

MANAGEMENT INFORMATION SYSTEM (MIS) and E-COMMERCE

UNIT-II

INFORMATION, MANAGEMENT AND DECISION MAKING

Management information systems are Computer-based databases comprised of information regarding company operations. Management and top executives can use MIS to track management performance as well as to run reports about things like productivity, efficiency, revenue, product performance, team sales and more. Many MIS systems show current performance contrasted with projected performance so that managers can tell whether they are falling behind, meeting goals or exceeding them.

The importance of MIS in decision making lies in its ability to change the direction of management teams and entire organizations. For instance, if the MIS reports show that all but one management team is exceeding the quarterly performance projections, extra help can be brought in to help the struggling team, or executives might choose to terminate and then replace the poorly performing team.

Types of Information Systems

Management information systems are used by management for decision making but by should not be confused with other information systems used by a variety of employees. Some other information systems include the following:

Decision-Support Systems:

Decision-support systems (DSS) are used by management to make organizational decisions versus the management decisions for which MIS is used. For instance, while MIS could be used to make decisions about assisting a poorly performing employee, DSS could be used by executives to create an overall shift in direction based on company and market trends.

Knowledge-Worker Systems:

Knowledge-worker systems (KWS) are used by employees who rely on knowledge for performing their basic job tasks, like company engineers, finance experts and human resources personnel. KWS systems include things like Computer-animated drawing Systems, human resources systems, financial workstations and virtual reality systems.

Office-Automation Systems:

Office-automation systems help facilitate the daily operations of an office setting and include things like the voicemail system, Word processing programs and email.

These are basic systems that are used by most employees at every level of an organization.

Executive-Support Systems:

Executive-support systems merge together MIS and DSS in order to provide top executives with the data they need to make vital decisions about the direction of the company as well as employee performance strategies.

Transactional-Processing Systems:

Transactional-processing systems (TPS) are used by Companies to fulfill purchases, orders, bill clients, track place received orders and more. When a TPS works well, and people use it as intended, it provides accurate information on inventory, sales rates, cost for materials, order fulfillment and many other details of daily operations. This information is useful to everyone, from a sales employee to middle management and top executives.

Decisions Based on Latest Information

Management information systems bring together data from inside and outside the organization. By setting up a network that links a central database to retail outlets, distributors and members of a

supply chain, companies can collect sales and production data daily, or more frequently, and make decisions based on the latest information.

Interpret Results Efficiently

Management information systems help decision-makers understand the implications of their decisions. The systems collate raw data into reports in a format that enables decision-makers to quickly identify patterns and trends that would not have been obvious in the raw data.

Decision-makers can also use management information systems to understand the potential effect of change. A sales manager, for example, can make predictions about the effect of a price change on sales by running simulations within the system and asking a number of "what if the price was" questions.

Capability to Run Scenarios

The capability to run scenarios is a key decision-making tool. Some management information systems have this feature built in, while others can provide the information required for running scenarios on other applications, such as spreadsheets. Your decision is influenced by what happens if you decide a certain way. What-if scenarios show you how different variables change when you make a decision.

You can enter reduced staff levels or increased promotion budgets and see what happens to revenue, expenses and profit for different levels of cuts or increases.

Management information systems play a critical role in making realistic Scenarios possible.

Ease of Presentation

The reporting tools within management information systems enable decision-makers to tailor reports to the information needs of other parties. If a decision requires approval by a senior executive, the decision-maker can create a brief executive summary for review. If managers want to share the detailed findings of a report with colleagues, they can create full reports and provide different levels of supplementary data.

MODELS OF DECISION MAKING

The decision-making process though a logical one is a difficult task. All decisions can be categorized into the following three basic models.

- (1) The Rational/Classical Model.
- (2) The Administrative or Bounded Rationality Model.
- (3) The Retrospective Decision-Making Model.

All models are beneficial for understanding the nature of decision-making processes in enterprises or organisations. All models are based on certain assumptions on which the decisions are taken.

1. The Rational/Classical Model:

The rational model is the first attempt to know the decision-making-process. It is considered by some as the classical approach to understand the decision-making process. The classical model gave various steps in decision-making process which have been discussed earlier.

Features of Classical Model:

1. Problems are clear.
2. Objectives are clear.
3. People agree on criteria and weights.
4. All alternatives are known.
5. All consequences can be anticipated.
6. Decision makers are rational.
 - i. They are not biased in recognizing problems.
 - ii. They are capable of processing all relevant information
 - iii. They anticipate present and future consequences of decisions.
 - iv. They search for all alternatives that maximizes the desired results.

2. Bounded Rationality Model or Administrative Man Model:

Decision-making involves the achievement of a goal. Rationality demands that the decision-maker should properly understand the alternative courses of action for reaching the goals.

He should also have full information and the ability to analyse properly various alternative courses of action in the light of goals sought. There should also be a desire to select the best solutions by selecting the alternative which will satisfy the goal achievement.

Herbert A. Simon defines rationality in terms of objective and intelligent action. It is characterised by behavioural nexus between ends and means. If appropriate means are chosen to reach desired ends the decision is rational.

Bounded Rationality model is based on the concept developed by Herbert Simon. This model does not assume individual rationality in the decision process.

Instead, it assumes that people, while they may seek the best solution, normally settle for much less, because the decisions they confront typically demand greater information, time, processing capabilities than they possess. They settle for “bounded rationality or limited rationality in decisions. This model is based on certain basic concepts.

a. Sequential Attention to alternative solution:

Normally it is the tendency for people to examine possible solution one at a time instead of identifying all possible solutions and stop searching once an acceptable (though not necessarily the best) solution is found.

b. Heuristic:

These are the assumptions that guide the search for alternatives into areas that have a high probability for yielding success.

c. Satisficing:

Herbert Simon called this “satisficing” that is picking a course of action that is satisfactory or “good enough” under the circumstances. It is the tendency for decision makers to accept the first alternative that meets their minimally acceptable requirements rather than pushing them further for an alternative that produces the best results.

Satisficing is preferred for decisions of small significance when time is the major constraint or where most of the alternatives are essentially similar.

Thus, while the rational or classic model indicates how decisions should be made (i.e. it works as a prescriptive model), it falls somewhat short concerning how decisions are actually made (i.e. as a descriptive model).

3. Retrospective decision model (implicit favourite model):

This decision-making model focuses on how decision-makers attempt to rationalise their choices after they have been made and try to justify their decisions. This model has been developed by Per Soelberg. He made an observation regarding the job choice processes of graduating business students and noted that, in many cases, the students identified implicit favorites (i.e. the alternative they wanted) very early in the recruiting and choice process. However, students continued their search for additional alternatives and quickly selected the best alternative.

The total process is designed to justify, through the guise of scientific rigor, a decision that has already been made intuitively. By this means, the individual becomes convinced that he or she is acting rationally and taking a logical, reasoned decision on an important topic.

TYPES OF INFORMATION

Types of information.

Information has its varieties. David B.Hertz and Albert B.Rubenstein have identified six varieties of information. These are as:

1. Conceptual information: Information which is based on ideas, concepts, theories, hypothesis etc, and might be used in future or not. It does not always means the actual meaning. Such information do not have scientific foundation.

- e.g. Charles Darwin’s Theory of Evaluation.

2. Empirical Information: The word empirical information denotes information acquired by means of observation or experimentation. This information have scientific foundation.

- e.g. $H_2 + O_2 = H_2O$ (Water)

3. Procedural Information: The methodology which enables the investigators to operate more effectively. Procedural information relates to means by which the data of investigation are obtained, manipulated, and tested.

- e.g. police officer > Inform to public > Reason of investigation > To find out actual criminal.

4. Stimulatory Information: Information which creates stimulation among the people are called to be the stimulatory information.

- e.g. Victory day celebration.

5. Policy Information: This type of information focuses on the decision making process. It can be obtained from description, picture, diagram etc.

- e.g. Law and Justice.

6. Descriptive information: Information which deals with providing direction is called directive information.

- e.g. Mode of operation in any organization.

TYPES OF DECISION SUPPORT SYSTEM

- **Communication-driven DSS**

Most communications-driven DSSs are targetted at internal teams, including partners. Its purpose are to help conduct a meeting, or for users to collaborate. The most common technology used to deploy the DSS is a web or client server. Examples: chats and instant messaging softwares, online collaboration and net-meeting systems.

- **Data-driven DSS**

Most data-driven DSSs are targeted at managers, staff and also product/service suppliers. It is used to query a database or data warehouse to seek specific answers for specific purposes. It is deployed via a main frame system, client/server link, or via the web. Examples: computer-based databases that have a query system to check (including the incorporation of data to add value to existing databases).

- **Document-driven DSS**

Document-driven DSSs are more common, targeted at a broad base of user groups. The purpose of such a DSS is to search web pages and find documents on a specific set of keywords or search terms. The usual technology used to set up such DSSs are via the web or a client/server system. Examples:

- **Knowledge-driven DSS:**

Knowledge-driven DSSs or 'knowledgebase' are they are known, are a catch-all category covering a broad range of systems covering users within the organization seting it up, but may also include others interacting with the organization - for example, consumers of a business. It is essentially used to provide management advice or to choose products/services. The typical deployment technology used to set up such systems could be slient/server systems, the web, or software running on stand-alone PCs.

- **Model-driven DSS**

Model-driven DSSs are complex systems that help analyse decisions or choose between different options. These are used by managers and staff members of a business, or people who interact with the organization, for a number of purposes depending on how the model is set up - scheduling, decision analyses etc. These DSSs can be deployed via software/hardware in stand-alone PCs, client/server systems, or the web.

GROUP DECISION SUPPORT SYSTEM (GDSS)

A group decision support system (GDSS) is an interactive computer-based system that facilitates a number of decision-makers (working together in a group) in finding solutions to problems that are unstructured in nature. They are designed in such a way that they take input from multiple users interacting simultaneously with the systems to arrive at a decision as a group.

The tools and techniques provided by the group decision support system improve the quality and effectiveness of the group meetings. Groupware and web-based tools for electronic meetings and

videoconferencing also support some of the group decision making processes, but their main function is to make communication possible between the decision-makers.

In a group decision support system (GDSS) electronic meeting, each participant is provided with a computer. The computers are connected to each other, to the facilitator's computer and to the file server. A projection screen is available at the front of the room. The facilitator and the participants can both project digital text and images onto this screen.

A group decision support system (GDSS) meeting comprises different phases, such as idea generation, discussion, voting, vote counting and so on. The facilitator manages and controls the execution of these phases. The use of various software tools in the meeting is also controlled by the facilitator.

Components of Group Decision Support System (GDSS)

A group decision support system (GDSS) is composed of 3 main components, namely hardware, software tools, and people.

- **Hardware:** It includes electronic hardware like the computer, equipment used for networking, electronic display boards and audiovisual equipment. It also includes the conference facility, including the physical set up – the room, the tables, and the chairs – laid out in such a manner that they can support group discussion and teamwork.
- **Software Tools:** It includes various tools and techniques, such as electronic questionnaires, electronic brainstorming tools, idea organizers, tools for setting priority, policy formation tool, etc. The use of these software tools in a group meeting helps the group decision-makers to plan, organize ideas, gather information, establish priorities, take decisions and document the meeting proceedings. As a result, meetings become more productive.
- **People:** It comprises the members participating in the meeting, a trained facilitator who helps with the proceedings of the meeting, and an expert staff to support the hardware and software. The GDSS components together provide a favorable environment for carrying out group meetings.

Features of Group Decision Support System (GDSS)

- **Ease of Use:** It consists of an interactive interface that makes working with GDSS simple and easy.
- **Better Decision Making:** It provides the conference room setting and various software tools that facilitate users at different locations to make decisions as a group resulting in better decisions.
- **Emphasis on Semi-structured and Unstructured Decisions:** It provides important information that assists middle and higher-level management in making semi-structured and unstructured decisions.
- **Specific and General Support:** The facilitator controls the different phases of the group decision support system meeting (idea generation, discussion, voting and vote counting, etc.) what is displayed on the central screen and the type of ranking and voting that takes place, etc. In addition, the facilitator also provides general support to the group and helps them to use the system.
- **Supports all Phases of the Decision Making:** It can support all the four phases of decision making, viz intelligence, design, choice, and implementation.
- **Supports Positive Group Behavior:** In a group meeting, as participants can share their ideas more openly without the fear of being criticized, they display more positive group behavior towards the subject matter of the meeting.

EXECUTIVE SUPPORT SYSTEM

Executive support systems are intended to be used by the senior managers directly to provide support to non-programmed decisions in strategic management.

These information are often external, unstructured and even uncertain. Exact scope and context of such information is often not known beforehand.

This information is intelligence based –

- Market intelligence
- Investment intelligence
- Technology intelligence

Examples of Intelligent Information

Following are some examples of intelligent information, which is often the source of an ESS –

- External databases
- Technology reports like patent records etc.
- Technical reports from consultants
- Market reports
- Confidential information about competitors
- Speculative information like market conditions
- Government policies
- Financial reports and information

Features of Executive Information System

1) Drill-Down Capabilities :

This helps the executive to get the details from particular information, e.g., drop in corporate sales in a particular region. In systems that use graphical user interface, hypertext-style connections are used for information gathering. In menu-driven systems, sub-menus are used to access the detailed information at each level.

2) Designed with Management's Critical Success Factors In Mind :

Each company has its own critical aspects to achieve the organisational objectives. These aspects can be at the individual, departmental and organisational level.

3) Status Access, Trend Analysis and Exception Reporting :

This permits executives to get the recent data on any key variable. Trend analysis supports the executive to study data over a given timeline. Hence, timing and significance of information are too crucial. Permission to highlight deviations from the established norm in the organisation is allowed in case of exception reporting, which also include reason of deviation.

4) Personalized Analysis :

Built-in functions are used to examine problematic situations in EIS. With the help of these functions, executives become capable to specify the data required for the analysis and the format type (in which results are displayed) of results.

5) Navigation of Information :

This allows access of large amounts of data in a very short time span with accurate results. Forward and backward path access, skipping screens while accessing a selected part of the system are the examples of it.

Advantages of ESS

- Easy for upper level executive to use
- Ability to analyze trends
- Augmentation of managers' leadership capabilities
- Enhance personal thinking and decision-making
- Contribution to strategic control flexibility
- Enhance organizational competitiveness in the market place
- Instruments of change
- Increased executive time horizons.
- Better reporting system
- Improved mental model of business executive
- Help improve consensus building and communication
- Improve office automation
- Reduce time for finding information
- Early identification of company performance
- Detail examination of critical success factor
- Better understanding
- Time management
- Increased communication capacity and quality

Disadvantage of ESS

- Functions are limited
- Hard to quantify benefits
- Executive may encounter information overload
- System may become slow
- Difficult to keep current data
- May lead to less reliable and insecure data
- Excessive cost for small company