
Management Information Systems

Management information systems (MIS) designates a specific category of information systems serving management-level functions. Typically, MIS have large quantities of input data and they produce summary reports as output. MIS are oriented almost exclusively to internal, not environmental or external, events.

MIS primarily serve the functions of **planning, controlling, and decision making** at the management level. Generally, they depend on underlying transaction processing systems for their data. MIS summarize and report on the company's basic operations.

MIS converts TPS data into information for monitoring performance and managing an organization. Transactions recorded in a TPS are analyzed and reported by an MIS. Management information systems serve the management level of the organization, providing managers with reports and often online access to the organization's current performance and historical records. The basic transaction data from TPS are compressed and are usually presented in long reports that are produced on a regular schedule. Figure (24) shows how a typical MIS transforms transaction level data from inventory, production, and accounting into MIS files that are used to provide managers with reports. In the system illustrated by this diagram, three TPS supply summarized transaction data to the MIS reporting system at the end of the time period. Managers gain access to the organizational data through the MIS, which provides them with the appropriate reports.

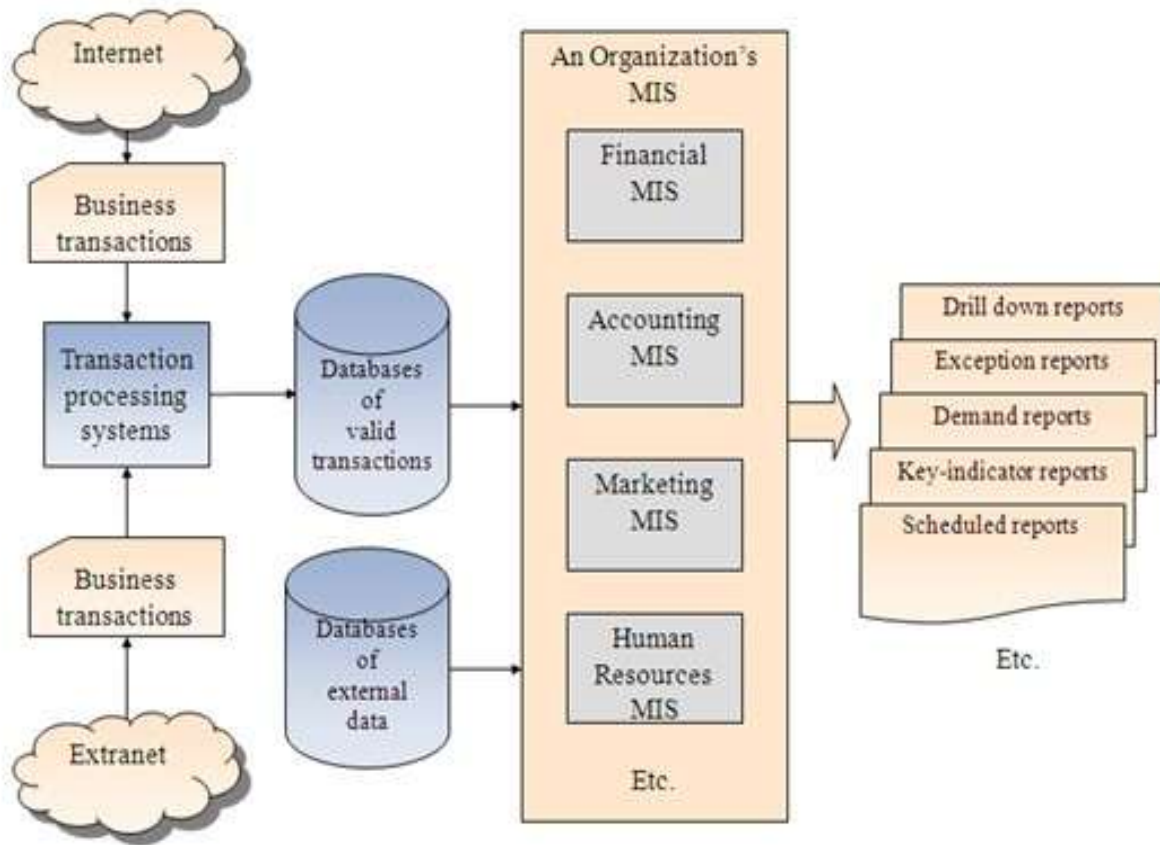


Figure 24: How MIS's obtain their data from the organization's TPS

MIS usually serve managers primarily interested in weekly, monthly, and yearly results, although some MIS enable managers to drill down to see daily or hourly data if required. MIS generally provide answers to routine questions that have been specified in advance and have a predefined procedure for answering them. For instance, MIS reports might compare total annual sales figures for specific products to planned targets as shown in Table 6. These systems are generally not flexible and have little analytical capability. Most MIS use simple routines such as summaries and comparisons, as opposed to sophisticated mathematical models or statistical techniques.

Table 5: Functions of MIS

Functions of a MIS in terms of data processing requirements		
Inputs	Processing	Outputs
Internal Transactions	Sorting	Summary reports
Internal Files	Merging	Action reports
Structured data	Summarizing	Detailed reports

Table 6: A sample MIS report

PRODUCT CODE	PRODUCT DESCRIPTION	SALES REGION	ACTUAL SALES	PLANNED	ACTUAL versus PLANNED
4469	Carpet Cleaner	Northeast	4,066,700	4,800,000	0.85
		South	3,778,112	3,750,000	1.01
		Midwest	4,867,001	4,600,000	1.06
		West	4,003,440	4,400,000	0.91
	TOTAL		16,715,253	17,550,000	0.95
5674	Room Freshener	Northeast	3,676,700	3,900,000	0.94
		South	5,608,112	4,700,000	1.19
		Midwest	4,711,001	4,200,000	1.12
		West	4,563,440	4,900,000	0.93
	TOTAL		18,559,253	17,700,000	1.05

Decision-Making in Modern Organizations

The word "decision" is derived from the Latin root "decido"; which means 'to cut off'. The concept of decision, therefore, is settlement, a fixed intention bringing to a conclusive result, a judgment, and a resolution.

Individuals throughout organizations use the information they gather to make a wide range of decisions. These decisions may affect the lives of others and change the course of an organization. A decision is the choice out of several options made by the decision maker to achieve some objective in a given situation.

Decision Making Concepts

Much of managerial work is decision making. Managers often have to consider large amounts of data, synthesis from them only relevant information and make decisions that will best benefit the organization. Hence, information should be conceived and able to prove their value as information system should support and assist effective decision-making.

Because of the importance of high-quality decision making, firms are investing heavily in decision making and intelligence systems, which consist of technologies and applications designed to help users make better decisions. When we think of intelligence as applied to humans, we typically think of people's ability to combine learned knowledge with new information and change their behavior in such a way that they succeed at their task or adapt to a new situation.

The decision-making process is a complex process in the higher hierarchy of management. The complexity is the result of many factors, such as the

interrelationship among the experts or decision makers, a job responsibility, a question of feasibility, the codes of morals and ethics, and a probable impact on business.

The personal values of the decision maker play a major role in decision-making. A decision otherwise being very sound on the business principle and economic rationality may be rejected on the basis of the personal values, which are defeated if such a decision is implemented. The culture, the discipline and the individual's commitment to goals will decide the process and success of the decision.

Whatever may be the situation, if one analyses the factors underlying the decision-making process, it would be observed that there are common characteristics in each of them. There is a definite method of arriving at a decision; And it can be put in the form of decision process model.

The decision-making process requires creativity, imagination and a deep understanding of human behavior. The process covers a number of tangible and intangible factors affecting the decision-making process. It also requires a foresight to predict the post decision implications and a willingness to face those implications. All decisions solve a "problem" but over a period of time they give rise to a number of other problems.

Types of Decisions

- **Structured decisions** follow a set of rules. This means that: decisions can be taken objectively there is a clearly defined method of solving the problem generally, there is a right answer. There are a number of operational

research techniques to help reach structured decisions. These include linear programming and network analysis.

- **Unstructured decisions** are normally subjective and do not follow any definite set of rules. (Efforts are made to turn unstructured decisions into structured ones by setting hard-and-fast criteria.).
- **Semi-structured decisions** lie between structured and unstructured decisions. Some parts of the decision making process are programmable (structured), others not.

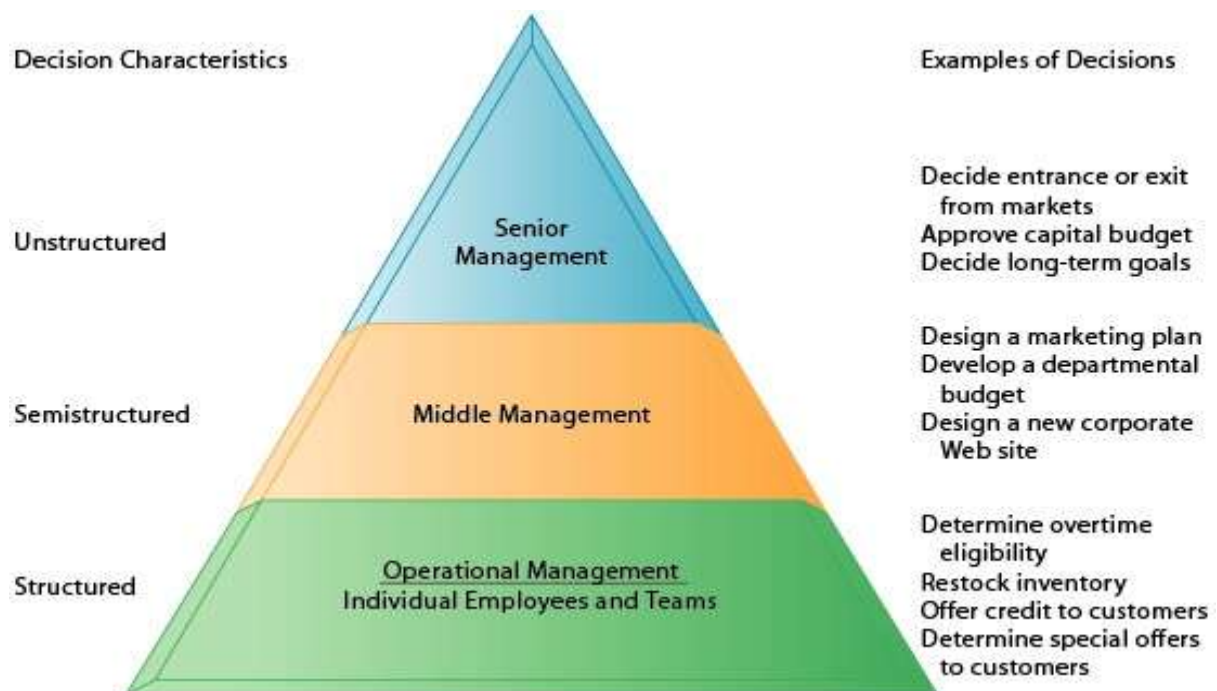


Figure 25: Information Requirements of Decision-Making inside organization

There are different types of decision-making at different levels; senior executives face many unstructured decision situations, such as establishing the firm's five or ten-year goals. Middle management faces more structured decision scenarios but their decisions may include unstructured components.

Operational management and rank-and-file employees tend to make more structured decisions.

Table 7: Examples of Decisions Commonly Made Within Organizations

<i>Level of Decision</i>	<i>Examples of Decision</i>	<i>Who Typically Makes Decisions</i>
Strategic Decisions	Should we merge with another company? Should we pursue a new product line? Should we downsize our organization?	Top Management Teams, CEOs, and Boards of Directors
Tactical Decisions	What should we do to help facilitate employees from the two companies working together? How should we market the new product line? Who should be let go when we downsize?	Managers
Operational Decisions	How often should I communicate with my new coworkers? What should I say to customers about our new product? How will I balance my new work demands?	Employees throughout the organization

Other types of decisions are:-

Analytical decisions: An analytical decision is one that is based on an analysis of information that has been systematically acquired and evaluated. Much of the information will be quantitative.

Heuristic decisions: These solutions will usually depend on trial and error. Common sense, past experience and general guidelines may be used to help, but the decision maker is not applying any techniques that will guarantee the correct answer first time.

Generally, not all decisions have major consequences or even require a lot of thought. For example, before you come to class, you make simple and habitual decisions such as what to wear, what to eat, and which route to take as you go to and from home and school. You probably do not spend much time on these mundane decisions. These types of straightforward decisions are termed *programmed decisions*, or decisions that occur frequently enough that we develop an automated response to them. The automated response we use to make these decisions is called the decision rule. For example, many restaurants face customer complaints as a routine part of doing business. Because complaints are a recurring problem, responding to them may become a programmed decision. The restaurant might enact a policy stating that every time they receive a valid customer complaint, the customer should receive a free dessert, which represents a decision rule.

On the other hand, unique and important decisions require conscious thinking, information gathering, and careful consideration of alternatives. These are called *non-programmed decisions*. For example, in 2007 McDonald's Corporation became aware of the need to respond to growing customer concerns regarding the unhealthy aspects (high in fat and calories) of the food they sell. This is a non-programmed decision, because for several decades, customers of fast-food restaurants were more concerned with the

taste and price of the food, rather than its healthiness. In response to this problem, McDonald's decided to offer healthier alternatives such as the choice to substitute French fries in Happy Meals with apple slices and later they banned the use of trans fat at their restaurants.

Decision makers have to choose among the policies that contain various mixes of conflicting goals. This is especially evident in the strategic level. As a result, decision-making systems are useful to assist this situation. The decision making process can be broken down into five stages, namely:-

1. **Trigger:** (find what to fix): Find or recognize a problem, need, or opportunity (also called the diagnostic phase of decision making). This phase involves detecting and interpreting signs that indicate a situation which needs your attention. These "signs" come in many forms: consistent customer requests for new-product features, the threat of new competition, declining sales, rising costs, an offer from a company to handle your distribution needs, and so on.
2. **Information gathering:** Identifies preliminary information needs; obtain information.
3. **Design:** (find fixes): Consider possible ways of solving the problem, filling the need, or taking advantage of the opportunity. In this phase, you develop all the possible solutions you can.
4. **Choice:** (pick a fix): Examine and weigh the merits of each solution, estimate the consequences of each, and choose the best one (which may be to do nothing at all). The "best" solution may depend on such factors as cost, ease of implementation, staffing requirements, and timing. This is the

prescriptive phase of decision making—it's the stage at which a course of action is prescribed.

5. **Evaluation:** (apply the fix): Carry out the chosen solution, monitor the results, and make adjustments as necessary. Simply implementing a solution is seldom enough. Your chosen solution will always need fine-tuning, especially for complex problems or changing environments.

This five-phase process is not necessarily linear: You'll often find it useful or necessary to cycle back to an earlier phase. When choosing an alternative in the choice phase, for example, you might become aware of another possible solution. Then you would go back to the design phase, include the newly found solution, return to the choice phase, and compare the new solution to the others you generated.



Figure 26: Decision making process phases

