Course Title: Management Information System for Teachers and Managers

Course Code: CED 123

Course Outline

1. Management
2. Data and information: characteristic, value of information
3. Information as an aid to decision making: Intelligent stage, decision stage, choice stage and review stage
4. Concept Of System: component of a system, system boundaries, system and subsystem, output and input, subsystem interface, interface problems, system and environment
5. Information system as a subsystem
6. System approach in problems solving
7. Role and structure of information system in an organization
8. Introduction to information technology and management information system (MIS)
9. Types, functions and characteristics of MIS
10. Component of MIS: Human Resources, software, hardware, files and data bases
11. Levels of MIS
12. MIS development process
13. Needs of MIS development process and the challenges
14. Information system requirements: Information system analysis and design, technology for information system, system test planning.
15. Managing data resources
16. Management requirements
17. Decision support system (DSS): Data driven DSS, Model driven DSS, Knowledge driven DSS
18. Operational information system
19. Cognitive and behavioural aspect of MIS
20. Organizational planning and control of information system

Management

MANAGEMENT is a systematic process of planning organization, starting, leading and controlling, it is a state of activities directed at an organization resource to achieve organization goal efficiency and effectively. The basic managerial functions are: PLANNING, ORGANISATION, LEADING CONTROLLING.

These activities are undertaken by managers to combine all the resources (Human efficiency and effectively to work towards achieving the goals of the organisation

Qualities Of Management

1. It is purposeful
2. It is goal-oriented
3. It is associated with group effort
4. It can ensure better life
5. It is tangible, wherever there is management, there is a purpose.
6. It deals with the achievement of something expressed as a goal or objective
7. It exists because it is an effective means of getting the necessary work accomplished.
8. Managers focus their attention and effort on bringing about successful action.
9. They know where and when to start, what to do with keeping things moving and how to follow a goal-oriented approach.
10. Every organization entails the existence of a group of things to achieve goals
11. A manager can do much to improve the work environment, simulate people to perform better, achieve progress, bring hope and accomplish better things in life

Information as an aid to discussion making intelligent age, decision, choice stages and review

- **Intelligent stage:** It consists of discovery identifying and understanding the problems occurring in an organisation.

Feasibility study; finding out the problem

You can ask:

1. Why is there a problem?
2. Where is the problem?
3. What effect is it having on the firm?

- In the intelligence stage, decision makers identify the problem opportunities that require a decision they gather relevant information to understand the native of the problem and establish objectives. This stage involves research, gathering data analysing the data to gain insight into the situation, Decision makers seek to understand the content the scope and implication of the decision.
- **DECISION STAGE**: Decision makers evaluates alternative cause of actions base on the information gathered from the intelligence stage, they access visibility, cost, benefits, risks of each alternative. They use analytical tools or techniques to organise and analyse the information facilitating systematic evaluation of alternative. This stage involves were PROS and COM of each option to make and inform decision
- **CHOICE STAGE:** involve choosing among solution alternative. In the choice stage, decision maker final selection among the available alternative based on their evaluation in the decision stage. They consider factors such as tools used in analytical, organisation and stake holders' preference. Decision makers use information, gathered in the previous stage to justify the choice

or their choices and ensure alignment with organisational goals. This stage involves making a commitment

- **REVIEW:** In the review stage, decision makers evaluate the outcome and consequence of the cause of action. They monitor performance

SYSTEM

is a set of interrelated elements (subsystems) or parts working together to achieve a common goal. It is a set of things associated to form a complex unit

COMPONENT OF SYSTEMS:

1. **SUB-SYSTEM:** a subsystem is a smaller system that is part of a larger system. It operates within a context of a larger system and performs specific functions or task that contribute to the objectives of the system

CHARACTERISTICS OF SUB-SYSTEMS

a. Autonomy subsystem has a degree of autonomy in their operations. Autonomy enables subsystems to adapt to changing conditions handles local decision making and manage resources efficiency.
b. Interdependence: subsystem is interdependent and interconnected with each other and with a broader system. They exchange inputs, output and information with other subsystem and with the environment to coordinate their activities, (a shared of objectives or common goals).
c. Integration: subsystem is integrated into the larger system through interfaces, connections and interactions that facilitates communication and coordination.
d. Modularity: subsystems are modular in nature. It allows for flexibility scalability and reusability system design and development.

2. **BOUNDARIES:** these are the limits that identify its components, processes and interrelationships when it interfaces with another system. System interfaces are the point of interaction or communication between different components subsystems or systems

3. **ENVIRONMENT:** it refers to the external context in which subsystem operates. It supplies inputs to the system; it receives output from the system and influences the system behaviour and performance. The environment can include physical, social, economic, technological and regulatory factors

4. **INPUT AND OUTPUT**: : **Input** is the resources, data or information that enter the system from external environment to initiate its operation. Input can take various forms depending on the nature of the system inputs are essential for system to function. **Output** represents the value created by the system and are derived to the external environment or other systems. Outputs can take different forms depending on the system purpose such as goods services, report and decision.

5. **CONTROL MECHANISM**: control regulates, processes procedure that govern and manages the system procedures (operations). Control ensures that the system function within defined parameters. It includes rules, protocols, policies or automated system etc.

TYPES OF SYSTEM

a. Sub-system and super system
b. Open and close system

i. **Open and close system:** interact with their environment, adapt themselves to the changes in the environment so as to continue to their existence. A close system is a self-contained system. It does not exchange or adapt to changes with their environment
ii. **Conceptual and empirical system**: conceptual system deals with theoretical structures which major may not have any counterpart in the world. The are composed of ideals. These are systems of classification or explanation. Empirical are concretes operational

system made up of peoples, machines, materials, energy and others such systems also fall under this category of system

iii. **Permanent and temporary system**: system enduring for a long time, span in relation to the operations of humans in the system are called permanent system. temporary systems are designed of time and then to dissolve. The are important for the accomplishment of specific task.

INFORMATION SYSTEM AS A SUBSYSTEM

An information system (IS) can be defined as a set of interrelated components that collect, process, store and distribute information to support decision making and control in an organization. Information system are combination of hardware and software and telecommunications networks that people build and used to collect, create and distribute useful data typically in organizational setting.

COMPONENT OF MIS

There are five major components of a Management Information System.

- **Hardware**: is the tangible, physical portion of an information system. The part that you can touch e.g. are computer, keyboard, disk drive, and flash drive.
- **Software**: set of programs that a computer uses to execute a command
- **Data**: raw facts
- **People**: instruction givers
- **Processes**: step by step procedure taken to ensure that a goal is achieved

TYPES OF INFORMATION SYSTEM

a. Different managers, operational unit and functional areas have different information needs. That is why organisation often tailor information system to meet a particular need. Different information systems are design to support people at the operational unit or top (upper) management level

b. Transaction: most of an organizations daily activity are recorded and process by the transaction processing system which received input and convert them into output intended for the various users.
c. Structure: is made up of input, output and function. They input function include, capturing data on a source document, entering the system, check error and data validation. Output produces result. Here, we also produce paper results.
d. Storage function: every system has a data base
e. Processing function: activity for TIPS (Transaction processing system)

ACTIVITIES FOR TRANSACTION PROCESSING SYSTEM (TPS)

First, data are collected and entered into the computer via any input system. The system then processes data in one of the following ways:

- Batch processing: the firm collect data from transaction as they occur, placing them in groups or batches, the system then processes the batches periodically.
- Online processing: data are processed as soon as transaction occurs.
- Hybrid system: (a combination of both batch and online processing) collect data as they occur but process them at specified intervals

MANAGEMENT INFORMATION SYSTEM

❖ **A management information system:** (MIS) extracts data from a data base to compiles, reports such as sales analyses, inventory-level report and financial statements to help managers make routine decisions. The type and form of the report depend on the information needed by a particular manager.
❖ **Decision support system (DSS):** DSS assists managers in making semi-structured or unstructured decisions by providing analytical tools, simulations and access to relevant data. They help in evaluation alternative and accessing potential outcomes.
❖ **Executive support system (ESS):** ESS are designed to provide senior executive, (top level managers) with strategic information for long-term

planning and decision making. They often present summarized data and key performance indicators in a user-friendly format

System approach in problem solving

This is where we have;

a. Visibility study
b. System design
c. System development
d. Testing
e. Post implementation
f. Maintenance

Types of maintenance management information system

1. Human Relation (HR) system:
2. School information system:
3. Accounting and financial system
4. **Sales and marketing system**: it supports managers to execute and track effectiveness of organizations sales and marketing functions with the help of the system, the managers are able to find out which products are selling or not and how well each product is selling at each location. It includes:

- Product development
- Sales forecast
- Track and compute the advert outlet and schedule
- Management process
- Pricing and promotion
- Implement effective advertisement and sales promotion

5. **Executive information system**: Reports company data to top managers directly on an easy-to-read format.
6. **Transaction system:** Automate business process and collects data of company's daily transactional activities.

7. **Export system:** Use artificial intelligence to stimulate judgement and behavior of a person or organization with expertise and experience in a specific field.
8. **Decision support system:** It gathers information from internal and external results and helps the management to make an effective decision
9. **Inventory control system:** it tracks everything that has to do with an inventory including debits, spoilage and inventory in hand thereby allowing the management to determine which ones are selling out more and need restocking.
10. **Management report system:** it generates reports for company operation.
11. **Process control system:** it gathers data to create report based on the performance of systems and processes.

The primary function of MIS is to report the business operations to support decision making and ensure that the organization is managed and runned effectively. The functions include;

A. Provide early access to the information
B. Data collection
C. Performance tracking
D. Faster collaboration in the workspace or organization
E. Company projection

CHARACTERISTICS OF MIS

The general characteristics of an MIS are:

• Use a variety of internal data sources.

• Provide reports on the routine operations of an organization.

• Allow users to develop custom reports, such as detailed reports.

• Provide a variety of different reports, both scheduled and on demand.

• Must be accurate and avoid including estimates or probable expenses.

• Provide reports in various formats, including hard copies and electronic copies.

• The information must be relevant for making a strategic decision. Typically, an MIS is organized along the functional areas of an organization.

So, the finance department will have a financial MIS, the HR department will have a human resources MIS, etc

FEATURES OF MIS

MIS have several vital features, including:

• **Data integration**: MIS integrates data from various departments and functions, giving decision-makers a comprehensive view of the organization's data.

• **Data storage**: MIS stores vast data in databases, making it accessible and retrievable when needed.

• **Data processing**: MIS processes data to generate meaningful information. It can perform calculations, comparisons, and other data transformations to produce reports and insights.

• **User-friendly interface**: MIS systems typically have user-friendly interfaces that allow non-technical users to access and interact with data easily.

• **Customization**: MIS systems can be customized to meet an organization's needs. Users can define the type of information they want to access and how it is presented.

• **Real-time information**: Many MIS systems offer real-time or near-real-time data updates, ensuring decision-makers can access the most current information to make timely decisions.

• **Report generation**: MIS generates various reports, including standard reports, ad-hoc reports, and exception reports. These reports help managers monitor performance and make informed decisions.

• **Security**: Access to sensitive information is restricted, and measures are in place to protect data from unauthorized access or breaches.

• **Accessibility**: MIS can be accessed remotely, allowing decision-makers to retrieve information from various locations.

• **Integration with other systems**: MIS systems can integrate with other software and systems of the organization, such as ERP (Enterprise Resource Planning) systems, Customer relationship management (CRM) systems, Human capital management (HCM) systems, etc.

• **Mobile compatibility**: Many modern MIS systems are compatible with mobile devices, allowing users to access critical information on the go.

• **Data analytics**: Advanced MIS systems may incorporate data analytics and business intelligence tools to provide deeper insights and support predictive analytic

BENEFITS OF MIS

1. Allows company management access to a single database to manage all transactions and planning processes.
2. It saves time and increases work effectiveness considerably.
3. Ensures improved data analysis and decision-making.
4. Maintains an accurate record of the system's inputs and outputs and tracks employee performance.
5. Critically analyse a company's and its employee's strengths and weaknesses.
6. The CEOs or executives can take greater company financial and operational control

LIMITATIONS OF MIS

Even though MIS has many benefits, it also has its limitations, which are discussed below:

- While MIS may solve some acute problems, it is not a solution to all problems of an organization.

- Involves maintenance and employee training costs.
- It cannot meet everyone's particular demands.
- If mis designed, MIS does not serve the management and is irrelevant.
- The MIS is only good if the primary data is updated.
- Most information provided by the MIS is in quantities form. Hence, it ignores qualitative information like the behaviour of an employee

Levels of MIS

1. **Lower level**
2. **Middle level**
3. **Top level**

Management information system development process

- UI UX Design
- Software and web developers

They are two basic approaches of development of MIS

1. **Prototype**: Prototyping is the process of creating an incomplete model of a full feature system which can be used to let the user have a first idea of a computer program or allows the client to evaluate the program.

Advantages

- The designer can obtain feedback early from the user in the project development.
- The client and the contractor can compare if the development system matches with the system specifications according to the system built.
- It also gives the engineer some idea about the accuracy of the initial project estimate and whether the deadline can be successfully met
  Steps:
  a. Identify basic requirement
  b. Develop initial prototype
  c. Review
  d. Revise

Types of prototypes

i. Throw away / rapid prototype: It refers to the creation of model that will eventually be discarded rather than becoming part of the final delivered system. After the basic requirement gathering is completed, a simple working model of the system is constructed to visually show the users what their requirement may look like when they are implemented into a finished system. The most obvious reason for using this method is that it can be done quickly.
ii. Implemental prototyping: The final product is built as a separate prototype, at the end the separate prototypes are made in an overall design

Advantages of Prototypes

a. It reduces time and cost
b. It improves and

Disadvantages

a. Insufficient analysis
b. Excessive development time of the prototype
c. Expense of implementing prototyping

2. **System development Life Circle (SDLC):** The sequence of listing stages that a system goes through in its entire life. This idea in such frameworks is to understand the detail issued pertaining to concept development, requirement definition, installations, acceptance, operation, design implementation. The key characteristics is that each stage has an output that will lead to the next stage which includes the plan or process in taking the step forward. The MIS oriented SDLC is tailored to suit the requirement of business system, it has distinct stages and progressions from one stage to another. The stages include system planning or analysis. The key steps include preliminary analysis.