together, operate independently to share the resources and database. There is no client server system.

ADVANTAGES

1. It is a simple communication network
2. Cost effective phenomenon
3. Even if a computer fails, other computers would operate

DISADVANTAGES

1. If the computers are not connected properly, it would affect the working
2. Security is a matter of concern

MULTI TIER ARCHITECTURE

SINGLE-TIER

ADVANTAGE:

Mainly suited for proprietary concern. Only one computer is required. All the database is stored in the computer. Cost is relatively very low.

DISADVANTAGE:

Only one user at a time can operate.

TWO-TIER

Bifurcated or divided into client server framework. Database is bifurcated, but if numerous clients are connected, there would be a connectivity problem.

THREE-TIER/N-TIER

It is divided into layers:

Presentation Layer**:**

All the information is presented or displayed in the presentation layer.

Application Layer:

Information required as per the user can be pooled out from the presentation layer.

Data Layer:

Information is warehoused and stored in this layer. At the time of requirement, it can be utilized.

ADVANTAGE:

1. Clear separation of layers
2. Change management

DISADVANTAGE:

1. Complex and immature

ON THE BASIS OF OWNERSHIP

PUBLIC NETWORK

A network facility which is not owned by a single organisation. Many users can make use of the same like internet.

PRIVATE NETWORK

Network facility which is owned by an individual organisation which may be either government, agency, other business organisation. Users are only limited to such concern.

VIRTUAL PRIVATE NETWORK

Before the prevalence of private network, company used to lease line from telephone companies. VPN is a combination of public and private network wherein benefit of public network such as internet can be taken. On the other hand, organisational safety such as protection that is a feature of private network can be taken advantage of.

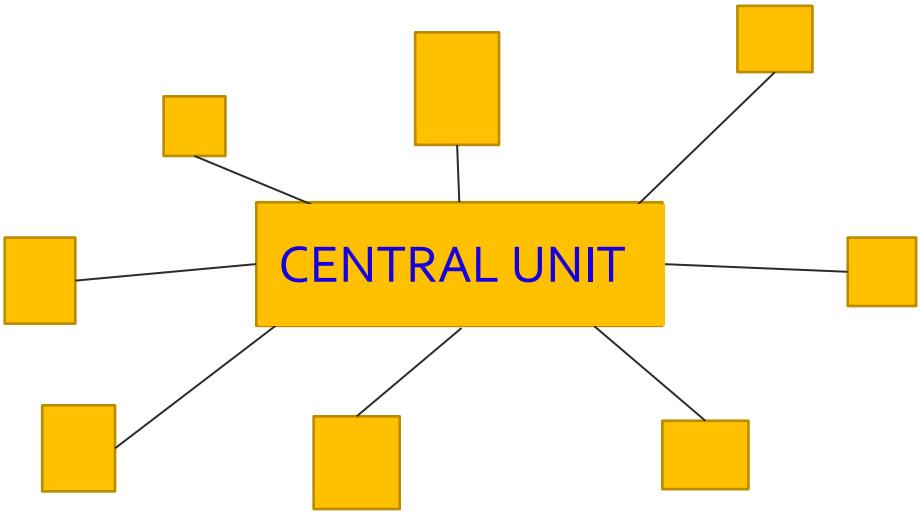
TOPOLOGY

Topology means physical or logical arrangement of link in a network

Whereas geometrical arrangement of relationship of link and other linking devices is usually known as node.

Various topologies which are used for LAN and WAN can be categorised as below:

STAR NETWORK



Star network is a centralised system which helps in networking.

All the nodes are connected with a central hub or central unit.

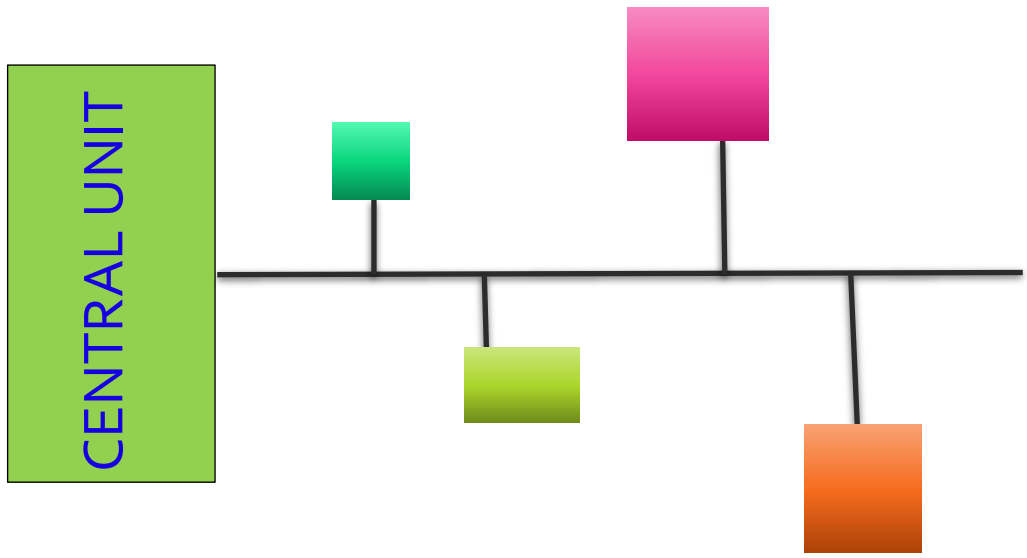
ADVANTAGES

- Various or several users can use the central unit at a time.
- Adding or removing of nodes is quite easy
- A node failure will not affect the working of the entire network

DISADVANTAGES

- If the main unit or central unit stops working, it would affect the whole network.
- It also becomes less reliable because all the nodes are dependent upon the central unit
- Cost of cabling is also high

BUS NETWORK



A single wire is used for the purpose of connectivity or linking all the

All the communication taking place through this cable is known as bus, it has a decentralised approach.

ADVANTAGES

- It is not dependent upon a central hub or central unit
- Failure of one of the computers will not affect the entire network
- Less cost of cabling
- Easily extendable
- Repeater can be used

DISADVANTAGES

- Networking problem due to heavy network traffic
- Weak electrical signal

RING NETWORK

[Diagram]

It has a decentralised approach. When one computer needs data from another computer, it is easily passed on along the ring

ADVANTAGE

- No central hub is required
- It offers high performance
- It is easily extendable and suitable for long distance as compared to other networks

DISADVANTAGES

- Failure of one computer would affect the entire network
- Adding or removing of computer would hamper the network
- It is expensive and difficult to install

MESH NETWORK

In a high alert area or zone where high networking is essential usually in case of military operation, mesh network is used in such cases.

ADVANTAGES

Quick diagnosis of the problem in mesh network is possible.

DISADVANTAGES

High cost of installation and maintenance

TRANSMISSION OF DATA

Data transmission techniques can be classified as below:

SERIAL TRANSMISSION	PARALLEL TRANSMISSION
Data transmitted one by one	Data is transmitted simultaneously or parallelly
Usage of single wire for transmission	Usage of multiple wires, usually 8 different wires
It is a cheap mode of transfer of data	Expensive mode of transfer of data
It is a slow mode of transfer of data	It transfers data relatively faster
It is useful for long distance transmission	It is not suitable for long distance transmission

ASYNCHRONOUS TRANSMISSION	SYNCHRONOUS TRANSMISSION
Each data is transmitted through Start & Stop bit	No Start or Stop is used for transmission of data
Speed is relatively slow	Speed is faster
It is cheaper as compared to synchronous	It is more expensive
More reliable	Less reliable
Less efficient	More efficient

TRANSMISSION MODES

SIMPLEX

Data is transmitted only in one direction i.e. uni-directional e.g.: keyboard for feeding input, printer for receiving output.

HALF DUPLEX

Bi-direction transmission of data only at one time e.g.: walkie-talkie.

FULL DUPLEX

Data is transmitted to and fro at the same time e.g.: mobile phone.

FRAMEWORK INVOLVED IN TRANSMISSION TECHNIQUE

CIRCUIT SWITCHING

Circuit switching is used for the purpose of transmission of data. Usually a single circuit is used during the entire duration as usually seen in the home telephones.

It is divided into 3 phases:

1. Establishing a circuit
2. Transfer of data
3. Disconnecting the circuit

PACKET SWITCHING

Messages are divided into small transmission known as packets before they are sent. Each packet is sent individually. There is no fixed path. Packages are transmitted through different directions in order to reach their destination.

MESSAGE SWITCHING

Messages are transmitted from stores

Transmission takes place in a store and forward form i.e. whenever the servers are available, message transmission takes place. It is a very reliable service e.g.: email and voice mail.

PROTOCOL

Protocol is referred to as set of rules which are required for data transmission between computers. It is also a set of rules for inter-computer communication that has been agreed upon and implemented by vendors.

Protocol focusses on:

SYNTAX

Format of data which is being exchanged

SEMANTIC

Type and order of messages in order to ensure reliable and error-free transfer

TIMING

Timing would ensure data rate selection and correct timing for various events during data transfer

OPEN SYSTEM INTERCONNECTION(OSI) MODEL

OSI model has been developed to serve as a standard model for network architecture. It is divided into 7 layers:

LAYER 7: APPLICATION LAYER

It is closest to the user i.e. both application layer and the user interact directly. It provides services to the user such as file sharing and file transfer.

LAYER 6: PRESENTATION LAYER

It is also known as syntax layer which converts incoming and outgoing data from one presentation format to another e.g.: a window pop-up gives an idea of a newly arrived text.

LAYER 5: SESSION LAYER

It takes into account operations of simplex, half duplex, full duplex. It coordinates and terminates conversation, exchanges, applications between each other.

LAYER 4: TRANSPORT LAYER

It ensures reliable and transparent transfer of data between user processes. It keeps a record of data transmitted and retransmits those that have failed.

LAYER 3: NETWORK LAYER

Network layer ensures length of data and volume of data transmitted from the source to destination. It also maintains the quality of services provided.

LAYER 2: DATA LINK LAYER

It acts as a linkage between network layer and physical layer. It responds to the request from the network layer and issues service request to the physical layer.

LAYER 1: PHYSICAL LAYER

It is a hardware layer which specifies mechanical features as well as electromagnetic features of connection between devices. It also provides establishing and termination of a connection and also comprises of pin, voltage, cable, repeater.

THREATS

Threat is a possible danger that can hamper or disrupt the operation, functioning, availability of a network system. It can be categorised as below:

UNSTRUCTURED THREAT

Inexperienced individual who obtains hacking tools available over the internet. This is mainly done out of curiosity rather than a deliberate intention in mind.

STRUCTURED THREAT

In structured threat, usually individuals who are highly professional and competent are appointed by competitor in order to cause damage or pose threat to the organisation. They are mainly referred as professional hackers.

EXTERNAL THREAT

It takes place from individual or organisation working outside an organisation who do not have access or authority to organisation's computer system or network.

INTERNAL THREAT

It emerges from individuals who have been authorised to access the network of the organisation.

VULNERABILITY

Vulnerability is an internal weakness or inherit weakness in the design or implementation of a network system and it is susceptible to threat.

SOFTWARE BUG

Very often it is seen that system crashes which may be due to failure to handle exceptional situation, excess validation error, input validation error. Users have developed technique for working around the consequences.

TRUSTING UNTRUSTWORTHY INFORMATION

In case routers are not programmed which is receiving information which may cause damage.

END USER OR PASSWORD ERROR

Users of computer system are not only professionals and not always security conscious e.g.: number of passwords increases, user starts to write them down and they are easy to be found.

LEVEL OF SECURITY

1. Preparation of a plan
2. Asset identification

3. Asset valuation
4. Threat identification
5. Threat probability
6. Exposure analysis
7. Control
8. Report

NETWORK SECURITY

CRYPTOGRAPHY

It is referred as practice and study of technique for secure communication. It considers or has a set of protocols which are helpful to overcome the influence of third party or adversaries. It is helpful for data security, confidentiality, integrity.

ENCRYPTION

Encryption can be referred as encoding of messages with a view so that is protected from attack by hackers. Similarly, decryption is referred as recovery of the original message.

PLAIN TEXT

It is referred as message which is to be encrypted.

CYPHER TEXT

It is the output which is emerging from the encryption process.

TYPES OF KEYS FOR ENCRYPTION AND DECRYPTION

SECRET KEY

Both the sender as well as receiver uses the same key. If the sender is using algorithm for encryption, receiver would decrypt the same by inversing the algorithm used for encryption.

PUBLIC KEY

A private key is used by the receiver and a public key is used by the public.

TYPES OF ENCRYPTION

HARDWARE ENCRYPTION

Mainly used for supporting high data traffic. It is available at reasonable cost for performing routine nature of data trafficking/transmission.

SOFTWARE ENCRYPTION

Costly as compared to hardware encryption. Mainly suited for specific application.

NETWORK SECURITY PROTOCOLS

SECURE SHELL (SSH)

It is a program to log into another computer over network to move files from one machine to another. It is based on a set of rules or protocol to ensure and protect the network from attacks.

SECURE FILE TRANSFER PROTOCOL (SFTP)

It is a used for accessing and managing files. It encrypts command and data both.

HYPER TEXT TRANSFER PROTOCOL (HTTP)

A set of network security protocol for secure communication over a computer network specially as the usage of internet.

SECURE SOCKET LAYER (SSL)

It considers security channel between two machines operating over the internet or an internal network.

INTRUSION DETECTION SYSTEM (IDS)

Intrusion detection system is a device or software application that monitors network or system activity for malicious activity. It can be bifurcated as:

NETWORK INTRUSION DETECTION (NID) SYSTEM

1. Mainly suited to detect unwanted events on the wire between hosts.
2. It is helpful for preventing attack from packet-based attack.
3. It is helpful in detecting outsider misuse.

HOST-BASED INTRUSION DETECTION (HID) SYSTEM

1. Mainly suited for preventing and detecting attack over the host.
2. It is suited for handling for detecting internal threat.

HYBRID

It is a combination of both NID and HID.

FIREWALL

It is a secure and open-system environment to ensure free connectivity and secure connectivity. Usually, connectivity through internet

SITE BLOCKING

It is also a system through which safety of the management can be handled. Various websites are blocked so that undue advantage cannot be taken and it is accessible only through authorised users.

INTERNET

It is a global computer network or information super highway. It is also referred as the backbone for world wide web.

BENEFITS OF INTERNET

1. Strategic Business Alliance
2. Providing Customer and Vendor Support
3. Collaborating with Business Partners
4. Buying and Selling of Products and Services
5. Attracting New Customers
6. Retaining Existing Customers-By providing or offering variety of products
7. Providing A Web-Based Market
8. Electronic Commerce

INTRANET

It is a company's private network which is accessible only to employees of that company. It is mainly used to distribute data/ information to employees.

BENEFITS OF INTRANET

BUSINESS VALUE OF INTRANET

Intranet is beneficial or helpful for providing organisational benefit as well as database sharing.

COMMUNICATION AND COLLABORATION

It can also improve communication and collaboration. It is helpful wherein sending or receiving of email or fax takes place within the organisation.

BUSINESS OPERATION AND MANAGEMENT

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EXTRANET

It is helpful in offering access to selected outsiders such as suppliers or customers. It is necessary for the purpose of exchange of data with outsiders and smooth flow of activities.

BENEFITS OF EXTRANET

- Sharing product catalogues
- Collaborating with other companies for joint effort
- Using training programme
- Sharing of news for common interest

FIVE RULES OF EXTRANET

- Be flexible as business
- Protect the interest of data owner
- Deploy in internet time
- Serve the partner as customer
- Drive information to decision maker

DIGITAL SUBSCRIBER LINE (DSL)

It is referred to as reuse of telephone line that connects to our house for digital data transmission. Computer is connected to a device called DSL Modem that helps in converting digital packets and analog signals.

CABLE MODEM TERMINATION SYSTEM (CMTS)

It is used for sending signals over the Cable TV system. The device which is used at the home is called cable modem and the device which is at the cable end is known as CMTS.

E-COMMERCE

E-commerce means doing business electronically. It is referred as using of technology in order or due to enhance commercial transactions between a company and its customers and business partners.

BENEFITS OF E-COMMERCE

- Reduction in cost to buyer
- Reduction in cost to supplier
- Reduction in overhead cost
- Reduction in advertising cost
- Reduction in inventory and risk for the same
- Reduction in error and time
- Increase or quick services for completing the business transaction
- Creation of new market
- Easier entry into new market

RISK INVOLVED IN E-COMMERCE

- Repudiation of contract
- Data loss
- Attack from hackers
- Denial of service
- Lack of audit trial
- Problem of piracy

TYPES OF E-COMMERCE

BUSINESS TO BUSINESS (B2B)

Exchange of services, information, product from one business to another e.g.: a spare part manufacturing organisation would be more benefitted over selling the product to a business organisation which is using the same for developing a product. Herein, exchange takes place between two businesses.

BUSINESS TO CONSUMER (B2C)

It is referred as exchange of services, information, product, from one business to another consumer as against sharing between business to business. It has various advantages like shopping can be faster, offering and price can change instantaneously.

CONSUMER TO BUSINESS (C2B)

Wherein consumer directly contacts business vendors by posting their project so that various company can review the same and quote their quotation.

CONSUMER TO CONSUMER (C2C)

Wherein directly a consumer interacts or exchanges goods and services with another consumer e.g.: barter system.

BUSINESS TO GOVERNMENT (B2G)

It is referred to as use of information to enhance and build relationship with the government and employees and other government agencies.

BUSINESS TO EMPLOYEE (B2E)

Wherein business offers online products and services to its employees.

MOBILE COMMERCE

M-Commerce means buying and selling of goods and services through wireless handheld device and portable such as telephone and Personal Digital Assistants (PDA).

Industries that are affected by M-Commerce include financial services (mobile banking), telecommunication services, service industry and information services.

ELECTRONIC FUND TRANSFER (EFT)

EFT means the way through which business can receive directly the payment from financial institution to company's bank account. It is fast, safe, convenient mode.

Examples of EFT:

AUTOMATED TELLER MACHINE (ATM)

Usually a personal identification number (pin) is generated and the individual can do the transaction without a teller. In order to make deposit, transfer fund, from one account to another.

POINT OF SALE TRANSACTIONS (POS)

Usually in case of shopping, fund is transferred directly from customer account to the shopkeeper account. There is no requirement to carry cheque or cash.

PRE-AUTHORISED TRANSFER

When the account holder authorises bank or third party wherein consumer may ask for bill payment, insurance premium payment, electronic deposit of wages.

TELEPHONIC TRANSFER

Transfer of funds takes place from one account to another through telephonic instructions e.g.: payment of specific bills by phone.

BUSINESS INFORMATION SYSTEM

Data	Information
It is a collection of raw facts from various resources.	Conversion of data into a meaningful term is known as information.
It is unorganized.	Organized.
Unsorted.	Sorted.
Voluminous in nature. Comprises of numbers, text, images.	Non-voluminous in nature i.e. classified as per the requirement.
Non-precise in nature.	Precise in nature.

INFORMATION SYSTEM

A set of techniques or methodology for conversion of data into information is referred as information system. It can be classified as component-wise. Various components of information system:

PEOPLE

It comprises of system analyst, system operator, software developer as well as end user.

HARDWARE

Comprises of machine and media.

Machine relates to system, monitor, printer, scanner.

Media relates to floppy disk, [plastic card, paper form???]

SOFTWARE

Comprises of procedure and programme which may be operating system programme, spreadsheet programme, word-processing programme.

DATA

Data may relate to either inventory management, employee management, compensation, or payroll management.

NETWORK

Network relates to communication channels, communication media, network access.

TYPES OF INFORMATION SYSTEM

STRATEGIC LEVEL SYSTEM

It mainly considers long range planning. Various external factors prevailing in the external environment such as pricing pattern, market trend, industry trend, share prices, balancing the same with internal environment.

Strategic level system is mainly used by top level managers which may be CEO, CFO, other managers who are in the top most hierarchy. They are not responsible for day-to-day management or transactions but are mainly concerned about policy framing e.g.: 5-year policy making.

MANAGEMENT LEVEL SYSTEM

It mainly comprises of middle level managers who are responsible for implementing the policy and guidelines framed by the top-level managers. It comprises of regional manager or general manager. They mainly deal with what if situation e.g.: preparation of annual budget.

KNOWLEDGE LEVEL SYSTEM

Mainly comprises of knowledge and data worker who are distinct from non-knowledge worker. Knowledge workers are specialised in their skill and talent. They can be considered as an asset to the organisation e.g.: managerial efficiency.

OPERATION LEVEL SYSTEM

It takes into account day-to-day or routine nature transactions. Mainly suited for operational managers who are concerned about daily operation activities e.g.: accounts receivable/payable, payroll management.

TRANSACTION PROCESSING SYSTEM

TPS means as and when transaction takes place, from such point up to the time of processing the same and the procedure utilised for the same e.g.: banking, airline, railway reservation system.

STEPS FOR TPS

DATA ENTRY

Transaction or events taking place has to be analysed from the source which is referred as point of sale. Transaction can be identified from Point of Sale (POS) transaction which is the source of event taking place.

TRANSACTION PROCESSING

Transaction has to be processed in the following way:

BATCH PROCESSING

Wherein transactions take place over a period of time in the form of batches.

ONLINE/REAL-TIME PROCESSING

Processing takes place as and when transaction occurs

DATA MAINTENANCE

Record of the data relating to the transaction is to be maintained for further future reference.

DOCUMENT AND REPORT GENERATION

Documenting the same and generating a report for the same transaction is also considered.

TRANSACTION PROCESSING QUALIFIERS

A transaction in order to qualify for the processing purpose has to go through an ACID Test.

A: ATOMICITY

Transaction must have been completed in full or not at all. In case fund is transferred from one account to another, debit and credit of the same must take place i.e. transaction is completed in full.

C: CONSISTENCY

If a set of rules is being framed for processing a transaction, then in such a case, transaction must consider or abide the rules of the same.

I: ISOLATION

A dual or simultaneous effect. In case of fund transfer, account cannot be credited before debiting the other account.

D: DURABILITY

The longevity or durable nature in a transaction must exist i.e. it must qualify for TPS transaction.

OFFICE AUTOMATION SYSTEM

OAS is a combination/amalgamation of hardware, computer, and software. For the purpose of handling and dealing with and with an object to improve organisational efficiency and effectiveness. Apart from managerial activities, meetings, discussions and other performance of activities, OAS focusses on uses of computer and software for providing additional benefits to the organisation such as office-based application, electronic mail, voice mail, video conferencing, imatronic calendar, fax, work publishing.

KNOWLEDGE MANAGEMENT SYSTEM

The process through which organisation manages the knowledge which is essential for decision making purpose. Knowledge can be bifurcated as:

EXPLICIT KNOWLEDGE

Knowledge which is available through written words, spoken words and which is readily available. Not much effort or analytical skill is involved.

TACIT KNOWLEDGE

Knowledge which is based on experience/assumption of future unforeseen circumstances. It mainly emerges from experienced employee. Analytical, creative, innovative skill is involved.

MANAGEMENT INFORMATION SYSTEM

Management means managing men tactfully for the purpose of carrying out operations.

Information means conversion of data into meaningful terms.

System – A set of inter-related activities.

MIS is beneficial or helpful to support operation, decision making in an organisation. E.g.: Railway reservation, airline reservation, banking operation.

DECISION SUPPORT SYSTEM

DSS is mainly used by the managers to facilitate decision making. It serves the management, operation, and planning levels of an organisation.

COMPONENTS OF DSS

USER

Mainly manager uses decision support system for a solution to unstructured or semi-structured problem.

DATABASE

One or more database from both internal and external sources which may be either routine nature or non-routine nature.

MODEL BASE

As CPU is considered as heart and brain of computer, similarly model base is considered as heart and brain of DSS. It performs logical operations, data manipulation and computation.

DSS comprises of two types of planning language:

GENERAL PURPOSE

It performs routine tasks i.e. retrieving data from database. It helps the user in various problem, solution such as budgeting and forecasting.

SPECIAL PURPOSE

Limited number of tasks are involved. However, certain tasks or jobs are better performed than general purpose planning language.

USES OF DSS

- Handling 'what if' situation
- Manipulating data directly
- Managing data from external sources

EXECUTIVE INFORMATION SYSTEM

Mainly used by executive to access and administer data for decision-making purpose. It is different from DSS and MIS where managers used information system but, in this case, executive uses the system for decision-making purpose.

COMPONENTS OF EIS

HARDWARE

It includes input device, storage device and output device.

SOFTWARE

Based on the type of requirement which may be related to graphic, text-based software, time series chart, map, graphics, other comparison chart.

USER INTERFACE

Both hardware and software components through user interacts with the machine such as reports, question answers, input output.

TELECOMMUNICATION

Secure and reliable networking system through which data is transmitted from one place to another.

ENTERPRISE RESOURCE PLANNING

ERP takes into account both integrated external and internal management. It involves employing of innovative information system and technology in all the areas of company. It has a wider scope and coverage as compared to other system. ERP can be bifurcated or divided into the following stages.

STAGES FOR IMPLEMENTATION

STAGE 1 – INVENTORY CONTROL

It ensures supply and storage of items which should not be excess, neither it should fall short. It is an internal control to ensure adequate supply of material.

STAGE 2 – ABC ANALYSIS

It takes into account the technique of material control wherein material is divided into 3 categories and investment over the same is analysed.

A-ITEM

It comprises of highest consumption value.

B-ITEM

Average or medium level of consumption value

C-ITEM

Lowest level of consumption value

STAGE 3 – EOQ ITEMS

EOQ helps or benefits in uninterrupted inventory system. It helps in providing a suitable re-order point in order to make sure frequent replacement without any kind of shortage.

STAGE 4 – JUST IN TIME (JIT)

JIT ensures continuous improvement by identifying the defect and removing the same with a view to reduce cost, improve performance.

STAGE 5 – MATERIAL REQUIREMENT PLANNING

It takes into account planning the material level for production and also ensures products are available to deliver to customers.

STAGE 6 – MANUFACTURING RESOURCE PLANNING

After manufacturing activities and after production-related process is to be considered.

STAGE 7 – DISTRIBUTION RESOURCE PLANNING

It takes into account transporting activities, ensuring that customers can obtain the product at various locations through various distribution channels at the time of requirement.

STAGE 8 – ENTERPRISE RESOURCE PLANNING

ERP ensures after obtaining customer, order a roadmap through which dis-similar stages are to be handled.

STAGE 9 – MONEY RESOURCE PLANNING

Emphasis or stress is laid down over surplus money and planning to deal with the same.

STAGE 10 – EIS WEB-ENABLED

A web-based service or software which is easily and readily available for reviewing or revisiting existing IT structure.

CUSTOMER RELATIONSHIP MANAGEMENT

It is a business process wherein client relationship, customer loyalty and brand value are built.

Customer is the king. His requirement, taste and preference, usage is to be identified, whether it relates to either long-run or short-term benefit in nature.

CRM equation can be categorised as customer understanding + relationship management.

Satisfied customers would be helpful in bringing and attracting new customers. Customer is the source of company's profit and future growth. CRM provides ability to distinguish and manage customers.

Relationship with the customer is a continuous bi-directional communication and managing the same is not only an activity of managing department, rather it is a continuous change in the corporate culture and process.

GREENBERG'S DEFINITION OF CRM

BENEFITS OF CRM

1. Customer loyalty
2. Improved relationships
3. Long-term benefit
4. Ability to attract new customer
5. Increased productivity and higher growth

SUPPLY CHAIN MANAGEMENT (SCM)

Supply chain management takes into account integrating and managing the process of planning, implementing, and controlling the operations of supply chain. It takes into account all the movement and storage of materials from the point of origin up to the point of consumption. It ensures maintaining relationship with supplier, customer, and distribution channel.

COMPONENTS OF SCM

PROCUREMENT/PURCHASING

Requirement of materials from suppliers in order to ensure correct quantity is delivered at right time, right place, and right cost. Analysing the suppliers and choosing the one which provides the maximum benefit.

OPERATION

It leads into transformation of input into output. Transformation must be made in an efficient manner for the benefit of SCM.

DISTRIBUTION

Finally, distribution involves activities such as transporting, warehousing, customer relationship management.

INTEGRATION

Integration involves taking into account that all the participants in the chain provide desired services so that benefit can be derived otherwise it would lead to increased cost.

HUMAN RESOURCE MANAGEMENT SYSTEM (HRMS)

Human resource manager has an influential role for performing various functions from the point of recruiting up to the time of retaining the services of employee.

FEATURES

- Workforce management
- Time and attendance management
- Payroll management
- Compensation management
- Training management
- Recruitment management
- Organisational management

- Employee self-service

CORE BANKING SYSTEM

Core banking system ensures centralised banking system whereas core stands Centralised Online Real-time Environment. Core banking system provides numerous services which are centralised. Various elements of core banking system would include:

1. Making and servicing of loans
2. Opening new account
3. Cash withdrawal and deposit
4. Processing of cheque
5. Interest rate
6. Establishing interest rate
7. Customer relationship management

The benefits or merger of communication technology and information technology in order to suit the or facilitate the banking needs and requirement is known as Core Banking Solution (CBS).

EXAMPLE OF CORE BANKING PRODUCT:

INFOSYS FINACLE

Major services offered by the banks are represented in building block form. With the help of this, right items/services are offered to the customers as per their needs and requirements. Following are the key elements:

1. Enterprise customer information
2. Consumer banking
3. Corporate banking
4. Trade finance
5. Wealth management
6. Payment benefits/facilities

NUCLEUS FINNONE

This software was marketed and made by Indian company known as nucleus software. It takes into account global web banking. Factors such as loan origination, managing the type of loans and processing the same, credit card application system at the same time fraud and error associated is also managed.

ORACLE'S FLEXCUBE

This facilitates centralisation of various operations such as accounting, customer information, management information. It is helpful for better management and operational control. It improves risk management and reporting, self-service, various other benefits.

ACCOUNTING INFORMATION SYSTEM

Accounting information system is mainly used by the accountants, auditor, business consultants and analysts for decision making purpose. It is a system of collection, storage, processing of financial and accounting data which is used by decision makers.

COMPONENTS

PEOPLE

User mainly includes accountant, auditor, consultant, business analyst, different departments in order to help for decision making purpose

HARDWARE

It would include input and output device for operating the system

SOFTWARE

Computer programs that provide reliability and security based on the requirement of the manager.

DATA

It includes sales order, purchase request, register, inventory data, payroll information, etc. Which is used for decision making purpose.

POLICY PROCEDURE AND INSTRUCTION

It includes both manual as well as automated method for collecting, retrieving, and processing of data.

INTERNAL CONTROL

It would include security aspect such as password and other protection against attack from hacker, virus, external threat.

ARTIFICIAL INTELLIGENCE

It means the ability through which computer can discover, sketch, crack problems parallelly. Ensuring that computer behaves like a human being. Over the years, steps have been taken for such development but still a computer is not made that is as intelligent as human beings.

Commercial applications of AI

1. Decision making purpose
2. Information retrieval
3. Virtual reality
4. Robotic system

EXPERT SYSTEM

It is a computerised information system that allows non-expert to make decisions comparable with those of an expert. This system is mainly used for complex or ill-structured problems.

COMPONENTS OF EXPERT SYSTEM

KNOWLEDGE BASED

It includes data, knowledge, other tools which are used by the experts to solve a particular problem. Knowledge base can be categorised as realistic and uristic knowledge.

Realistic knowledge is generally available in the textbook or journal. However, uristic knowledge is based on practical aspect for decision making purpose.

INFERENCE ENGINE

It contains logic and reasoning mechanism. It uses the data obtained from both user and knowledge base in order to form conclusions.

USER INTERFACE

It allows the user to create, maintain, update, use the expert system.

EXPLANATION FACILITY

It explains the logic and reasoning which is used to derive the conclusion.

DATABASE OF FACT

Storage or repository of data i.e. the quality and quantity of data which is used by the user and would be helpful in decision making.

EXPERT SYSTEM CAN BE:

1. Example based
2. Rule based
3. Frame based

ACCESS CONTROL

ROLE BASED ACCESS CONTROL

Access or control over the system places the subjects into roll i.e. only the subject has the right and permission to those roles e.g. when an employee changes job, all previous access is removed and rights and permission of new role is assigned.

RULE BASED ACCESS CONTROL

It is context based e.g. a manager has the ability to improve his employee's hour work however when he himself approves his own hours worked, the rule differs or varies.

PAYMENT MECHANISM

CREDIT CARD

It is an online system of payment. The consumer presents his card to the merchant and a purchase slip is issued. Various steps are followed for processing of credit card.

1. AUTHORISATION:

   After the merchant swipes the card, data is submitted to merchant bank called acquirer requesting for same. The card is either allowed or denied.

2. BATCHING:

   At the end of the day, merchant reviews all the day sales, that they were authorised by the card holder then it transmits all the sale to received payment.

3. CLEARING:

   After the acquirer receives the batch, it sends it through the card network where the issuing bank deducts inter-change fees.

4. FUNDING:

   The final step in processing a credit card. Merchant is paid for the transaction and the card holder is billed.

FINANCIAL SERVICE TECHNOLOGY CORPORATION (FSTC)

Various banks and clearing houses have designed an electronic cheque which uses digital signature for signing and endorsing. It is a flexible mode of payment.

SMART CARD

It includes a microchip which contains all the information but offers the possibility of manipulating the data. It is of three types:

1. CONTACT CARD:

   Such card is needed to be inserted into a reader in order to work.

2. CONTACT LESS CARD:

   It is not required to be inserted into the reader. Just bringing it near a reader is sufficient e.g. card which is used for opening doors.

3. COMBI/HYBRID CARD:

   Contains features of both contact as well as contact-less card.

ELECTRONIC PURSES

It is another mode of payment over the net. It is like a prepaid card. Bank usually issues a stored value of card to its customer which can be used as an ATM card or debit card for making purchases. Validation is done through pin number. After the transaction is done, funds are deducted, if the amount is fully exhausted, consumer can load additional funds for the purpose of usage.

BUSINESS PROCESS AUTOMATION THROUGH APPLICATION SOFTWARE

BUSINESS APPLICATION

Business refers to a state of commercial activity or one's occupation or profession.

Whereas, application means computer program to fulfil a particular purpose.

Combining both of them would result into a computer program which would suit the requirement of the business to carry on more efficiently and effectively.

APPLICATION BASED ON NATURE OF PROCESSING

BATCH PROCESSING

Processing of data takes place at the end of a certain time period. All the data are collected and are processed at a later time period. It is mainly helpful or beneficial for producing bill, stock control, statement report or preparation or gathering of statement.

ONLINE PROCESSING

It is essential in online processing for user to input the data for processing. Data is processed immediately, it is mainly beneficial for online booking or reservation.

REAL TIME PROCESSING

Input is automatically acquired from censor and it is processed immediately. After processing the input, further censor would wait for the next set of input e.g.: alarm system or warning system.

APPLICATION BASED ON SOURCE OF APPLICATION

CUSTOM BUILT APPLICATION

Organisation as per their needs and requirements for the purpose of suitability would require an application which is beneficial for suiting its requirement and would satisfy the purpose of the organisation.

PACKAGED APPLICATION

These are not free application but are licensed which may or may not be customised.

LEASED

Herein application which is used, user has to pay fixed rental for using the application.

APPLICATION BASED ON SIZE OF ORGANISATION

SMALL AND MEDIUM

Based on the size of organisation, software can be opted which would suit the organisational needs like office management software, etc.

LARGE ORGANISATION

It is larger as compared to small organisation. Level of inventory, employee management, other application which would cater to the needs and requirement of the organisation shall be taken into account.

BUSINESS APPLICATION IN ORGANISATIONS

ACCOUNTING APPLICATION

As per the needs and requirements of accounting transactions, better financial statement preparation and presentation, these softwares have a huge influence such as tally.

OFFICE MANAGEMENT SOFTWARE

Based on the requirement of office management system such as MS Office, word, excel, PowerPoint, which is regularly required to suit the managerial requirement.

COMPLIANCE APPLICATION

Various rules, regulations and by-laws are to be complied. It is helpful for the purpose of e-filing of documents, e-payment of taxes, e-storage of data.

CUSTOMER RELATIONSHIP MANAGEMENT (CRM)

Software which would help in maintaining long lasting relationship with customer which may be either long run or short run in nature.

MANAGEMENT SUPPORT SOFTWARE

Such software facilitates for the purpose of decision making of the managers.

PRODUCT LIFE CYCLE MANAGEMENT SOFTWARE

It helps in classification of the product by diving the same into various stages i.e. introduction, growth, maturity, decline relating the same with time as well as sales.

LOGISTIC MANAGEMENT

Keeping the transportation cost as low as possible by maintaining contact and relationship with the distribution channel and transporter.

BUSINESS PROCESS AUTOMATION

It focusses on utilising maximum benefits of resources available for the benefit of the organisation and at the same time reducing the operational cost in order to generate greater profit.

OBJECTIVES OF BPA

1. CONFIDENTIALITY:

   Data is available only to the person who has the right to see the same.

2. INTEGRITY:

Unauthorised users are not permitted to have access to such data

3. AVAILABILITY:

Ensuring that right data is available whenever required

4. TIMELINESS:

Extracting or gathering data without much time taking

WHY BPA IS ESSENTIAL

1. Reduction in the impact of human error
2. Transforming data into information
3. Improving performance
4. Making the business more responsive, more competitive, cost saving as well as faster service to customer

STEPS/HOW TO GO ABOUT BPA

1. DEFINE WHY WE IMPLEMENT A BPA:

Firstly, an analysis about the existing system has to be made which may be resulting into a higher cost, error in manual processing, poor customer service and unable to respond to the request of customer which led to the requirement of implementing BPA.

2. REGULATION TO COMPLY BPA:

Rules regulations which are required to be complied by the law is to be considered for implementing BPA.

3. DOCUMENT THE PROCESS:

Documents which are used for implementing BPA need to be captured and the format of the same whether in paper form, fax or email form is to be maintained.

4. OBJECTIVES OR GOAL TO BE ACHIEVED FOR IMPLEMENTING BPA:

The objective of organisation is very essential in order to determine the BPA. Goal of the organisation should be SMART.

S- Specific

M- Measurable

A- Attainable

R- Relevant

T- Timely

5. BPA CONSULTANT

A consultant who would ensure to handle and manage the issues he must be experienced and having expertise and also is capable of recommending and implementing factors for BPA requirement.

6. RETURN ON INVESTMENT FOR PROJECT

Stakeholders are mainly concerned about the return on investment and hence BPA must ensure communication of the same to all the interested group of persons.

7. DEVELOPING BPA

After documenting and receiving the approval from top management, BPA is to be developed

8. TESTING OF BPA

The BPA steps which have been implemented is tested over a period of time so that any corrective action if required to be taken may be taken before any negative impact of the same takes place.

MANUAL INFORMATION PROCESSING CYCLE (MIPC)

The processing takes place manually and following steps are involved for the same:

INPUT:

Data is entered or fed in the register

PROCESSING:

Summarising the info. And working over the same

OUTPUT:

Report form is generated for the processing which has taken place

COMPUTERISED INFORMATION PROCESSING CYCLE (CIPC)

It is a computerised system which is used for transaction processing in the form of

INPUT:

Data is entered into the computer

PROCESSING:

Operations are carried on of the data

STORAGE:

Saving the data for future purpose

OUTPUT:

Presenting the result of the data

DELIVERY CHANNEL

Various modes of delivery may relate to either delivery of information as well as delivery of product.

DELIVERY FOR INFORMATION	DELIVERY FOR PRODUCT
Intranet	Buying from shop
Notice	Online shopping
Email	Departmental store
Networking site	
Newsletter	
Magazine	
HOW TO CHOOSE THE CHANNEL	**HOW TO CHOOSE THE CHANNEL**
The medium opted should be such which provides maximum benefits and which is easily understandable and would be used by the user	The channel should have the ability to convince and capture the interest of customer

CONTROL OBJECTIVES

Control is set of policies and procedures that are designed to provide reasonable assurance that business objectives are achieved and undesired events are prevented, detected and corrected.

MAJOR CONTROL OBJECTIVES CAN BE CLASSIFIED AS BELOW:

AUTHORISATION

It ensures that all the transactions are approved by responsible persons

COMPLETENESS

All the valid transactions are recorded

ACCURACY

Transactions are accurate and consistent

VALIDITY

Transactions are as per management authorisation

SECURITY

Safeguarding and ensuring the safety of assets

ERROR HANDLING

Errors are detected and reported

SEGREGATION OF DUTY

Dividing or bifurcating the duty helps in better performance and reduced error

CONTROL CAN BE:

PREVENTIVE CONTROL:

To prevent the occurrence of error by adopting security measures

DETECTIVE CONTROL:

In order to ensure errors are detected, audit trial is helpful

CORRECTIVE CONTROL:

Control which reduces the damage caused and taking precaution for the same

INFORMATION SYSTEM CONTROL

It is not possible for an auditor to track and trace all the data processing and evaluate the same taking place within the organisation and hence organisation itself has to take certain precautions and controls which are classified as below:

MANAGERIAL FUNCTION BASED CONTROL

TOP MANAGEMENT AND INFORMATION SYSTEM MANAGEMENT CONTROL:

They are the policy makers who are mainly concerned about planning, organising, leading and controlling

SYSTEM DEVELOPMENT MANAGEMENT:

They are mainly concerned about the analysing, designing and implementing of the information system.

PROGRAMMING MANAGEMENT CONTROL:

Mainly involved in the implementation of high quality program. It is divided into life cycle which is planning, design, coding, testing, operation and maintenance.

DATA ADMINISTRATION CONTROL

Data are the major source which helps in converting the same into meaningful term referred as information. Managing the data, source of data and warehousing the same is to be considered.

QUALITY ASSURANCE MANAGEMENT CONTROL

Customers are more and more demanding with regard to the quality of the software they employ for carrying on the work (in order to operate) and hence focus over quality is essential.

SECURITY MANAGEMENT CONTROL

Threats can be either in the form of fire, water, voltage fluctuation, virus, hackers. Control over the same for the safety and security is to be maintained.

OPERATION MANAGEMENT CONTROL

It takes into account daily operation of running hardware and software facility

APPLICATION FUNCTION BASED CONTROL

BOUNDARY CONTROL

Such control is essential in order to establish the identity and authentication of the users. In order to protect the data from outsiders or unauthorised users, such measures or precautions are taken such as cryptography, PIN, digital signature.

INPUT CONTROL

Data which is required to be fed into an application system. Ensuring the accuracy and completeness of the same. Controls such as source document control, data coding control, validation control, batch control.

COMMUNICATION CONTROL

It ensures that transportation of data among various other sub systems takes place in a reliable manner. Control is essential in the areas such as line error control, flow control, internetworking control.

PROCESSING CONTROL

At the time of processing the data, controls which are required to be identified is to be taken into account such as reasonableness verification, edit check, recovery control.

OUTPUT CONTROL

Data which is processed and the outcome or the result which is obtained and the areas where it is saved or stored and safeguarded has to be controlled such as control over printing, reports and its distribution, storage and logging of various output which may be sensitive.

DATABASE CONTROL

Storing the data, maintaining, modifying for further future usage and control over the same is to be ensured.

VIRTUALIZATION

It means to create a virtual version such as server, storage, network wherein the framework divides the resources into one or more execution environment e.g.: dividing or partitioning hard drive would amount to virtualization as one drive is divided into 2 separate hard drives.

Various types of virtualization can be:

1. Hardware
2. Network
3. Storage

GRID COMPUTING

It is a computer network in which each computer resource is shared with every other computer in the system in order to solve the complex problems. In grid computing, server or pc would run independent tasks.

BENEFITS OF GRID COMPUTING

1. Making use of underutilised resources
2. Resource balancing
3. Parallel CPU capacity
4. Reliability
5. Management

USER'S PERSPECTIVE

The user of grid computing has to consider following aspects:

INSTALLING A GRID SOFTWARE

Install a grid software on his machine that would require authentication

LOGGING ONTO THE GRID

Users then log onto the grid using an ID and can further carry on the processing

QUERIES AND SUBMITTING JOBS

Any query of the user can be submitted and tracking the same is possible

MONITORING PROGRESS AND RECOVERY

Identifying and monitoring the rate of progress and the level of recovery made can be easily identified.

ADMINISTRATIVE PERSPECTIVE

Following are the areas which are to be considered for the purpose of grid computing on the side of administrator:

1. Planning
   - Security
   - Organisation
2. Installation
3. Certificate Authority
4. Data Sharing

AUDITORS AND ACCOUNTANTS CONCERN WITH REGARD TO AUDITING IN COMPUTERISED ENVIRONMENT

As comparing the traditional system of record keeping and maintaining currently with the change in the system, digitalisation of data exerts pressure not only to the organisation but also to the accountant and auditor who utilises such data for decision making purpose.

AUDIT OBJECTIVES

1. Existence
2. Verification & authorisation
3. Cut-off
4. Compliance
5. Operational

MAJOR AREAS OF CONTROL

1. Change in custody of files
2. Transfer of responsibility
3. Decline of accountability

COMPUTING

Computing means deriving the benefit from or creating computer. It is also referred as combination of various kinds of information, managing the same and doing scientific study using computer and at the same time, making the computer system to behave smartly and intelligently.

SUB-DISCIPLINES OF COMPUTING

COMPUTER SCIENCE	COMPUTER ENGINEERING	INFORMATION SYSTEM	INFORMATION TECHNOLOGY	SOFTWARE ENGINEERING
It is referred to as study of the structure and mechanism with regard to methodologies and accessing the information in order to conduct various scientific study.	Computer engineering, electrical engineering and other systems ensure not only on the system as to which hardware and software helps in operating of computer but also using the same for various other purpose.	Usage of computer with regard to collection, storage and distribution of data suitable for organisational purpose.	Mainly facilitates for e-commerce, internet and processing of information in enterprise.	Usage of computer for application of engineering to software.

SERVER AND TYPES OF SERVER

Server is a service provider computer to serve the needs and requirements of user when needed.

VARIOUS TYPES OF SERVER CAN BE CLASSIFIED AS BELOW:

- File server
- Print server
- Network server
- Application server
- Mail server

INSTRUCTION SET ARCHITECTURE (ISA)

It is a set of machine code instructions that the processor shall carry out. It also gives direction to the processor to read and write values to perform calculation, computation and other logical operation.

Complex instruction set computer	**Reduced instruction set computer**
Numerous of micro electrical circuit to control signal.	In order to execute each instruction, there is separate electronic circuit.
Each micro circuit is activated for processing.	It is also known as hard wired approach.
It is complex as well as expensive. Mainly it is used in Pentium 2 or Pentium 3.	It consumes less power and high performance. It is less complex and less expensive. Mainly used in IBM as a processor.

CLOUD COMPUTING

Cloud computing is a use of various services such as software development platform, server, storage, software over the internet. Usage can be made from anytime, anywhere, at any place. Without the burden of the data of being stored or located in the system of user. It is mainly beneficial because the cost involved in the same is related to the usage basis.

DIFFERENT TYPES OF CLOUD:

PUBLIC CLOUD:

It is made available to general public or public at large. The services are administered and managed by third party over the internet and it is based on paper usage basis.

PRIVATE CLOUD:

It is mainly used by the organisation within the boundaries for organisational benefit. It is also known as internal cloud.

COMMUNITY:

It refers to sharing of computing infrastructure between organisations of same community e.g.: all govt. Organisations or all professionals may use such services.

HYBRID:

It is a combination of public, private or community cloud.

ARCHITECTURE OF CLOUD COMPUTING:

FRONT END:

It mainly comprises of client devices I.e. fat client, thin client or mobile devices which provide services to the user.

BACK END:

It refers to as various storage, server which provides required services to the user. It also uses a special type of software which is known as middle ware that allow computers on a network to communicate with each other.

SERVICES MODEL OF CLOUD COMPUTING:

INFRASTRUCTURE AS A SERVICE(IAAS):

It provides client with access to the server, hardware, storage and other computing resources. The services are made on a usage basis.

SOFTWARE (SAAS):

It provides user to access the software application on pay per use basis without the requirement of installing and running the application. It also provides the benefit of commercial software at a reasonable price.

PLATFORM (PAAS):

It provides access to the client with basic operating software and optional services without the need to buy and manage the same.

NETWORK (NAAS):

It provides user to use the network or transport connecting services.

COMMUNICATION (CAAS):

It provides business to use communication devices and modes on usage basis by eliminating large capital investment e.g.: video conferencing and instant messaging.

MOBILE COMPUTING

It is a portable computing device such as laptop or mobile phone which helps the user to access the internet either at home or at office. Mobile hardware comprises of mobile device which may be either laptop, smartphone, tablet. This helps in receiving and transmitting signal. Mobile software which is the actual program that runs on the mobile hardware.

BUSINESS APPLICATION OF MOBILE COMPUTING:

1. Increase in workforce productivity
2. Customer service can be improved

3. It helps in modification and updation
4. Access data anytime, anywhere

INFORMATION SYSTEM LAYERS

LAYER 1: APPLICATION PROGRAM/SOFTWARE

The software which is used and helps the computer to perform numerous tasks besides running the computer. Application software may be of various types such as:

1. Enterprise software
2. Enterprise infrastructure software
3. Information worker software
4. Educational software

Application software helps in meeting the user needs and helps in regularly updating although certain disadvantage does exist i.e. it is costly and subjected to attack.

LAYER 2: HARDWARE

Hardware refers to as the component which can be seen and touched. It consists of devices such as:

INPUT DEVICE:

Is used such as keyboard, mouse, scanner, microphone for providing data, image, voice-based input.

PROCESSING DEVICE:

The main function of processing device is that it includes computer chip that contains Central Processing Unit (CPU) and main memory. It has 3 functional units:

CONTROL UNIT

It controls the flow of data to and from the memory.

ARITHMETICAL LOGICAL UNIT (ALU):

It mainly performs arithmetic operations such as addition, subtraction, multiplication and comparison.

REGISTER:

It keeps the record of all the processing and frequency of the same.

STORAGE DEVICE:

Various devices which are used for the storage are categorised as below:

CACHE MEMORY:

The speed difference between register and primary memory is compensated by cache memory which helps in storing and copying of data which are frequently used in the main memory which helps in benefitting and saving the time in a computer system.

MAIN MEMORY:

a. RAM-
   - It is volatile in nature.
   - Information can be read as well as modified.
   - Information is lost as soon as the power is turned off.

b. ROM-
   - Non-volatile in nature.
   - Information can be read but not modified.
   - Even in case of power failure, information remains. Apart from primary memory;
     - Secondary memory such as pen drive, floppy disk, hard drive;
     - Virtual memory: Moving the data from RAM to a space which is known as paging file. Moving the data freeze up the ramp to complete its work.

OUTPUT DEVICE:

They are the devices through which system responds. Various types of output devices are laser printer, inkjet printer, plotter, speaker.

LAYER 3: OPERATING SYSTEM

It is a set of computer program that manages computer hardware resources and acts as a interface with the computer program. Numerous services or activities of operating system is classified as below:

1. Performing hardware function
2. Memory management
3. Task management
4. Networking capability
5. File management

LAYER 4: NETWORK

It is the mode or medium i.e. collection of computer and other hardware which are inter-connected by communication channel that allows sharing of resources and information.

LAYER 5: DATABASE MANAGEMENT SYSTEM [DBMS]

Data means to give(?). It is a collection of facts wherein all the data are stored and can be utilised as per the requirement. Various modes or database model can be classified as below:

HIERARCHY DATABASE MODEL

a. Records are arranged in a hierarchy of relations
b. It is in an inverted tree pattern
c. It represents one-to-one or one-to-many relationship
d. The top parent record is called the root record
e. All the records in a hierarchy are called nodes

NETWORK DATABASE MODEL

a. It is built up on multiple branch concept
b. It views each record in set

c. As compared to hierarchy model, it permits a record to be a member of more than one set at a time
d. It implements many-to-one and many-to-many relationship
e. It can be entered and handled more flexibly

RELATIONAL DATABASE MODEL

a. Both in hierarchy system and network model, data can be processed one record at a time. However, it is not so in case of relational model.
b. Records can be organised in table structure
c. It contains multiple table with at least similar value occurring in two different records
d. A key can be used to identify a row in a table which is called primary key

OBJECT ORIENTED DATABASE MODEL

a. It is helpful in storing complex data such as images, audio and video.
b. Data is modelled and created as object

ADVANTAGES OF DBMS

1. Data sharing
2. Data redundancy
3. User friendly
4. Improved security
5. Faster application

DISADVANTAGES OF DBMS

→ Costly and security aspect

LAYER 6: USER

The person who is using the system and which may include people who manage, run or maintain the system.

SYSTEM DEVELOPMENT LIFE CYCLE

Phase 1: SYSTEM INVESTIGATION

Phase 2: SYSTEM ANALYSIS

Phase 3: SYSTEM DESIGNING

Phase 4: SYSTEM IMPLEMENTATION

Phase 5: MAINTENANCE AND REVIEW

FLOWCHART

It is a type of diagram that represents work flow process. It helps in analysing, designing, documenting or managing process in various fields. Flowchart can be classified as:

- Document Flowchart
- System Flowchart
- Program Flowchart

ADVANTAGES:

1. Facilitates in depicting the relationship
2. Helps in communication
3. Documentation
4. Checking out of problems

DISADVANTAGES:

1. Complex
2. Difficulty in modification
3. Not suitable for reproduction