

Jai Mata Di

MICS

Management Information and Control Systems

C.A. (Final)

Summary Notes

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CHAPTER'S

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Note:

Following topic is not covered in the notes:-

- 1) Application Control
- 2) General Control

CHAPTER-1

BASIC CONCEPTS OF SYSTEM

SYSTEM:

Concept provides a **framework** for many organizational Phenomena's.
including feature of Information system.

Definition of System:

Defined as a **set of interrelated elements** that operate collectively to accomplish some **common** purpose or goal.

Exp:

1. Human body-sets of system.
2. Computer based information system.

TYPES OF SYSTEM

System can be:

- A) **Abstract:** is an orderly arrangement of interdependent ideas or constructs.
- B) **Physical:** is a “**set of elements**” which operates together to accomplish an objective.

Physical system (Simple system Model)

Input-----Process-----Output

SYSTEM ENVIROMENT

A) **SUB-SYSTEM**: - is a part of a larger system. Each system is composed of Sub-system, which in turn is made up of other sub-system, each sub-system being delineated by its boundaries.

The interconnection and interactions between the sub-systems are termed **Interfaces**.

Interface occurs at the boundary and takes the form of Inputs and Outputs.

B) **SUPRA SYSTEM**: refer to the entity formed by a system and other equivalent systems with which it interacts.

TYPES OF SYSTEMS

1) Deterministic and Probabilistic system:

Deterministic system:

Operates in a **Predictable manner**. The interaction among the part is known as certainty.

An example: - A correct computer program, which performs exactly according to a set of instruction.

Probabilistic system:

- + Can be described in term of **Probable behaviors**.
- + But a certain **degree of error** is always attached.
- + To the **prediction** of what the system will do.

An example:

- 1) Inventory system.
- 2) Set of instruction given to a human who, for a Variety of reasons, may not follow the instructions exactly as given.

2) Closed and open system:

Closed System:

- 1) **Self contained**.
- 2) Doesn't **interacts or make exchange** across its boundaries with its environment.
- 3) Don't get **feedback**, they need from external environment.
- 4) And tend to **deteriorate**

Closed system means- Relative closed system.

Relative Closed System (RCS):

RCS is one that has only **controlled and well-defined** input and output. It is not subject to disturbances from outside the system.

Open System:

- 1) **Actively interact** with other system.
- 2) Establish exchange relationship.
- 3) They exchange-information, material or energy with the environment including random and undefined inputs.

SUB-SYSTEMS

MAY-2003

DECOMPOSITION:

- A **complex system** is difficult to comprehend when considered as a whole.
- Therefore the **system is decomposed** or factored into subsystems.
- The process of decomposition is continued with subsystem divided into smaller Subsystems until the smallest subsystems are of **manageable size**.

“Decomposition is the factoring of an information processing system into Subsystem.”

Example

Information system divided into the subsystems:

1. Inventory
2. Marketing
3. Sales
4. Accounting
5. Planning

6. Production

7. Personnel/HR: -Subsystems are given below:

1. Creation of payroll report
2. Personnel report
3. Payroll report
4. Report for Govt. /Mgt.
5. Hourly payroll preparation.

SYSTEM STRESS AND SYSTEM CHANGE

NOV-2005

System, whether they are:

-**Living or artificial** system.

-**Organizational** system.

-**Information system** or system of **control**,

Change because they **undergo stress**.

A **stress** is a force transmitted by a system's supra- system that causes a system to change, so that the supra-system can achieve its goals.

In trying to **accommodate** the stress, the system may impose stress on its subsystem and so on.

TYPE OF STRESS

Two basic forms of stress:

- 1) A change in the **goal** set of the system.

New Goal-----created and old goals-----eliminated

- 2) A change in the achievement levels desired for existing goals, it might be

Increased or decreased.

CONSEQUENCES OF STRESS:

When a supra-system exerts stress on a system.

- The system will **change** to accommodate the stress or
- It will become **Pathological**.
- It will **decay and terminate**.

PROCESS OF ADAPTATION:

System accommodates stress, through a change in form.

There can be: -

- 1) Structural changes
- 2) Process changes

MAY-2006

INFORMATION

Information is the data that have been put into a **meaningful and useful context**.

Characteristics of information: -

- 1) Timeliness
- 2) Purpose
- 3) Mode and format
- 4) Redundancy
- 5) Rate of transmission
- 6) Frequency
- 7) Completeness
- 8) Reliability
- 9) Cost benefit analysis
- 10) Validity
- 11) Quality

BUSINESS INFORMATION SYSTEMS

A system is simply a set of components that interact to accomplish some purpose.

For exp: A business is also a system.

CATEGORIES OF INFORMATION SYSTEM:

- 1) Transaction Processing System (TPS)
- 2) Management Information System (MIS)
- 3) Decision Support System (DSS)
- 4) Executive Information System (DCS)
- 5) Expert System

NOV-2001

CATEGORIES OF INFORMATION SYSTEM

1) Transaction Processing System (TPS):

- **Operation** oriented system.
- **Computer** based system.
- Processing of **business** transaction.
- Improving the **routine business** activities.
- Provides **speed and accuracy**.

2) Management Information System (MIS):

- Assist managers in **decision-making** and **problem solving**.
- They **use** results produced by TPS.
- And also used other **information**.

3) Decision Support System (DSS): NOV-2002

- **Not** all decision is of a **recurring nature**.
- Some occur only once or recur in frequently.
- **DSS**: - are aimed at **assisting managers** who are faced with unique non-recurring decision **problems**.
- **DSS** must have **greater flexibility**.

4) Executive Information system (EIS):

- EIS are designed primarily for the **strategic level** of mgt.
- They **enable** executive to extract summary data from the **database** and model complex query languages.

5) Expert System (ES): May 2004

- ES are designed to **replace the need for a human expert**.
- They are particularly important, where **expertise is scarce** and **expensive**.

CHAPTER -2

TRANSACTION PROCESSING SYSTEM

The term of **Accounting Information System** includes the **variety of activities** associated with an organizations transaction processing cycles.

A transaction processing cycle **organizes** transaction by an organization business processes.

FOUR COMMON CYCLES OF BUSINESS ACTIVITY

- 1) **Revenue Cycle**: Event related to the distribution of goods and service to the other entities and the collection of related payment.
- 2) **Expenditure Cycle**: Event related to the acquisition of goods and services from other entities and the settlement of related obligations.
- 3) **Production Cycle**: Event related to the transformation of resources into the goods and services.
- 4) **Fianace Cycle**: Event related to the acquisition and mgt of capital funds including Cash.

COMPONENTS OF THE TRANSACTION PROCESSING SYSTEM

- 1) Input
- 2) Processing
- 3) Storage
- 4) Computer storage
- 5) Computer Processing
- 6) Output

Input-----Processing-----Output

TYPES OF FILES

From Study

CHAPTER-3

BASIC CONCEPTS OF MIS

MIS -Management Information System

Management Perform Management Functions.

Information Meaningful data in form of information.

System Set of interrelated elements that operate collectively to accomplish common objectives.

Definition:

“Structured to provide the information needed, when needed, where needed.”

MAY1996/MAY 1996

CHARACTERISTIC OF AN MIS

1. Management **Oriented**- For all levels of mgt.
2. Management **Directed**
3. **Integrated** -all systems and subsystems.
4. **Common data flow** -use of common input/output, procedures and media.
5. Heavy **Planning** element -must be present for MIS development.
6. **Sub-System** concept -breaking the MIS into subsystems.
7. **Common data base**- defines as super file.
8. **Computerized**- increase effectiveness.

For Remember: [3C 2M HIS]

MIS CONCEPTION OR MYTHS ABOUT MIS

1. The study of MIS is about **use of computer**.
2. **More data** in reports means more information for managers.
3. **Accuracy** in reporting is of vital importance.

NOV-98/NOV-99/MAY 2005

PRE-REQUISTES OF AN EFFECTIVE MIS**1. Date Base:**

- a) Super file
- b) User Oriented
- c) Common data base
- d) Available authorized person
- e) Control by DBMS.

2. Qualified system and management staff:

- a) Computer & System expert
- b) Management expert

3. Support of top management:

- a) Help from top mgt.

4. Control and maintenance of MIS:

- a) Control of MIS
- b) Maintenance of MIS

5. Evaluation of MIS:

Meeting the information needed in future as well as.

- a) **Flexibility** - to cope with any future requirement.
- b) **View of user** - about deficiencies in the system.
- c) **Guiding** - the authority about step to be taken to maintain effectiveness.

NOV-98/MAY 2002

CONSTRAINTS IN OPERATING A MIS

- 1) **Non-availability of Experts**
- 2) **Problem of selecting the sub-system**
- 3) **Varies objectives** of the concern
- 4) **Non-availability of Co-operation from staff**
- 5) **High turnover of experts** in MIS.
- 6) **Difficulty in quantifying the benefit of MIS.**

Remember: [2NV PHD]

NOV-1996/MAY 2003

EFFECTS OF USING COMPUTER FOR MIS

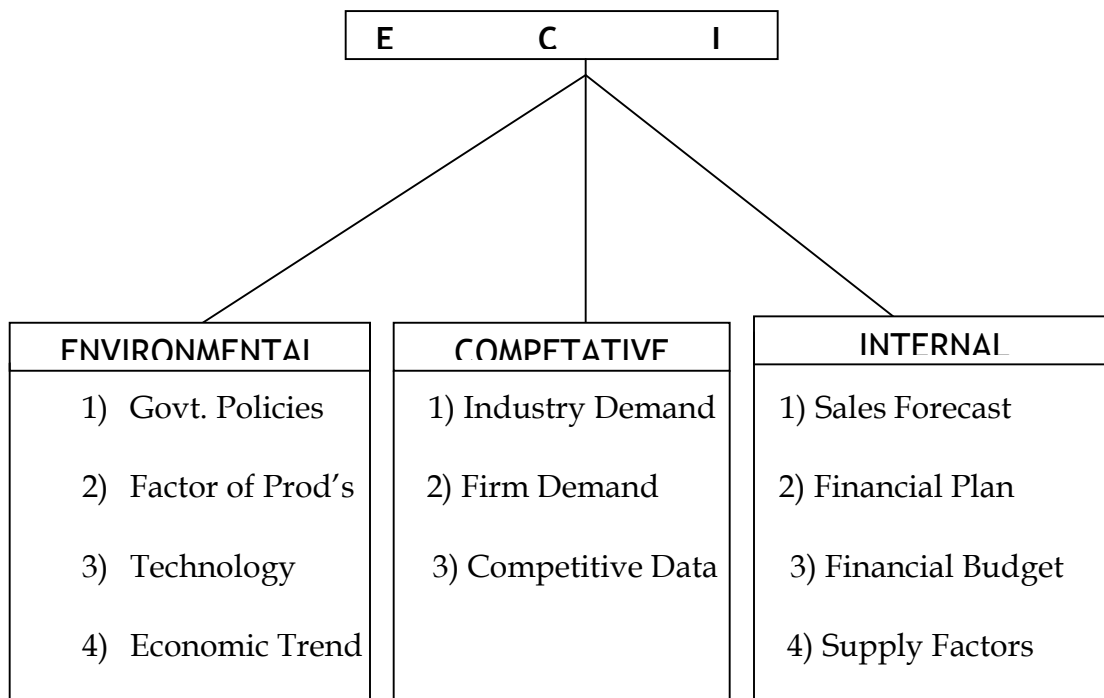
- 1) **Speed of Processing & retrieval** of data increase
 - 2) **Scope of use** of information system has expended
 - 3) **Scope of analysis** widened
 - 4) **Complexity** of system design & operation increased
 - 5) **Integrates** the working of sub-system
 - 6) **Increase the effectiveness** of information system
 - 7) **More comprehensive** information
-

LIMITATION OF MIS

- 1) **Quality of output** depends on quality of input.
- 2) MIS is not a **substitute of effective mgt.**
- 3) May not have requisite **flexible.**
- 4) Can't provide **tailor made information.**
- 5) Takes into account **quantitative factors.** (Ignore Non-quantitative)
- 6) Useful for making **Non Programmed decision.**
- 7) Effectiveness of MIS is **reduced**-Information **not shared** in the Organization with each other.
- 8) Effectiveness of MIS **decreases** due to **frequent changes** in top mgt.

MAY-2004

THE PLANNING INFORMATION REQUIREMENT OF EXECUTIVES



FACTORS ON WHICH INFORMATION REQUIREMENTS OF EXECUTIVE DEPENDS ARE:

- 1) Operational Function(OF)
- 2) Type of Decision Making
- 3) Level of mgt. Activity

1) Operational Function: -

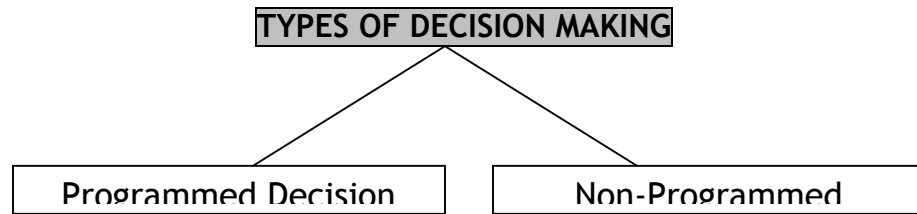
- a) **Grouping** of several **factional units** on the basis of related activities into subsystem.
- b) **Information required** depends upon the OF.
- c) The **content** of information depends on **activity performed**.

2) Type of Decision Making:

- a) Programmed Decision
- b) Non-Programmed Decision

3) Level of Management Activity:

- a) Strategic Level
- b) Tactical Level
- c) Supervisory Level



NOV-2001

PROGRAMMED DECISIONS AND NON-PROGRAMMED DECISIONS

1) **Programmed Decision**

A) Refer to:

- Decision made on **problems** and
- Situation by **reference**
- To a **Pre determined** set of: -
 - Procedure
 - Precedent
 - Techniques

Example:

In many ORZ there is a set of:

- 1) Procedure for receipts of material.
- 2) Procedure for Payment of bills.
- 3) Procedure for release of Budgeted fund.

- B) Decision making is **simplified**.
- C) They tend to be **consistent** over **situations and time**.
- D) **Not** much **judgments and discretions** is needed.

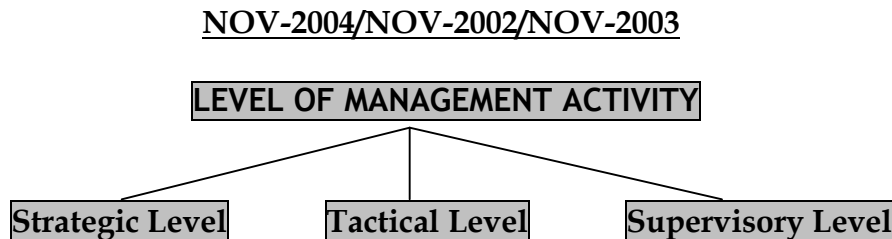
2) **Non -Programmed Decision**

A) **Refer** to those decisions: -

- Which are made on **Situation and Problems**.
- Which are **novel and Non-Repetitive**.
- Not much knowledge and information** are available.

B) They are made **not by reference** to any pre-determined guidelines.

C) Which is not "**Programmed Decision**".



Strategic Level (Higher Level of Management)

Strategic Level is concerned with

- Developing of organization mission.
- Objective and
- Strategies.

+ Handle the critical problems.

+ Vital impact on direction and functioning of ORZ.

Tactical Level (Middle Level of Management)

Tactical Level **lies** in Middle of management hierarchy

- 1) Managers:
 - Plan
 - Organize
 - Lead and Control

The **activities** of other managers.

FEATURES:

- 1) More **specific and functional**.
- 2) **Information** is easily available.
- 3) Less **complexity**.
- 4) Decision variable can be **forecast**.

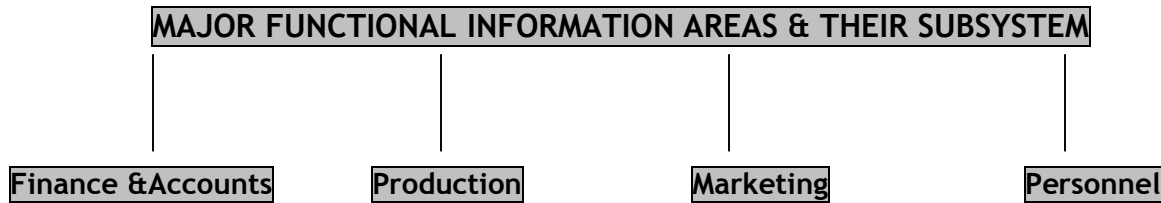
“Tactical decisions are made with a strategic focus”.

Supervisory Level (Lowest Level of Management)

- Manager at this level coordinates the work of other employees.
- Ensure that specific task is carried out.

CHAPTER-4

SYSTEM APPROACH AND DECISION MAKING



NOV-1997

FINANCIAL DECISION

Deals with the: -

1. Procurement of fund
2. Effective utilization of fund

With the help of FIS:

- 1) Estimation and requirement of **fund**
- 2) **Capital structure** decision
- 3) **Capital budgeting** decision
- 4) **Profit Planning**
- 5) **Tax Management**
- 6) **Working Capital** management
- 7) **Current asset** management

PRODUCTION SCHEDULING

“Planning the specific time at which product item should be manufactured.”

OBJECTIVE OF PRODUCTION SCHEDULING

M- To **minimize** the idle time.

A- To **access** the need of subcontracting.

D- To **determine** the stage of Production.

E- To **ensure** the target dates for completion the Production.

S- To **studied** the alternative source of Production.

MAY -2003

MATERIAL REQUIREMENT PLANNING (MRP)

- 1) One approach to improve “Production Efficiency”.
- 2) Integrates several Production related information system.
- 3) Improves inventory management and production scheduling.

Benefits:

- 1) Decreased **inventory level** and carrying cost
- 2) Fewer **stock shortage**
- 3) Increased **effectiveness of** production supervisor.
- 4) Better **customer service**
- 5) Greater responsive to **change**
- 6) Closer **coordination**-Mgt, Engg.and Finance

MAY 1998/NOV 2000/MAY 2004

PERSONNEL SYSTEM

“Deals with the flow of information about people working in the ORZ as well as future personnel needs”.

Sub system:

- 1) **Recruitment**-recruit the person
- 2) **Placement**- task of matching person with requirement.
- 3) **Training and Development**- due to technological changes.
- 4) **Compensation**- determines pay and benefits.
- 5) **Maintenance**-Personnel procedure and policies.
- 6) **Health and safety**- Health of Personnel and Safety of Job.

NOV-2005

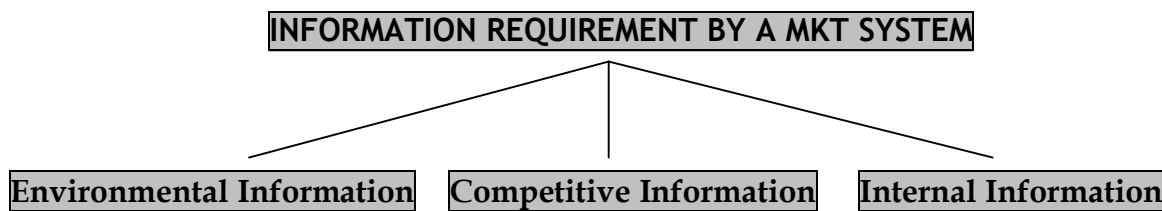
SYSTEM APPROACH

Process of System Approach:

- 1) **Defining** of Problem or opportunity
- 2) Gathering & **Analyzing data**
- 3) **Identify** alternative solutions
- 4) **Evaluation** of various alternatives
- 5) Selecting the **best alternative**
- 6) **Implement** & solution

ROLE OF COMPUTER IN DECISION MAKING

- 1) Fairly & accurately **forecast**.
- 2) Prepare short term **Profit plan**.
- 3) Prepare long range **Projection**.
- 4) Provide preplanning **Information**.
- 5) Calculate **Variances**.
- 6) Assist in **Planning**.



Note: Same as per Chapter-3 Q- [ECI]

MARKETING SYSTEM

Major Areas:

1. Sales:-
 - Sales Support
 - Sales Analysis
2. Market Research and Intelligence
3. Advertisement and Promotion
4. Product Development and Planning
5. Product Pricing System
6. Customer Service

PRODUCTION SYSTEM

Major Areas:

1. Production Planning
2. Production Control
3. Production Scheduling
4. Material requirement Planning

PRODUCTION PLANNING

For Determining:

1. What shall be produced?
2. When it should be produced.
3. How it should be produced.

BASIC INFORMATION REQUIREMENT OF PRODUCTION PLANNING & CONTROL SYSTEM (NOV-2004)

- 1) Firm **Policy**-regarding various products.
- 2) **Sales Order**, Forecast, Stock Positions-order backlog
- 3) Available **Hours**-force with capabilities.
- 4) Standard of **labour time**
- 5) Schedule of meeting **the sales orders**
- 6) **Quality** Norms-for material to be used.
- 7) **Break up** the jobs and their resource requirement.

DISADVANTAGES OF GROUP DECISION MAKING

1. Delay in **decision making**
2. Lack of **rationality**
3. Responsibility among the **group members**
4. Dilution of **quality** of decision by compromise
5. **Conformity** among member of the group

CHAPTER-5

DECISION SUPPORT & EXECUTIVE INFORMATION SYSTEM

DSS (Decision Support System)

DSS can be defined as:

- + A **system**
- + That provide **tools**
- + to **managers** to **assist** them
- + in **solving semi-structured** and
- + **Unstructured problem**
- + in their **own way**.

MAY-2005

CHARACTERISTICS

- 1) They support in **Decision-Making**.
 - Support semi-structured decision-making.
 - Support unstructured decision-making.
- 2) They are **flexible**.
- 3) They are **easy to use**.

COMPONENTS OF DSS

- 1) **User-Manager.**
- 2) **One or more data base**-routine or non-routine data.
- 3) **Planning language**-General purpose or special purpose language.
- 4) **Model base**-is called brain.

Note: Refer Diagram from Study

STEPS IN SOLVING A PROBLEM WITH A DSS

- 1) **Define and formulate** problem
- 2) **Frame** problem into **DSS Model**
- 3) **Use model** to obtain **results**
- 4) **Reformulate** problems

MAY-2003/MAY-2001/NOV-2005

EXECUTIVE INFORMATION SYSTEM

EIS:

- A tool
- that provides
- On line access to relevant information
- in a useful and navigable format.

Relevant Information means:

- + Timely
- + Accurate
- + Actionable information

Useful and Navigable format means:

- + Specially designed to be used by individual.

PURPOSE OF EIS

1. Support **managerial learning** about the organization.
2. EIS allow **timely access** of information.
3. EIS is **commonly misperceived**-specified the problem areas to management.

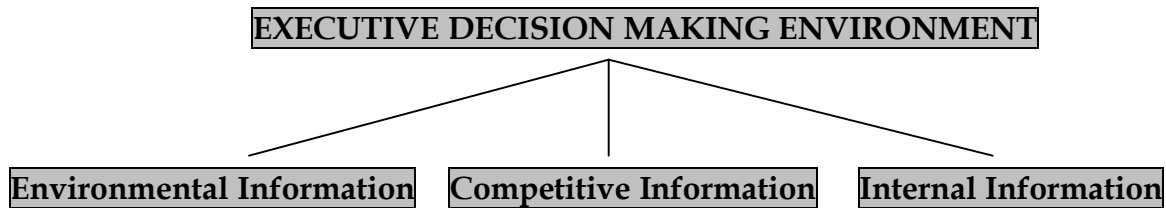
EIS DIFFER FROM TRADITIONAL INFORMATION SYSTEMS IN THE FOLLOWING WAYS (NOV-2002):

- 1) Specially **tailored**
- 2) **Access data** about **specific issue**
- 3) Extensive **online analysis tool**
- 4) Access **internal & external data**
- 5) **Easy** to use
- 6) Used **without assistance**
- 7) **Screen** based
- 8) Presented information in **graphical form**
- 9) Presented report in **summary format**
- 10) Ability to **manipulate data**.

A practical set of principles to guide the design

EIS Measures/Content of EIS:

1. Easy to **understand and collect**.
2. EIS must be based on a **balance view of organization objective**.
3. **Performance indicators** in an EIS must reflect.
4. Encourage management and staff to share **ownership of objective**.
5. EIS information must be **available to everyone** in the ORZ.
6. EIS measure must evolve to **meet the changing need of ORZ**.



Note: Same as pervious chapter.

FIVE CHARACTERSTICS OF THE TYPES OF INFORMATION USED IN EXECUTIVE DECISION MAKING:

- 1) Lack of **structure**-Semi structured and Unstructured
- 2) High degree of **uncertainty**
- 3) **Future orientation**-for shape of future events
- 4) **Informal Source**-for key of information
- 5) **Low levels of detail-decisions are** made by observing broad trend.

Points: SUFIL – Structure / Uncertainty / Future / Informal / Low Level

CHAPTER-6

ENABLING TECHNOLOGIES

CLIENT SERVER (May-2005)

Refer to:

- Computing technologies**
- in which **hardware and software** (Computer)
- are **distributed** across the **network**.

Hardware & Software means Client & Server.

WHY CHANGE TO CLIENT/SERVER COMPUTING

Reasons for switch over or adoption:

- 1) **Improving** the flow of **mgt information**
- 2) **Better Service** to End Users
- 3) Lowering **IT cost**
- 4) The **ability to manage** IT cost better
- 5) **Direct access** to required data
- 6) **High flexibility** of information processing
- 7) **Direct control** of the operation system

MAY-2004

BENEFITS OF CLIENT /SERVER TECHNOLOGY

In short: Refer study also

- 1) People makes **job easier**
- 2) Reduce total **cost of ownership**
- 3) Increase **Productivity of end user/ developer.**
- 4) **Expense** of H/W & S/W are less
- 5) **Easy** to access
- 6) **Reduce the cost** of the client **computer**
- 7) Reduce the cost of **purchasing**
- 8) Mgt **control over the ORZ increased.**
- 9) Easily **implemented**
- 10) Leads new **technologies**
- 11) Easy to add **new hardware**
- 12) Long term **cost benefits** for development and support.

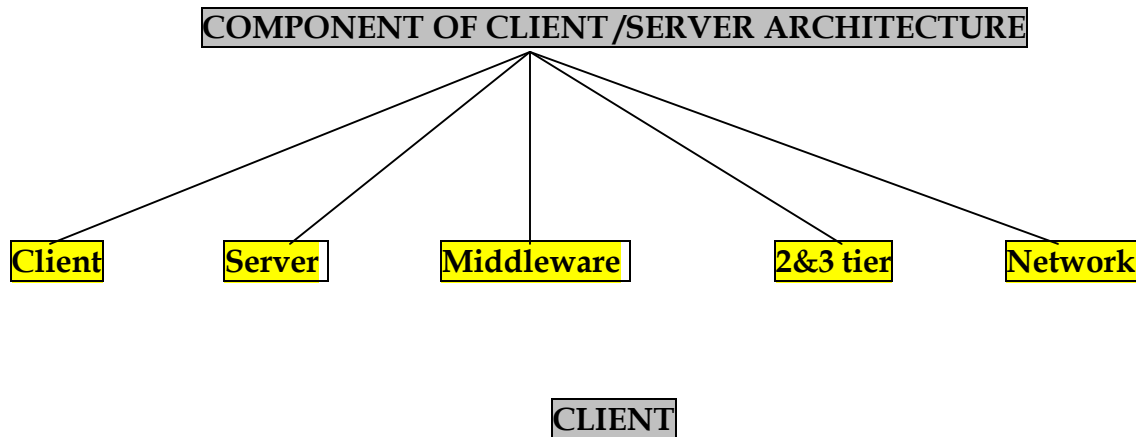
MAY-2003

CHARACTERSTICS OF CLIENT/SERVER TECHNOLOGY

- 1) Consist of **H/W & S/W** (Client /Server Process)
- 2) Client & Server Portion can be operating **on separate computer**
- 3) **Either** of the platforms can be upgraded
- 4) Service to **multiple clients**

- 5) **Networking** capability
- 6) **Application logic** resides at client end
- 7) **Action** is usually initiated at the client end
- 8) A **GUI** reside at the client end
- 9) A **SQL** Capability
- 10) **Data Protection & Security**

NOV-2003



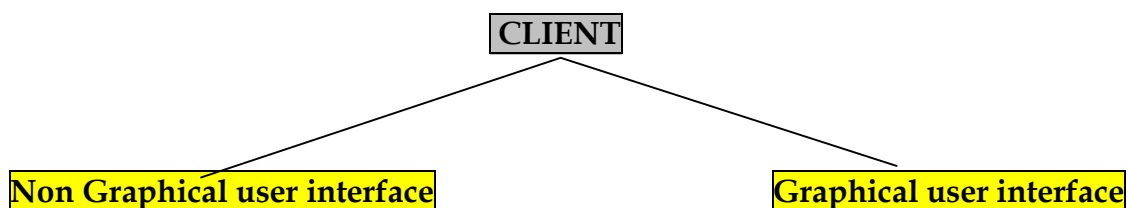
Types of Clients:

1) **Non Graphical user interface:**

Require minimum amount of interaction with people.
Like-ATM, Cell Phone and FAX machine

2) **Graphical user interface**

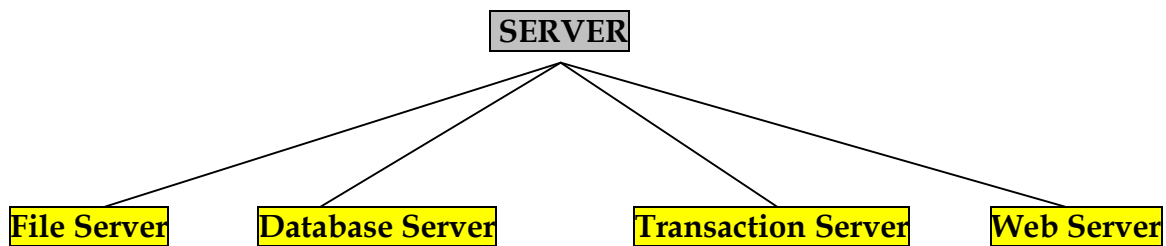
Can be describing as human interaction model.



SERVER

Types of Server:

- 1) **File server**- make it possible to share file across the network.
- 2) **Database server**-Processing power to execute SQL request form clients.
- 3) **Transaction server**-Execute a series of SQL command as an OLTP.
- 4) **Web server**-Allow client & server to communicate with HTML.



Notes:

MIDDLEWARE

Network system implemented in client server technology is called **middleware**.

Composed of **four layers**:

1) **Service layer:**

Carries:

- a) Coded instruction
- b) Data from software application

2) **Back end processing:**

- a) Encapsulating network routine instructions.

3) **Network operating system:**

- a) Additional instruction to transport stack.

4) **Transport stacks:**

- a) Transfer data to packets.

NOV-2004

FAT CLIENT OR FAT SERVER (2 TIER OR 3 TIER)

FAT CLIENT SYSTEM (2 TIER)

- 1) More of the processing takes place on the client end.
- 2) Like file server and database server.
 - a) **File Server:** Share file across the networks.
 - b) **Database Server:** Processing power to execute SQL request from clients

FAT SERVER SYSTEM (3 TIER)

More of the processing:

- 1) Place more emphasis on the server and
- 2) Try to minimize the processing done by client.

Ex:

Fat servers are transaction server and web server.

SERVER CENTRIC MODEL

Server centric is model, in which application are deployed managed, supported and executed 100% on a server. It is multi-user operating system.

Enables:

1. Heterogeneous computing environment-Provide access window based application.
2. It offers Enterprises Scale Mgt Tools
3. It also provides Seamless Desktop Integration of users local and remote resources and application with exceptional performance.

NOV-2004

CLIENT SERVER SECURITY

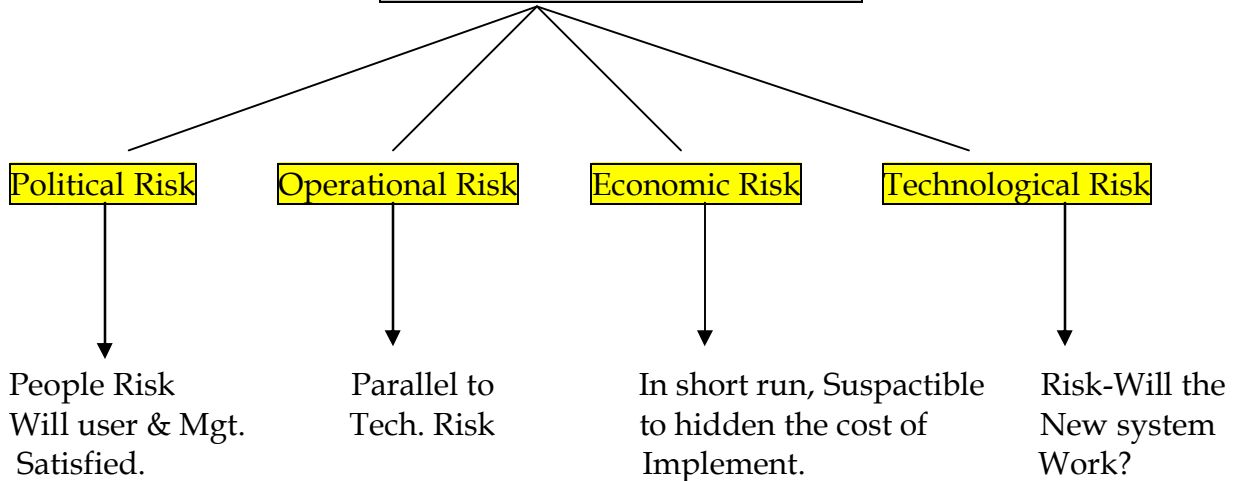
IS auditor should ensure that following control techniques are in place.

To increase security:

- 1) Disabling floppy disk drive
- 2) Prevent unauthorized access
- 3) Prevent unauthorized user
- 4) Data encryption technique-to protect from unauthorized access.
- 5) Application control
- 6) Network monitoring
- 7) Authentication system
- 8) Smart card can be used

NOV-2002/NOV-2004

CLIENT SERVER RISK AND ISSUES



CHAPTER-7

SYSTEM DEVELOPMENT PROCESS

SYSTEM DEVELOPMENT:

Refer to the-

- ✚ Process of examining
- ✚ a business situation
- ✚ with the intent of improving it
- ✚ through better procedure and methods.

SYSTEM DEVELOPMENT LIFE CYCLE (NOV-2004/MAY-98/NOV-2000)

Starts when **management and personnel** relies that a **particular business system** need improvement.

SYSTEM DEVELOPMENT LIFE CYCLE METHOD CONSISTS OF FOLLOWINGS ACTIVITIES:

- 1) Preliminary Investigation
- 2) Requirement analysis
- 3) Design
- 4) Develop
- 5) Testing
- 6) Implement

It is also called Traditional approach of “**System Development**” .

1) **Preliminary Investigation:**

Undertaken when user come across a problem or opportunity & submit request for new system to MIS Dept.

Consists-Activities:

- A) Request clarification
- B) Feasibility study
- C) Request approval

2) **Requirement Analysis and system analysis:**

After study of preliminary investigation results:-

Process includes the following steps:

- a) Need of user
- b) Requirement of user
- c) Fact finding techniques and tools
- d) Identifying the features

3) **Design of the system:**

After the Step 1 and 2 start to design a system which will satisfy the requirement of user.

4) **Development of software:**

After the system design needs -specific type of

-Hardware

-Software

-Services

For development of customized software in-house after considering the cost of the software.

5) **System testing:**

1. Before implementation must be tested.
2. To ensure software doesn't fail.
3. Test data inputted and find results.
4. Satisfied the user and applicant.

6) **Implementation and development:**

1. After testing, system to be implemented in present system.
2. Hardware installed for user training.
3. Ensure that the need of user is satisfied.

NOV-2003

ACHIEVING THE SYSTEM DEVELOPMENT OBJECTIVE

There are many reasons why organization fails to achieve their system development objectives.

- 1) Lack of senior management support
- 2) Shifting user needs
- 3) Development of strategic system
- 4) New technologies
- 5) Lack of standard project management
- 6) Overworked_or under trained staff
- 7) Resistance to change
- 8) Lack of user participation
- 9) Inadequate testing and user training

MAY-1996/NOV-1997/MAY-2000

APPROACHES TO SYSTEM DEVELOPMENT

- 1) Traditional Approach- System Development Life Cycle
- 2) Prototyping Approach
- 3) End User development Approach
- 4) Bottom up Approach
- 5) Top Down Approach
- 6) Systematic Approach

End User Development Approach

Increasing use of this approach, due to availability of low cost technology.

User will be responsible for system development objective and not the computer professional.

Risk:

1. Decline in standard and control
2. Inaccuracy
3. Lack of adequate specification
4. Incompatible system
5. Difficulty in access

Top Down Approach

Assume a high degree of Top Mgt involvement in the Planning Process, organization goal and objective.

Stages:

1. Analyses the objective and goals.
2. Identify the function of ORZ with activities & decisions identified.
3. Prepare specific information processing program.

Systematic Approach

Use of MIS professional for development.

Steps:

1. Identify the requirement.
2. Suitable Software
3. Suitable Hardware
4. Implement the System

MAY-2001

PROTOTYPING APPROACHES

Traditional system approach may take year to analyses, design and implement a system

In order to avoid such delay, organizations are using prototyping techniques to develop smaller systems.

Such as:

+ Decision support system (DSS)

+ MIS

+ Expert system

STEPS (NOV-2002/MAY-2004)

- 1) Identify information system requirements.
- 2) Develop the initial prototype.
- 3) Test and Revise.
- 4) Obtain user signoff of the approved prototype.

(1) Requirement ----- (2) Develop ----- (3) Test & Revise ----- (4) User signoff

WHEN THE PROTOTYPE APPROACH SHOULD BE USED FOLLOWING CONDITIONS EXISTS:

- 1) **End user** does not understand their information need.
- 2) **System requirement** are hard to define.
- 3) **New system** needed quickly.
- 4) **Post interaction** –misunderstanding in user and designer.
- 5) **Risk**-with wrong system high.

ADVANTAGES (MAY-2000)

- 1) **Need and requirement** - Satisfied.
- 2) **Short time period** – Required to develop.
- 3) **User experiment** – Reliable and less costly.

DISADVANTAGES

- 1) **Time Consuming** Process.
- 2) **Inadequate Testing** and documentation.
- 3) **Dissatisfaction** by user.

NOV-2005

FACT FINDING TECHNIQUES

The following are the fact finding techniques:

- 1) Documents
- 2) Questionnaires
- 3) Interviews
- 4) Observation

NOV-93/MAY-99/MAY-02/MAY-05

ANALYSIS OF THE PRESENT SYSTEM

The following areas should be studied in depth:

1) **Review:**

- A) Historical aspects
- B) Data file maintained
- C) Method, Procedure and data communication
- D) Internal control

2) **Analyse:**

- A) Input
- B) Output
- C) Overall
 1. Present work volume
 2. Current personal requirement
 3. Present benefits and costs.

3) **Model of the exiting system:**

- A) Physical System or
- B) Logical System

Through flow chart.

NOV-2001/MAY-2003

SYSTEM DEVELOPMENT TOOLS

The Following are the system development tools:

- 1) **Component and flow of a system**- system analyst to document the data flow through flow chart.
- 2) **User interface**-designing the user interface in user and computer.
- 3) **Data attributes and relationships**-a data dictionary catalogs.
- 4) **Detailed system process**-help to programmer to develop tools.

DATA DICTIONARY

NOV-2002/MAY-2005

- + A computer file
- + contain descriptive information
- + about the data item in the files of Business Information System.

This information may include:

- 1) Codes - LTR-Length/Type/Range
- 2) Identity of source documents
- 3) Name of Computer files
- 4) Name of Computer Programs
- 5) Identity Computer file maintenance

CHAPTER-8

SYSTEM DESIGN

SYSTEM DESIGN:

Consist the following activities:

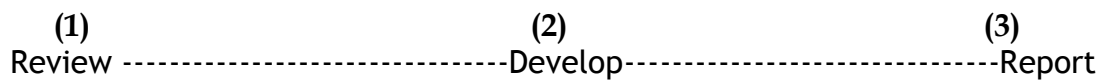
1) Reviewing the system:

- ✚ Information and
- ✚ Functional requirement

2) Developing a model of a new system:

- ✚ Contents Logical / Physical
- ✚ Process of Output from Input.

3) Reporting results to Management.



OUTPUT OBJECTIVE

NOV-2000

1) Convey information about:

- Past Activity
- Current
- Future

2) **Signal Important:**

- Events
- Opportunities
- Problem or Warning

3) **Trigger an action:**

4) **Confirmation of an action:**

IMPORTANT FACTORS IN OUTPUT DESIGN

NOV-2000/MAY-2001/MAY-2004

- 1) **Content**- Actual piece of data.
- 2) **Form**-Way of present the content to users.
- 3) **Output Volume**-Amount of data required at one time.
- 4) **Timeliness**-When user needs the output.
- 5) **Media**-Physical device used for Input-Process-Output.
- 6) **Format**-Manner of physical data arranges.

IMPORTANT FACTORS IN INPUT DESIGN

NOV-2001/NOV-2002/NOV-2005

- 1) **Content**- Type of the data that are needed.
- 2) **Timeliness**- Data inputted in the computer in time.
- 3) **Media**- Choice of input media device used for entering data in computer.
- 4) **Format**-Input format are considered after timeliness and media.
- 5) **Input Volume**-Amount of data that has to enter in computer at one time.

GUIDELINES FOR “FORM DESIGN”**MAY-99**

- 1) Making forms **easy to fill**
- 2) Meeting intended **purpose**
- 3) Ensuring **accurate completion**
- 4) Keeping **forms attractive**

SYSTEM MANNUAL**NOV-2003**

The basic output of system design is

-a description of the task to be performed and

-Complete with layouts and flow charts is

-called **job specification manual** or **system manual**.

Its contains:

- 1) **Description** of the **existing system**
- 2) **Flow** of the existing system
- 3) **Output** of the existing system
- 4) **General description** of the **New system**
- 5) **Flow** description of the new system
- 6) **Output** description of the new system
- 7) **Output** distribution
- 8) **Input** distribution
- 9) Input responsibility

- 10) List of Programs
- 11) Timing estimates
- 12) Control
- 13) Audit trails
- 14) Glossary of terms used

CODING METHOD

NOV-2001/MAY-2005

Word and relationships are expressed by a code are developed to reduce:

- 1) Input error
- 2) Control error

A Code is a brief number.

Characteristics:

- 1) **Individuality**: One code for one object.
- 2) **Space**: Coding must be much briefer than description.
- 3) **Convenience**: Short and simple codes.
- 4) **Expendability**: As per requirement in future to be fulfill.
- 5) **Suggestiveness**: Readily understandable.
- 6) **Permanence**: Changing circumstances should not invalidate codes.

CODING SCHEMES

- 1) **Classification Codes**- Place separate entities such as event/people/object in distinct classes.
- 2) **Functions Codes**- State the activities or work to be performed. System analyst uses this code frequently.
- 3) **Significant Digit Subset Code**-Can provide wealth of information to user and management.
- 4) **Mnemonic Codes**-Suitable when codes have to be remembered by people. For exp. MBA/CA/CS/CWA.
- 5) **Hierarchical Classification**- Similar as organization chart.

MAKING FORM EASIEST TO FILL

1. Form Flow
2. Divide form in logical sections
3. Captioning

GUIDELINES FOR PRINTED OUTPUT LAYOUT

1. Report & Document from left to right and top to bottom.
2. Important item-easiest to find.
3. Heading/ Title of the report and page no.
4. Each data should have separate heading.
5. Control break should be used.
6. Margin should be left.
7. Mock up report should review.

CHAPTER-9

SYSTEM ACQUISITION SOFTWARE DEVELOPMENT AND TESTING

Selection of a Computer System

The Following points may be considered:

- 1) Latest Possible **Technology**.
- 2) Computer **Performance**-speed, storage and computation.
- 3) **Software** Considerations.
- 4) Choice of the **Manufacturer**.
- 5) Choice of the **Model**.
- 6) Selection of the **Configuration**.

Advantage of Pre-Written Application Package

NOV-98/NOV-04/MAY-03/NOV-05

The Following are the advantages: -

- 1) **Rapid Implementation**
- 2) **Low Risk**
- 3) **Quality**
- 4) **Cost**

Step involved in selection of a computer system

Steps:

- 1) Prepare the **design specification**.
- 2) Prepare & distribution an **RFP** (request for proposal) to selected vendors.
- 3) **Eliminates** the inferior proposal of vendors.
- 4) Have vendor present their **proposals**.
- 5) **Analysis** the proposal & contact users.
- 6) Conduct equipment **benchmark tests**.
- 7) Select the **equipment**.

Vendor Evaluation

MAY-2005/ MAY-2006

The following factors have to be considered in relation to each proposed system:

- 1) **Performance Capability** in relation to Cost- capable to processing the ORZ data.
- 2) **Cost and Benefits**-Perform cost/benefit analysis of each proposed system.
- 3) **Maintainability**-Refer to modification or alter(Flexibility)
- 4) **Compatibility**-Ability to interface and implement the new system with exiting system.
- 5) **Vendor Support**-
 1. Help in implementing & testing the new system.
 2. Training Classes.
 3. Maintenance Contract/ Back up system.

Program Development life cycle or Software Development or in house creation of Program: -

IN HOUSE CREATION OF PROGRAM SIX STAGES

NOV-97/MAY-02/NOV-05

- 1) Program Analysis
- 2) Program Design
- 3) Program Coding
- 4) Program Debug
- 5) Program Documentation
- 6) Program Maintenance

PROGRAM DESIGN TOOLS

MAY-97/MAY-04

Followings are the Program design tools:

- 1) Program Flow chart
- 2) Pseudo code
- 3) Structure chart
- 4) 4GL Tools
- 5) Object oriented

1) **Program Flow Chart:** - Common design tools that manager, user encounter when reviewing the design work of system development project.

2) **Pseudo code:** - After reviewing the work of designing, users may also need to review narrative description of program logic.

Represent - Program logic instead of using Graphical symbols, present the program logic in English and program code more closely.

- 3) **Structure Chart:** - Similar to Corporate organization chart.
- 4) **4GL Tools:** - The various tools described above developed by manually applied method. Drawback of manually tools: -
- a) Lot of time to prepare.
 - b) Consistent

In 4GL -remove all drawbacks.

- 5) **Object Oriented:** - Provide means of enhancing programmer productivity and reducing the application back log common in much organization.

Object oriented software design result in a model that describes:

-Object

-Classes

-and their relationship to one another.

SYSTEM TESTING

MAY-2001/MAY-2002

System Testing done prior to installation of a system.

- 1) **Preparation** of realistic test data.
- 2) **Processing** the data (New Equipment).
- 3) **Checking** the results
- 4) **Reviewing** the results.

Preparation-----Processing-----Checking-----Reviewing
 (Test data) (Data) (Results) (Results)

CHAPTER-10

SYSTEM IMPLEMENTATION AND MAINTENANCE

SYSTEM IMPLEMENTATION

The Process of ensuring that:

- + The information system is operational,
- + then allowing user to take over it operation
- + For use and evaluation
- + Called implementation.

Includes all activity that takes place to convert from the old system to the new.

ASPECT OF IMPLEMENTATION

Components:

- 1) **Equipment** installation
- 2) **Training** personnel
- 3) **Conversion** procedure
- 4) **Post Implementation** evaluation

EQUIPEMENT INSTALLATION ACTIVITIES

Activities:

- 1) **Site Preparation**
- 2) **Equipment installation**
- 3) **Equipment check out**

CHANGEOVER OR CONVERSION

“Conversion or changeover” is the process of changing from the old system to new system

CONVERSION STRATEGIES

1) Direct Changeover:

Means on a fixed date the old system is dropped and new system is put into use.

Disadvantages:

- 1) Risk
- 2) Comparison

2) Parallel conversion :

Means running the both system parallel.

Advantages:

- 1) Checking
- 2) Security

Disadvantages:

- 1) Cost
- 2) Comparison of Output

3) Graphical conversion

Means attempt to combine the best feature without risk as earlier (1) and (2).

Advantages:

- 1) Checking
- 2) Detect Errors

Disadvantages:

- 1) Time Consuming

4) Modular Prototype conversion :

Means all processes are distributed in separated module wise.

5) Distributed conversion :

Means once entire conversion is done at one site, then other site are to be considered.

Advantages:

- 1) Detect Errors

Disadvantages:

- 1) Difference Problem

ACTIVITIES INVOLVED IN THE CONVERSION

MAY-99

- 1) Procedure conversion
- 2) File conversion
- 3) System conversion
- 4) Scheduling personnel and equipment
- 5) Alternative plans in case of equipment failure.

Note: Refer Study for summary

EVALUATION OF THE NEW SYSTEM

NOV-2004

Evaluation Provides:

The feedback necessary to assess-

- 1) Value of information
- 2) Performance of personnel
- 3) Technology included in newly designed system.

PURPOSE:

Basic dimension whether:

- 1) Newly developed system is operation properly.
- 2) User is satisfied.

TYPES OF EVALUATION**1) Development Evaluation**

Whether the system was developed on schedule and with in budgets

2) Operational Evaluation

Whether the Hardware, Software and Personnel are capable to perform their duties.

3) Informational Evaluation

Objective to provide information to support the organizational decision system.

SYSTEM MAINTENANCE**MAY-2001/NOV-2002/NOV-2005**

Most of Information system requires at least some modification after development. The need arise from a failure to anticipate all requirement or from changing ORZ requirement.

System maintenance involves:

- 1) Adding new data elements
- 2) Modifying reports
- 3) Adding new reports
- 4) Changing calculation

TYPES OF MAINTENANCE:**1) Schedule Maintenance:**

Schedule maintenance is anticipated and can be planned for.

2) Rescue Maintenance:

Rescue maintenance is not anticipated but require immediate solution.

Notes:

CHAPTER-11

ENTERPRISES RESOURCE PLANNING & REDESIGNING BUSINESS

NOV-2000/NOV-2003

ERP is fully integrated business management system covering functional areas of enterprises.

ERP:

Integration of various organization processes.

ERP Promises:

- 1) One database
- 2) One application
- 3) One user interface

For the entire enterprises.

ERP CHARACTERISTICS OR EVALUATION OF ERP PACKAGES

MAY-2003

- 1) **Flexibility:** To respond to the changing need of an ORZ.
- 2) **Modular and Open:** ERP system has to have open system architecture.
- 3) **Comprehensive:** ERP should be able to support variety of ORZ function.
- 4) **Beyond the Company:** It should not confine to the ORZ boundary.
- 5) **Best Business Practices:** It must have collection of best business practice and procedure.
- 6) **New Technologies:** Combines to new technologies.

FEATURES OF ERP**MAY-2005****ERP Provides:**

- 1) Multi platform, multimode, multifacility & multicurrency
- 2) Support strategic & business planning activities
- 3) Has end to end supply chain management
- 4) Integrated information system
- 5) Increase customer service
- 6) Complete integration system
- 7) Better project management
- 8) Introduction of latest technologies- EFT/EDI
- 9) Eliminates business problem
- 10) Intelligent business tools- DSS/EIS
- 11) Bridges the information gap

BEBEFITS OF ERP**MAY-2002/NOV-2005**

- 1) Gives accounts payable.
- 2) Reduce paper documents.
- 3) Improved cost control.
- 4) Faster response and follow up customer.
- 5) More efficient cash collection.
- 6) Better monitoring

- 7) Quick responsive.
- 8) Improving the business process.
- 9) Unified customer database.
- 10) Improve international operation.

BUSINESS PROCESS REENGINEERING (BPR)

NOV-2004

BPR is the

- Fundamental rethinking and
- Radical redesign of the process,
- To achieve dramatic improvement.

Measure of performance:

Such as

- Speed
- Service
- Quality
- Cost

Dramatic results means Achieve level around 80% to 90%.

BUNINESS ENGINEERING**1) Merging of two concepts:**

- 1) Information technology
- 2) Business process reengineering (BPR)

2) Rethinking of business process:

To improve speed, quality and Output service.

- 3) Efficient redesigning of company value added chains.
- 4) Method of development of business process according to changing requirement.

STEPS ARE INVOLVED IN IMPLEMENTATION OF ERP**STEPS:**

- 1) Identifying the need.
- 2) Evaluating the AS IS situation of the business.
- 3) Deciding the desired WOULD BE situation.
- 4) Re-engineering the business process.
- 5) Evaluation of the various ERP Packages.
- 6) Finalization of ERP Packages.
- 7) Installation of Hardware and Software.
- 8) Finalizing the implementation consultants.
- 9) Implementation the guidelines.

IMPLEMENTATION OF ERP**Needs****AS IS Situation****WOULD BE Situation****Re-engineering Business Process****ERP Package Evaluation****Selection of Best ERP****H/W & S/W****Consultants****Implement**

EVALUATION OF ERP PACKAGE

Same as “features”

ENTERPRISE CONTROLLING

-Enterprise Controlling can be managed by using Integrated Enterprise Management.

-EC consists of getting accounting data prepared by subsidiaries for corporate reporting.

-Which will be automatically prepared, simultaneously with in the local book of each subsidiary.

Modules:

- 1) EC-CS
- 2) EC-PCA
- 3) EC-EIS

GUIDELINES FOR ERP IMPLEMENTATION**NOV-2003**

Which are to be followed before starting the implementation of ERP Package.

- 1) Understanding the corporate needs.
- 2) Business process redesign.
- 3) Communication network-Good system.
- 4) Leadership -Strong and effective.
- 5) Efficient & Capable Project Manager.
- 6) Creating & Balance team.
- 7) Good implementation methodology.
- 8) Training of end users.
- 9) Adopting new system.

POST IMPLEMENTATION

- 1) **Popular Expectation-** Same as benefits
- 2) **ERP-Host of Fears:-**
 - i) Job Redundancy
 - ii) Loss of Importance
 - iii) Change in Job Profile
 - iv) Loss of Control and Individual Authority
 - v) Increased Stress-Due to transparency
 - vi) ORZ fear of loss of Authority and Control.

SOME TASK AFTER IMPLEMENTATION

- 1) Develop the new job and ORZ structure.
- 2) Determine Skill Gap.
- 3) Access training requirement.
- 4) Develop and amend HR Policies.
- 5) Develop a plan for work force.

LIST OF ERP VENDORS

- 1) BAAN
- 2) SAP/R3
- 3) ORACLE
- 4) BPCS
- 5) MFG/PRO
- 6) SYSTEM 21
- 7) PRISM
- 8) MAPIC SXA (MARCOM CORP.)

CHAPTER-12

DETECTION OF COMPUTER FRAUDS

COMPUTER FRAUDS

NOV-2003

Defined as:

- 1) Any **illegal Act**
- 2) For which **knowledge** of computer is essential.
- 3) For its:
 - A) Perpetration
 - B) Investigation
 - C) Prosecution

Includes the followings:

- 1) **Unauthorized:**
 - a) Theft
 - b) Use
 - c) Access
 - d) Copying
 - e) Destruction of software data.
- 2) **Theft of money** by altering computer data.
- 3) Theft or destruction of **computer hardware**.
- 4) **Use computer** resource to commit an offence.
- 5) Intend to **illegally obtain information**.

COMPUTER FRAUD IS VERY DIFFERENT FROM CONVENTIONAL FRAUD IN A NUMBER OF IMPORTANT RESPECTS:

- 1) It is easily **hidden** and hard to detect.
- 2) **Evidence** of computer crime hard to find.
- 3) **Easily committed** in ways that:
 - A) It involves of manipulation of invisible data.
 - B) A few strokes are needed.
 - C) Business computer can be remotely accessed.
 - D) Huge amount of data can be transported disk.

PRIMARY RISK TO BUSINESS

MAY-2005

- 1) **Internal threats**
- 2) **External threats**

INTERNAL THREAT**MAY-2004****Categories of computer Frauds****1) Input:**

Simplest and most common way to **commit a fraud** is to **alter computer input**.

Example:

- 1) Collusive fraud
- 2) Disbursement fraud
- 3) Payroll fraud

2) Processor:

Computer fraud can be committed through **unauthorized system use** including the theft of computer time and services.

3) Computer instruction:

Computer fraud can be committed **by tempering** with the **software** that processes company data.

4) Data:

Computer fraud can be perpetrated **by altering or damaging companies** Data files or by copying, using or searching them with authorization.

5) Output:

With help of **stealing or misusing** system output.

6) Malicious alteration of emails:

This can be happen when an employee has a **grudge against another member of staff or management** .The effects can be troublesome, if not Damaging.

EXTERNAL THREAT

Dangers of hacking are well known, the main threat from hacking are:-

- 1) **Removal** of information
- 2) **Destruction** of system integrity
- 3) **Interference** with web pages
- 4) Transmission of **virus by E-Mails**
- 5) **Intermission** of E-Mail
- 6) Intermission of **Electronic Payments**.

INTERNET FRAUDS

MAY-2004/NOV-2004

Another major **external threat** is fraud **perpetrated over the Internet**. There are number of characteristics of the Internet, which are likely to attract fraudsters seeking to make easy money from gullible victim:

Reasons:

- 1) It is **unregulated**-No license fees, No setting up fees, No permission required.
- 2) Internet site can be **set up anywhere** in the world at low cost.
- 3) There is **no easy way of separating** the genuine from the false.
- 4) The **glamour and novelty** of Internet.
- 5) A site may be **operating outside** the legal jurisdiction of the country.

PREVENTING COMPUTER FRAUDS

A **number of measures** can significantly decrease the potential for fraud and any resulting losses.

- 1) Make **fraud less likely to occur**.
- 2) Use **proper hiring and firing** practices.
- 3) Manage **disgruntled employees**.
- 4) **Train employees** in security and fraud prevention measures.

Company should educate and train employee in the following areas:

- 1) Security measures
- 2) Telephone awareness
- 3) Fraud awareness
- 4) Ethical considerations
- 5) Punishment for unethical behaviors
- 6) Educating employees in security issue, fraud awareness.
- 7) Manage and track software licenses
- 8) Require signed confidentiality agreements

INCREASE THE DIFFICULTY OF COMMITTING FRAUD**NOV-2005**

One way to deter fraud is to design a system with sufficient controls to make fraud difficult to perpetrate. These controls help ensure the accuracy, integrity, and safety of system resources.

- 1) Develop a strong system of **internal control**.
- 2) **Segregate duties**.
- 3) Require **vacations and rotate duties**.
- 4) Restrict **access to computer equipment** and data files.
- 5) **Encrypt data** and programs.
- 6) **Protect telephone lines**.
- 7) Protect the system **from viruses**.
- 8) Control **sensitive data**.
- 9) Control **laptop computers**.

IMPROVE DETECTION METHODS**NOV-2002**

The followings steps can be taken to detect fraud as soon as possible.

- 1) Conduct frequent **Audits**
- 2) Use a computer **security officer**
- 3) Use computer **consultants**
- 4) **Monitor** system Activities
- 5) Use fraud detection **software**

REDUCE FRAUD LOSSES

Some of these methods include the following:-

- 1) **Maintain Adequate Insurance**
- 2) **Keep a Current Backup Copy**
- 3) **Develop a Contingency Plan**
- 4) **Use Special Software**

PROSECUTE AND INCARCERATE FRAUD PERPETRATORS

Most of fraud cases go unreported and unprosecuted for several reasons:

- 1) Many cases of computer fraud are as yet **undetected**.
- 2) **Public relation disaster**-False sense of security.
- 3) **Law enforcement or courts** are so busy with violent crimes.
- 4) It is **difficult, costly and time consuming** to investigate.
- 5) Lack of **computer skill** for detection of fraud.
- 6) The **sentences received** by conviction are often **very light**.

DETECTION OF COMPUTER FRAUDS

MAY-2003/MAY-2005

To **reduce the risk** to business from computer fraud, **computer forensic tools** can be used.

Disk imaging and analysis technique:

- 1) It enables the fraud investigator to **discover evidence** of transactions that the fraudster though were inaccessible or had been destroyed.
- 2) They can be used where evidence of the fraud may have been **retained in a computer**.

The stages are as follows:

- 1) Using specialist **Hardware and Software**-Copying of computer hard disk.
- 2) The **image copy of the disk** is processed.
- 3) **Analysis of the processed image**.

The software recovers the information for investigation from:-

- 1) Free Space
- 2) Lost Chain
- 3) Slack Space
- 4) Deleted File
- 5) The content of window swap files
- 6) Temporary Internet File

CHAPTER-13

INFORMATION SECURITY

Information Security:

Security relates to-

- 1) The protection of valuable Assets against:
 - a) Loss or
 - b) Disclosers or damages
- 2) Securing valuable asset from:
 - a) Threats
 - b) Sabotage or natural disaster
- 3) With physical safeguard.

Valuable Assets means Data and Information.

WHAT INFORMATION IS SENSITIVE?

The following examples highlight a few of the many factors necessary for a company to succeed.

- 1) Strategic Plans
- 2) Business Operations
- 3) Finances

Establishing better information protection:

Factors to be considered:

- A) Not all data has the same value
- B) Know where the critical data resides
- C) Develop an access control methodology
- D) Protect information stored on media
- E) Review hardcopy output

PRINCIPLE OF INFORMATION SECURITY**Eight core Principles:**

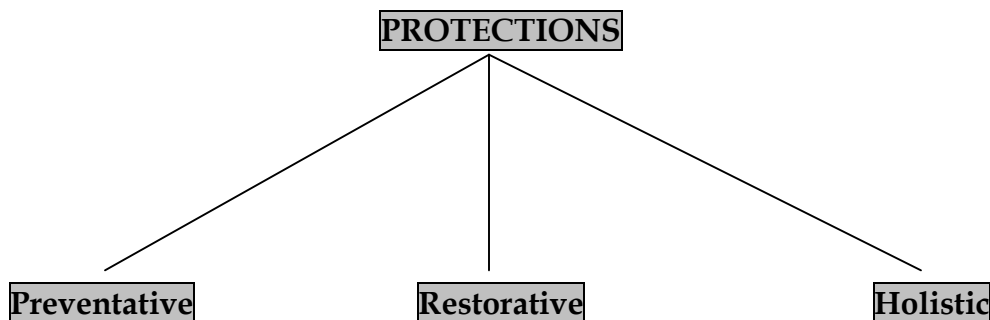
- 1) **Accountability:** Responsibility and accountability must be explicit.
- 2) **Awareness:** Regarding Risk.
- 3) **Multidisciplinary:** Both Technological and Non-Technological issues.
- 4) **Cost Effectiveness:** Security must be cost effective.
- 5) **Integration:** Security must be coordinated and integrated.
- 6) **Reassessment:** Security must be reassessed periodically.
- 7) **Timeliness:** Security Procedures must provide timely response.
- 8) **Societal Factors:** Ethics must be promoted by respecting the right of others.

ROLE OF SECURITY ADMINISTRATOR**MAY-2003**

A Security Administrator is Person-

Who is solely responsible for controlling and coordinating the activities pertaining all security aspect of the organization.

- 1) Ensure that safe from threats system.
- 2) Set Policy, subject to board approval.
- 3) Investigates, monitors, advice employees.
- 4) Guide for others user and administrators
- 5) Other functions:
 - A) Investigation all security violations
 - B) Advice senior management-Control information
 - C) Consult on the matter of information security
 - D) Conduction the security program
- 6) Prepare a list of assets and security measures.



PREVENTATIVE INFORMATION PROTECTION

This type of information is based on use of security controls:-

1) Physical :

For Exp

- a) Doors
- b) Locks
- c) Floppy Disk Lock
- d) Cable Locking
- e) CCTV
- f) Guard

2) Logical :

For Exp

- a) Password
- b) File Permission
- c) Access Control List
- d) Power Protection System

3) Administrative :

For Exp

- a) Security Awareness
- b) User Account Revocation
- c) Policy

RESTORATIVE INFORMATION PROTECTION

Key requirement is the information can be recovered with in accepted time period.

Describes the Back up system:-

- 1) Time required
- 2) Data lost
- 3) Lost data back up dated
- 4) Planning in case of data lost
- 5) Recovery plans

HOLISTIC INFORMATION PROTECTION

Protection done in such a way- Give business level of Security:

- 1) At a cost acceptable to business
- 2) One must plan for :
 - a) Unexpected
 - b) Unknown
 - c) Worst event

And recover from the event.

CHAPTER-14

AUDIT OF INFORMATION SYSTEM

PRIMARY CONCERN'S

Auditor involved in reviewing on IS should focus their concern on “**System Control Aspect**” includes total system environment.

Auditor must ensure that provisions are made for:-

- 1) An adequate Audit Trial
- 2) Control over Accounting of all data
- 3) Handling exception and rejection
- 4) Testing- System performed as stated
- 5) Control over changes
- 6) Authorization Procedure
- 7) Govt.Policies adhere or not
- 8) Training User personnel
- 9) Adequate control between Computer systems
- 10) Adequate Security Procedure
- 11) Back and Recovery Procedure
- 12) Technology-Compatible and Controlled
- 13) Database-Adequately designed

THE COMPUTER AUDITING APPROACH

Audit methods that are effective for manual audits prove ineffective in many IS audits, because of these factors: **(RENTA)**

R-Reliance on Control- Electronic evidence.

E-Electronic Evidence- Not readable in original form.

N-New risk and Controls- Threat to computer system.

T-Terminology-Tools and technique difficult for non EDP person.

A-Automated Process-Methods of processing automated.

SCOPE AND OBJECTIVE-IS AUDIT

- 1) Computerized System and Application
- 2) Information Processing Facilities
- 3) System Development
- 4) Management of Information System
- 5) Client Server, Telecommunication and Intranet.

Notes:

ROLE OF IS AUDITOR**IS auditor responsible for:-**

- i) Establishing control objective
- ii) Review the audit subject
- iii) Evaluate the results to MGT
- iv) Recommend Actions
- v) To ensure that purpose of audit fulfilled.

Objective:-

- i) Security Provision
- ii) Program Development and Acquisition
- iii) Program Modification
- iv) Processing of Transaction
- v) Source Data
- vi) Computer Data File

Note: - for detailed study refer Study Material.

CONCURRENT AUDIT TECHNIQUE

The auditor uses concurrent audit technique to:

- i) Continuously monitor the system
- ii) Collect Audit Evidences

While on line data are processed during regular operating hours.

CAT uses:

- i) Embedded audit modules
- ii) Which are segment of program code
- iii) That performs audit functions
- iv) Time Consuming and Difficult to use.

Audit Techniques:

- 1) ITF
- 2) Snapshot Technique
- 3) SCARF
- 4) Audit Hook
- 5) CIS

Note: - for detailed study refer Study Material.

CHAPTER-15

CYBER LAW AND INFORMATION TECHNOLOGY ACT

OBJECTIVE OF THE ACT

1) To Grant Legal Recognition:

- i) EDI
- ii) E-Com
- iii) Digital Signature
- iv) EFT
- v) Keeping books of accounts by bankers in electronic form

2) To Facilitate:

- i) Electronic filling of document with Govt.Dept.
- ii) Electronic storage of data

3) To Amend:

- i) IPC
- ii) Indian Evidence Act
- iii) Banker Book Evidence Act
- iv) RBI Act

SCOPES OF THE ACT

- Extend to whole of India.
- It applied also to any offence or contravention committed outside India by any person.

The act shall not apply to the following:

- i) Negotiable Instrument
- ii) Power of Attorney
- iii) A Trust
- iv) A Will
- v) Contract for sale of immovable property
- vi) Any such class of document and transaction as the CG notified.

Power of CG to make Rules {Section-10}

In respect of Digital Signature:-

- i) Type of Digital Signature
- ii) Manner and format-affixed
- iii) Manner and Procedure-for identification
- iv) Control Processes and procedure
- v) Any other matter
- vi) Security Procedure

Duties of Certifying Authorities {Section-30}

- i) Certifying authority shall follow the procedure in respect of digital signature.
- ii) Certifying authority ensure that every person employed by him complies with the provision of the act.
- iii) Display License -at a conspicuous place of business and Surrender Licence-after suspension or cancellation.
- iv) Certifying authority shall disclose its digital signature certificate.

Digital Signature Certificate {Section-35}

Granted if certifying authority is satisfied that:-

- i) The applicant holds Private Key and Public Key.
- ii) Private Key capable to creating signature.
- iii) Public Key used to verify the signature.

Suspension of Digital Signature Certificate

- i) Certifying Authority may suspend if in Public Interest.
- ii) Certificate shall not be suspended for a period exceeding 15 days unless the opportunity of being heard is given to subscriber.

Duties of Subscriber {Section 40-42}

- i) Generate the key pair
- ii) Control on key pair

Power and Procedure of the Appellate Tribunal {Section-58}

- i) Summing and enforcing the attendance of any person.
- ii) Require production of document and electronic record.
- iii) Compel him to produce evidence.
- iv) Issuing commission.

Cyber Regulation Advisory Committee

- i) CRAC shall constitute by Central Govt.
- ii) Consists the following Members:-
 - a) Chair Person
 - b) Number of official members
 - c) Number of non official members
- iii) They have special knowledge of subject matter.
- iv) Interest principally affected.
- v) Committee advice to CG for framing Rules under this Act.

Offences

Penalties:-

1) 3 Years Imprisonment and Rs.2 Lakh or Both

- i) Tempering with the computer source documents
- ii) Hacking with computer system

2) 2 Years Imprisonment and Rs.1 Lakh or Both

- i) Penalty for Misrepresentation{Section-71}
- ii) Penalty for Breach of Confidentiality{Section-72}
- iii) Penalty for Publishing false Digital Signature Certificate{Section-73}
- iv) Penalty for Fraudulent Publication{Section-74}

3)

- a) **Ist Time: 5 Years Imprisonment and Rs.1 Lakh or Both**
- b) **IInd Time: 10 Years Imprisonment and Rs.2 Lakh or Both**

- i) Publishing of information which is obscene in electronic form.