CHAPTER 01

INFORMATION SYSTEM CONCEPTS

1. BASIC CONCEPTS:

- A system includes set of components which work together to achieve certain objectives or goals.
- A system includes some inputs which undergo thorough processing to provide the required outputs.

2. TYPES OF SYSTEM:

- OPEN SYSTEM:
  - Adaptable to changes
  - Costly to develop & maintain
  - Longer life span than closed system
  - Require more maintenance than closed system
- CLOSED SYSTEM:
  - Not adaptable to changes
  - Not normally developed for business organizations
  - Easy to manage & inexpensive to develop
  - Shorter life span than open system
- DETERMINISTIC SYSTEM:
  - Provide exact output
  - Account for past data as input
- PROBABILISTIC SYSTEM:
  - Provide expected output
  - Take into account data for expected future transactions
- ABSTRACT SYSTEM:
  - Include design & drawings containing set of ideas or planning
  - Non-working system, ultimately converted into physical system
- PHYSICAL SYSTEM:
  - Includes all working system
  - Contain some physical components

3. SYSTEM CONCEPTS:

- SYSTEM BOUNDARY: It represents the periphery or limit within system components work together.

- SYSTEM ENVIRONMENT: The components outside the system boundary with which the system interacts is the system environment. System can accept inputs from & provide outputs to the environment.

- SUB-SYSTEM: Parts of a system are sub-systems. A complex system is divided into various sub-systems which help in easy development & management of the complex system.
- SUPRA-SYSTEM: it is the system immediately above the sub-system.
- SYSTEM DECOMPOSITION: It is the process of dividing the system into various subsystems. This is based on the principles that:
  - Systems should be divided into sub-systems until the overall system is easy to manage & develop
  - Every sub-system should have relevance to the main system.
- SYSTEM SIMPLIFICATION: This concept is used to divide a system into large number of sub-systems. It describes a methodology to manage the sub-systems. Here, similar subsystems are grouped together to form clusters & one cluster is linked to another to provide integrated system.
- SYSTEM STRESS: In a normal process, a supra-system provides stress / pressure to its sub-system due to change in its objectives or goals. The sub-system can adapt to these changes only if they are open-type systems and by changing their components/ rocesses.
- SYSTEM ENTROPY (or) MAINTENANCE: In order to avoid the system losing its value over time due to positive entropy (natural energy leakage), it should be provided continuously with some upgradations (negative entropy).

4. INFORMATION:

- Processed data is known as information.
- The data which has some value for its receiver is information.
- Information Systems are developed to process the data & provide information which help in decision-making process.

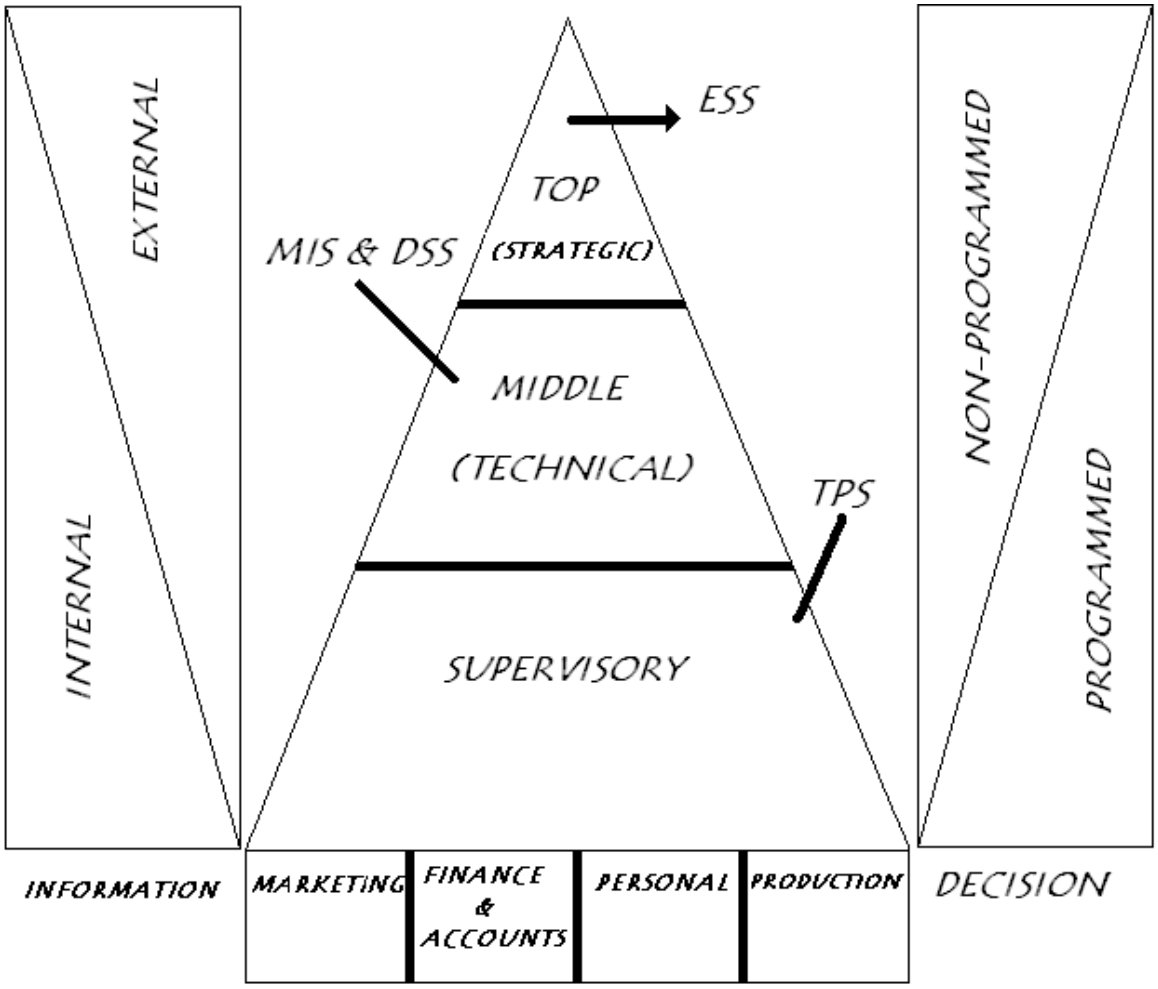
5. CHARECTERESTICS OF GOOD INFORMATION:

- Accuracy
- Timeliness
- Appropriate mode & format
- Complete & up-to-date
- Reliable source of information
- Adequate & purposeful
- May include redundancy
- Transparency
- Free from any bias
- Quality

6. FACTORS ON WHICH INFORMATION REQUIREMENTS OF EXECUTIVES DEPENDS:

- Functions of the executive: Management or Operational
- Level of the executive in the management
- Type of decision the executive wants to make

The information requirement of top executives is normally through external sources and the Information requirement of middle and supervisory management if through internal sources.



7. TYPES OF DECISIONS EXECUTIVES WANT TO MAKE:

This factor includes two analysis for deciding the information requirements of the activities:

- Program decisions
- Non-program decisions

In case of program decisions, given information is without any uncertainty, whereas in no program decisions, the information will include a factor of uncertainty.

8. INFORMATION SYSTEM & ITS ROLE IN BUSINESS:

Information System is a collection of software, hardware, data & users etc. It helps organization in efficient and effective decision making. Its key roles are:

- Provide competitive edge
- Provide efficient operation
- Provide updated information
- Helps to integrate operational functions
- Helps to achieve set strategic goals

9. VALUE / DIMENSIONS OF INFORMATION:

- **ECONOMIC DIMENSION:** information is evaluated in terms of cost & benefits. It is a difficult task due to its intangible nature but an appropriate analysis for cost incurred and benefits to be derived is performed.
- **BUSINESS DIMENSION:** the importance of information for business continuity is determined.
- **TECHNICAL DIMENSION:** Technical characteristics are evaluated in terms of security, access control & availability to user when required.

10. TYPES OF INFORMATION SYSTEM:

- Transaction Processing System
- Management Information System
- Decision Support System
- Executive Information System

11. TRANSACTION PROCESSING SYSTEM:

- TPS is used to process transactions & provide routine & regular reports.
- TPS is known as basic information system & it acts as a base to other IS like MIS & EIS.
- TPS automates the routine procedures of transaction-processing which helps to provide the required outputs in an efficient manner.
- TPS is developed using SDLC Methodology & is known as Life-cycle system.

12. COMPONENTS USED IN TPS:

- Input, used for capturing and classifying transactions
- Processing, used to process transaction as per business logics
- Storage, used to maintain the data of transactions in form of master file and transaction files
- Output, used to provide required reports from TPS. It gives 2 types of reports:
  - Operational reports
  - Financial reports

13. MANAGEMENT INFORMATION SYSTEM:

It is an extension of TPS. MIS provides some value-added reports by using operational database of TPS. It provides reports based on exceptions & mathematical sign principles which help in management decision making.

It is also based on a life cycle system & it is extensively used in various management functions.

14. CHARECTERESTICS OF A GOOD MIS:

- Management-oriented
- Management-directed
- Need-based
- Exception-based
- Integrated
- Common data flow
- Common database
- Modularity
- Comprehensive, flexible & capable of updating

15. ELEMENTS OF MIS:

- **Management:** process for planning, organizing, initiating & controlling works on information provided by MIS.
- **Information:** Processed data.
- **System:** components which work together to achieve goals.

MIS is an IS which helps in efficient decision-making by providing value-added & timely information to management for various purposes.

16. MISCONCEPTIONS ABOUT MIS:

- More data means more information
- Accuracy is highly important
- MIS means only computer-based IS
- INFORMATION SYSTEM CONCEPTS

17. PRE-REQUISITES OF MIS:

Components & activities which help to provide a quality or good MIS:

- Common database
- Expert staff
- Controls & established standards
- Maintenance
- Time to Time Evaluation

18. CONSTRAINTS IN OPERATING COMPUTER-BASED MIS:

- Non-availability of experts
- Turnover of experts
- Non-supporting staff
- Non-standardization of MIS
- Starting Trouble

19. EFFECTS OF USING COMPUTERS FOR MIS:

- Fast data processing-updated information
- Fast access of required information
- Comprehensive / detailed information
- Information acts as resource
- Helps in effective & efficient decision-making
- Wider / sensitivity analysis

20. LIMITATIONS OF MIS:

- Quality of output depends on quality of input
- MIS depends upon TPS & hence TPS limitations will be limited to MIS
- Can be used to solve only structured problems
- Provides output based on quantitative data
- Does not allow user to use judgement for problem solutions
- MIS are available as function-based MIS & this may lack tight integration among functions.
- Complex & costly process.

21. DECISION SUPPORT SYSTEM:

DSS is used for solution of semi-structured & unstructured problems. It is a pro-type system used to solve Ad-hoc problems & is user-friendly.

DSS are knowledge-based system. These systems allow its users to apply his knowledge for solution of problems by using “what-if analysis”.

22. CHARACTERiSTICS OF DSS:

- Solves both semi-structured & unstructured problems
- Used for knowledge-based system
- Sensitivity analysis
- User-friendly & graphical interface
- Can use any type of data of any structure

23. COMPONENTS OF DSS:

There are 4 major components of DSS:

- **User:** applies its knowledge for solution of problems. There are two types of users for DSS:
- **Analysts:** they normally design & develop the DSS using complex formulae & functions for a problem solution.
- **Managers:** these users have knowledge of problem to be solved & they use already created DSS for problem's solutions.
- **Planning Language:** provide GUI for structuring of problems or creating model base. They
- provide various functions & features for efficient solution of problems. There are two types of planning languages:
- **General Purpose Planning Language:** provides general functions & features to solve general purpose semi-structured or ad-hoc problems. Used for those problem's solutions which have low data volumes.
- **Special Purpose Planning Language:** used for solution of problems which have large data volume. Provides special functions & features which help to solve complex functions or procedures.
- **Model Base:** this is the most important component of DSS. It is also known as brain of DSS. It provides the structure of the problem to be solved by DSS.
- **Data Base:** this component is used to provide inputs for a DSS problem. There are 2 types of database in DSS:
- **User Database:** includes data or inputs collected by user from various sources.
- **Corporate Database:** includes data values provided by organization's operational database.

24. SOFTWARE TOOLS USED FOR CREATING DSS:

- Database software-Back end
- Model-based software-Front end
- Statistical Software-Process
- Graphical Software-Output

25. USE OF DSS IN ACCOUNTING APPLICATIONS:

- In capital budgeting applications for investment analysis
- In cost accounting problems
- General budgeting problems
- Portfolio management

26. EXECUTIVE INFORMATION SYSTEM:

- User-friendly
- Provides information for top executives
- Helps to solve complex problems without much know-how
- Timely information on monitoring organization
- Provides information on internal & external databases
- Supports online functions
- Lacks structure
- Future oriented
- Low-level details
- Internal sources

27. CHARACTERISTICS OF EIS:

- Economic environment
- External environment
- Competition environment
- Internal environment

28. PURPOSE & CONTENT OF EIS:

- Timely information of any aspect
- Provides information about problem area
- Monitoring of organization’s working