

Chapter 2

Conceptual Structure of MIS:

The conceptual structure of a MIS is defined as a federation of functional subsystems, each of which is divided into four major information processing components:

- Transaction processing,
- Operational control information systems support,
- Managerial control information systems support and
- Strategic planning information systems support

MIS structure based on Physical Components

A MIS is an organized system which consists of people, hardware, and communication networks and data sources that collect, transform, and distribute information in an organization. It is a tool which helps managers in making decisions by providing regular flow of accurate information in an organization.

The physical components of a MIS include hardware, software, database, personnel and procedures.

Hardware

Hardware consists of all physical components of a computer system like central processing unit (CPU), input devices, output devices, storage and communication devices.

Software

Software is an interface between the information system and users of information

system. Software can be of two types: system software and applications. The system software includes the operating system and special purpose programs. Applications are developed to achieve a specific task. Software plays an important part in MIS. Database

A database is a centrally managed and organized collection of data. Database helps to store data in an organized manner and to make it available to those who need that data. Database helps to reduce duplication of data as it is centrally managed; data on one data can be stored in one place, avoiding redundancy and duplication of data.

Procedures

Procedures are essential for effective use of an information system. Procedures consist of various instructions like user instructions, instructions for input preparation and operating instructions. These instructions help in using an information system effectively.

Personnel

Number of personnel is required for implementation of MIS like computer operators, programmers, systems analysts and managers. Human beings are key requirements for implementation of MIS. In MIS, both technical and managerial level people are required for proper implementation of MIS.

Information System processing Functions

MIS is set up by an organization with the prime objective to obtain management information to be used by its managers in decision-making. Thus, MIS must perform the following functions in order to meet its objectives.

1) Data Capturing:

MIS captures data from various internal and external sources of an organization. Data capturing may be manual or through computer terminals. End users, typically, reco

rd data about transactions on some physical medium such as paper or more enter it directly into a computer system.

2) Processing of data:

The captured data is processed to convert it into the required management information. Processing of data is done by such activities as calculating, comparing, sorting, classifying and summarizing.

3) Storage of information:

MIS stores processed or unprocessed data for future use. If any information is not immediately required, it is saved as an organizational record. In this activity, data and information are retained in an organized manner for later use. Stored data is commonly organized into fields, records, files and databases.

4) Retrieval of information:

MIS retrieves information from its stores as and when required by various users. As per the requirements of the management users, the retrieved information is either disseminated as such or it is processed again to meet the exact demands.

5) Dissemination of MI:

Management information, which is a finished product of MIS, is disseminated to the users in the organization. It could be periodic, through reports or on-line through computer terminals.

Decision Support

MANAGEMENT INFORMATION SYSTEMS SUPPORT FOR DECISION MAKING

Decisions are of different types with respect to the structure that can be provided for making them.

- Structured,

Programmable Decisions A structured decision can be said to be programmable

,in
thesensethatunambiguousdecisionrulescanbespecifiedinadvance. Whena
decisioncanbeprogrammed,anorganizationcanprepareadecisionruleor
decisionprocedure. Thiscanbeexpressedasasetofstepstofollow, aflowchart,
a
decisiontableorformula. Since,structured,programmabledecisionscanbepre
specified;manyofthesedecisionscanbehandlingbylower-level8personnelwit
h
littlespecializedknowledge. Inmanycases,itisnotpossibletodefineadecision
procedureordecisionruletohandleallpossiblesituations.

- Unstructured,
NonprogrammableDecisionsAnunstructureddecisioncanbesaidtobe
nonprogrammable. Theunstructureddecisionhasnopre-establisheddecision
procedure,eitherbecauseistooinfrequenttojustifytheorganizationalcostof
preparingadecisionprocedureorbecausethedecisionprocedureisnotundersto
od
wellenoughoristoochangeabletoallowastablepre-establisheddecisionsupport.
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LevelsofManagementActivities

MISprovidesusefulinformationtothedifferentlevelsofmanagementfordischargi
ng theirfunctionmoreeffectivelyandefficiently.

Thismeansthatthestructureofmanagementinformationcanbeexpressedinterms
ofdifferntlevelsofmanagementactivity. Therearethreimportantlevelsof
managementnamely strategicmanagement,managementcontrolortactical
managementandoperationalmanagement. Theselevelsofmanagementactivitya
re
discussedbelow.

Strategic Management

The first area of management is strategic planning level or top level management. Top level management consists of board of directors and other chief executives. They are ranking officers of the organization. Top level management develops overall organizational goals, strategies, policies and objectives through long range strategic planning. They integrate the functions of entire organization.

Strategic managers make decisions that affect the entire organization. Their decisions may also leave a long term impact in the organization. Here the decision maker develops objectives and allocates resources to attain these objectives. Decisions of this type are made over a long period of time and usually involve huge investments. Developing and introducing a new product in the market, the opening of branches abroad, mergers or acquisition etc. are some of the examples for strategic decisions.

Management Control or Tactical Management

Management control level or middle level management decisions involve financial or [personal consideration. They make wider ranging decisions for their subordinates on the basis of general guidelines received from the top level management. They develop medium range plans and defining objectives of their departments. These managers are responsible for finding the best operational measures to accomplish the strategic decisions set by the top level management.

They make plans and compare the actual performance with standards. Then they determine variances if any and take remedial measures to avoid them in future. For example if the top level manager has made decisions regarding the acquisition of hardware, software and imparting training to staff under him.

Operational Management

Operational management or lower level management deals with routine activities. They make short term plans to carry out day to day activities more effectively and efficiently. They are in charge of small groups or subordinates. These managers' implement policies handed over to them by their superiors. Within these policies, they make decisions that affect their small units for a short period. Preparation of payroll and inventory management are examples of operational control level decisions.

A comparison of different kinds of Information Systems

Using the four level pyramid model above, we can now compare how the information systems in our model differ from each other.

1. Transaction Processing Systems

What is a Transaction Processing System?

Transaction Processing Systems are operational-level systems at the bottom of the pyramid. They are usually operated directly by shop floor workers or front line staff, which provide the key data required to support the management of operations. This data is usually obtained through the automated or semi-automated tracking of low-level activities and basic transactions.

Functions of a TPS

TPS are ultimately little more than simple data processing systems.

Functions of a TPS in terms of data processing requirements

<i>Inputs</i>	<i>Processing</i>	<i>Outputs</i>
<i>Transactions Events</i>	<i>Validation Sorting Listing Merging Updating Calculation</i>	<i>Lists Detail reports Action reports Summary reports?</i>

Some examples of TPS

- *Payroll systems*
- *Order processing systems*
- *Reservations systems*
- *Stock control systems*
- *Systems for payments and fund transfers*

The role of TPS

- *Produce information for other systems*
- *Cross boundaries (internal and external)*
- *Used by operational personnel + supervisory levels*
- *Efficiency oriented*

2. Management Information Systems

What is a Management Information System?

For historical reasons, many of the different types of Information Systems found in commercial organizations are referred to as "Management Information Systems".

However, within our pyramid model, Management Information Systems are management-level systems that are used by middle managers to help ensure the smooth running of the organization in the short to medium term. The highly structured information provided by these systems allows managers to evaluate an organization's performance by comparing current with previous outputs.

Functions of a MIS

MIS are built on the data provided by the TPS

Functions of a MIS in terms of data processing requirements

<i>Inputs</i>	<i>Processing</i>	<i>Outputs</i>
<i>Internal Transactions Internal Files Structured data</i>	<i>Sorting Merging Summarizing</i>	<i>Summary reports Action reports Detailed reports</i>

Some examples of MIS

- *Sales management systems*
- *Inventory control systems*
- *Budgeting systems*
- *Management Reporting Systems (MRS)*
- *Personnel (HRM) systems*

The role of MIS

- *Based on internal information flows*
- *Support relatively structured decisions*
- *Inflexible and have little analytical capacity*
- *Used by lower and middle managerial levels*
- *Deals with the past and present rather than the future*
- *Efficiency oriented?*

3. Decision Support Systems

What is a Decision Support System?

A Decision Support System can be seen as a knowledge-based system, used by senior managers, which facilitates the creation of knowledge and allows its integration into the organization. These systems are often used to analyze existing

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structured information and allow managers to project the potential effects of their
decisions into the future. Such systems are usually interactive and are used to solve
ill-structured problems. They offer access to databases, analytical tools, allow
"what-if" simulations, and may support the exchange of information within the organization.

Functions of a DSS

DSS manipulate and build upon the information from a MIS and/or TPS to generate insights and new information.

Functions of a DSS in terms of data processing requirements

Inputs	Processing	Outputs
Internal Transactions Internal Files External Information?	Modelling Simulation Analysis Summarizing	Summary reports Forecasts Graphs/Plots

Some examples of DSS

- Group Decision Support Systems (GDSS)
- Computer Supported Co-operative work (CSCW)
- Logistic systems
- Financial Planning systems
- Spreadsheet Models?

The role of DSS

- Support ill-structured or semi-structured decisions
- Have analytical and/or modelling capacity
- Used by more senior managerial levels
- Are concerned with predicting the future
- Are effectiveness oriented?

4. Executive Information Systems

What is an EIS?

Executive Information Systems are strategic-level information systems that are found at the top of the Pyramid. They help executives and senior managers analyze the environment in which the organization operates, to identify long-term trends, and to plan appropriate courses of action. The information in such systems is often weakly structured and comes from both internal and external sources. Executive Information Systems are designed to be operated directly by executives without the need for intermediaries and are easily tailored to the preferences of the individual using them.

Functions of an EIS

EIS organizes and presents data and information from both external data sources and internal MIS or TPS in order to support and extend the inherent capabilities of senior executives.

Functions of an EIS in terms of data processing requirements

<i>Inputs</i>	<i>Processing</i>	<i>Outputs</i>
<i>External Data Internal Files Pre-defined models</i>	<i>Summarizing Simulation "Drilling Down"</i>	<i>Summary reports Forecasts Graphs/Plots</i>

Some examples of EIS

Executive Information Systems tend to be highly individualized and are often custom made for a particular client group; however, a number of off-the-shelf EIS

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packages do exist and many enterprise level systems offer a customizable EIS module.

The role of EIS

- o Are concerned with ease of use*
- o Are concerned with predicting the future*
- o Are effectiveness oriented*
- o Are highly flexible*
- o Support unstructured decisions*
- o Use internal and external data sources*
- o Used only at the most senior management levels*