**UNIT-2**

**DSS (Decision Support System)**

Decision support systems (DSS) are interactive software-based systems intended to help managers in decision-making by accessing large volumes of information generated from various related information systems involved in organizational business processes, such as office automation system, transaction processing system, etc.

DSS uses the summary information, exceptions, patterns, and trends using the analytical models. A decision support system helps in decision-making but does not necessarily give a decision itself. The decision makers compile useful information from raw data, documents, personal knowledge, and/or business models to identify and solve problems and make decisions.

There are two types of decision making used in [MIS](https://en.wikipedia.org/wiki/Management_information_system). They are

1. Structured decisions.

2. Unstructured decisions.

* **Structured decisions:**Structured decisions are those that can be programmed. These decisions can be taken objectively. They are essentially repetitive, routine and involve a definite procedure for handling them. Herbert A. Simon termed structured decisions as programmed decisions. Programmed decisions are in fact those that are made in accordance with some policy, rule or procedure so that they do not have to be handled de novo each time they occur. It is for these reasons that such managerial problems are relegated to the supervisory level.

* **Unstructured decisions:**Unstructured decisions are those in which the decision maker must provide judgment, evaluation and insights into the problem definition. These decisions must be taken subjectively. Unstructured decisions are more respectively in nature, usually one-sort occurrences for which standard responses are usually not available. Hence, they require a creative process of problem-solving which is specially tailored to meet the requirement of situation on hand. In fact manager at higher level in an organisation are usually faced with more such unstructured decision making situation. Some have aptly descried the situation as somewhat strategic in nature as compare to the tactical orientation of the structured decision at lower level of management. Strategic decisions are non-respective, vital and important and aim at determining or changing the ends or means of enterprise.

Decision support systems generally involve non-programmed decisions. Therefore, there will be no exact report, content, or format for these systems. Reports are generated on the fly.

**DECISION-MAKING LEVELS**

The four different decision-making constituencies in a firm are the following:

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FIGURE: Information requirements of key decision-making groups  
Various levels of management in the firm have differing information requirements for decision support because of their different job responsibilities and the nature of the decisions made at each level.

* **Senior management.** Senior management is concerned with general yet timely information on changes in the industry and society at large that may affect both the long-term and near-term future of the firm, the firm’s strategic goals, short-term and future performance, specific bottlenecks and trouble affecting operational capabilities, and the overall ability of the firm to achieve its objectives.
* **Middle management and project teams.** Middle management is concerned with specific, timely information about firm performance, including revenue and cost reduction targets, and with developing plans and budgets to meet strategic goals established by senior management. This group needs to make important decisions about allocating resources, developing short-range plans, and monitoring the performance of departments, task forces, teams, and special project groups. Often the work of middle managers is accomplished in teams or small groups of managers working on a task.
* **Operational management and project teams.** Operational management monitors the performance of each subunit of the firm and manages individual employees. Operational managers are in charge of specific projects and allocate resources within the project budget, establish schedules, and make personnel decisions. Operational work may also be accomplished through teams.
* **Individual employees.** Employees try to fulfil the objectives of managers above them, following established rules and procedures for their routine activities. Increasingly, however, employees are granted much broader responsibilities and decision-making authority based on their own best judgment and information in corporate systems. Employees may be making decisions about specific vendors, customers, and other employees. Because employees interact directly with the public, how well they make their decisions can directly impact the firm’s revenue streams.

**Attributes of a DSS**

* Adaptability and flexibility
* High level of Interactivity
* Ease of use
* Efficiency and effectiveness
* Complete control by decision-makers
* Ease of development
* Extendibility
* Support for modeling and analysis
* Support for data access
* Standalone, integrated, and Web-based

**Characteristics of a DSS**

* Support for decision-makers in semi-structured and unstructured problems.
* Support for managers at various managerial levels, ranging from top executive to line managers.
* Support for individuals and groups. Less structured problems often requires the involvement of several individuals from different departments and organization level.
* Support for interdependent or sequential decisions.
* Support for intelligence, design, choice, and implementation.
* Support for variety of decision processes and styles.
* DSSs are adaptive over time.

**Benefits of DSS**

* Improves efficiency and speed of decision-making activities.
* Increases the control, competitiveness and capability of futuristic decision-making of the organization.
* Facilitates interpersonal communication.
* Encourages learning or training.
* Since it is mostly used in non-programmed decisions, it reveals new approaches and sets up new evidences for an unusual decision.
* Helps automate managerial processes.

**Components of a DSS**

Following are the components of the Decision Support System −

* **Database Management System (DBMS)** − To solve a problem the necessary data may come from internal or external database. In an organization, internal data are generated by a system such as TPS and MIS. External data come from a variety of sources such as newspapers, online data services, databases (financial, marketing, human resources).
* **Model Management System** − It stores and accesses models that managers use to make decisions. Such models are used for designing manufacturing facility, analyzing the financial health of an organization, forecasting demand of a product or service, etc.

**Support Tools** − Support tools like online help; pulls down menus, user interfaces, graphical analysis, error correction mechanism, facilitates the user interactions with the system.

**Classification of DSS**

There are several ways to classify DSS. Hoi Apple and Whinstone classifies DSS as follows −

* **Text Oriented DSS** − It contains textually represented information that could have a bearing on decision. It allows documents to be electronically created, revised and viewed as needed.
* **Database Oriented DSS** − Database plays a major role here; it contains organized and highly structured data.
* **Spreadsheet Oriented DSS** − It contains information in spread sheets that allows create, view, modify procedural knowledge and also instructs the system to execute self-contained instructions. The most popular tool is Excel and Lotus 1-2-3.
* **Solver Oriented DSS** − It is based on a solver, which is an algorithm or procedure written for performing certain calculations and particular program type.
* **Rules Oriented DSS** − It follows certain procedures adopted as rules.
* **Rules Oriented DSS** − Procedures are adopted in rules oriented DSS. Export system is the example.
* **Compound DSS** − It is built by using two or more of the five structures explained above.

**Types of DSS**

Following are some typical DSSs −

* **Status Inquiry System** − It helps in taking operational, management level, or middle level management decisions, for example daily schedules of jobs to machines or machines to operators.
* **Data Analysis System** − It needs comparative analysis and makes use of formula or an algorithm, for example cash flow analysis, inventory analysis etc.
* **Information Analysis System** − In this system data is analyzed and the information report is generated. For example, sales analysis, accounts receivable systems, market analysis etc.
* **Accounting System** − It keeps track of accounting and finance related information, for example, final account, accounts receivables, accounts payables, etc. that keep track of the major aspects of the business.
* **Model Based System** − Simulation models or optimization models used for decision-making are used infrequently and creates general guidelines for operation or management.

**Advantages of a Decision Support System**

* A decision support system increases the speed and efficiency of decision-making activities. It is possible, as a DSS can collect and analyze real-time data.
* It promotes training within the organization, as specific skills must be developed to implement and run a DSS within an organization.
* It automates monotonous managerial processes, which means more of the manager’s time can be spent on decision-making.
* It improves [interpersonal communication](https://corporatefinanceinstitute.com/resources/careers/soft-skills/communication/) within the organization.

**Disadvantages of a Decision Support System**

* The cost to develop and implement a DSS is a huge capital investment, which makes it less accessible to smaller organizations.
* A company can develop a dependence on a DSS, as it is integrated into daily decision-making processes to improve efficiency and speed. However, managers tend to rely on the system too much, which takes away the subjectivity aspect of decision-making.
* A DSS may lead to [information overload](https://www.forbes.com/sites/laurashin/2014/11/14/10-steps-to-conquering-information-overload/) because an information system tends to consider all aspects of a problem. It creates a dilemma for end-users, as they are left with multiple choices.
* Implementation of a DSS can cause fear and backlash from lower-level employees. Many of them are not comfortable with new technology and are afraid of losing their jobs to technology.

**Decision Making Process**

## Introduction

Decision making is a daily activity for any human being. There is no exception about that. When it comes to business organizations, decision making is a habit and a process as well.

Effective and successful decisions make profit to the company and unsuccessful ones make losses. Therefore, corporate decision making process is the most critical process in any organization.

In the decision making process, we choose one course of action from a few possible alternatives. In the process of decision making, we may use many tools, techniques and perceptions.

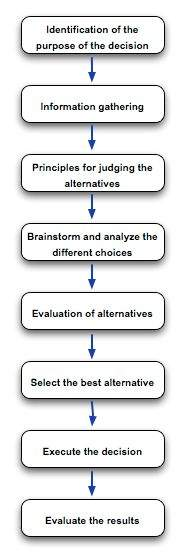
In addition, we may make our own private decisions or may prefer a collective decision.

Usually, decision making is hard. Majority of corporate decisions involve some level of dissatisfaction or conflict with another party.

Let's have a look at the decision making process in detail.

## Steps of Decision Making Process

Following are the important steps of the decision making process. Each step may be supported by different tools and techniques.



### **Step 1: Identification of the purpose of the decision**

In this step, the problem is thoroughly analysed. There are a couple of questions one should ask when it comes to identifying the purpose of the decision.

* What exactly is the problem?
* Why the problem should be solved?
* Who are the affected parties of the problem?
* Does the problem have a deadline or a specific time-line?

### **Step 2: Information gathering**

A problem of an organization will have many stakeholders. In addition, there can be dozens of factors involved and affected by the problem.

In the process of solving the problem, you will have to gather as much as information related to the factors and stakeholders involved in the problem. For the process of information gathering, tools such as 'Check Sheets' can be effectively used.

### **Step 3: Principles for judging the alternatives**

In this step, the baseline criteria for judging the alternatives should be set up. When it comes to defining the criteria, organizational goals as well as the corporate culture should be taken into consideration.

As an example, profit is one of the main concerns in every decision making process. Companies usually do not make decisions that reduce profits, unless it is an exceptional case. Likewise, baseline principles should be identified related to the problem in hand.

### **Step 4: Brainstorm and analyse the different choices**

For this step, brainstorming to list down all the ideas is the best option. Before the idea generation step, it is vital to understand the causes of the problem and prioritization of causes.

For this, you can make use of Cause-and-Effect diagrams and Pareto Chart tool. Cause-and-Effect diagram helps you to identify all possible causes of the problem and Pareto chart helps you to prioritize and identify the causes with highest effect.

Then, you can move on generating all possible solutions (alternatives) for the problem in hand.

### **Step 5: Evaluation of alternatives**

Use your judgement principles and decision-making criteria to evaluate each alternative. In this step, experience and effectiveness of the judgement principles come into play. You need to compare each alternative for their positives and negatives.

### **Step 6: Select the best alternative**

Once you go through from Step 1 to Step 5, this step is easy. In addition, the selection of the best alternative is an informed decision since you have already followed a methodology to derive and select the best alternative.

### **Step 7: Execute the decision**

Convert your decision into a plan or a sequence of activities. Execute your plan by yourself or with the help of subordinates.

### **Step 8: Evaluate the results**

Evaluate the outcome of your decision. See whether there is anything you should learn and then correct in future decision making. This is one of the best practices that will improve your decision-making skills.

**Decision-Making Model:**

A decision-making model is a system or process which individuals can follow or imitate to ensure they make the best choice among various options. A model makes the decision-making process easier by providing guidelines to help businesses reach a beneficial conclusion.

Decision models also make the decision-making process visible and easily communicable for everyone involved, including all managers, stakeholders and employees. They can be used for a wide variety of purposes across departments, businesses and industries, but they are especially useful when selecting software vendors or new tools, choosing new courses of action or when implementing changes that effect large amounts of people.

**Types of decision-making models**

Common types of decision-making models include:

**Rational models.**Rational decision-making is the most popular type of model. It is logical and sequential and focuses on listing as many alternative courses of action as possible. Once all options have been laid out, they can be evaluated to determine which is best. These models often include pros and cons for each choice, with the options listed in the order of their importance.

A rational decision-making model typically includes the following steps:

Identify the problem or opportunity.

Establish and weigh decision criteria.

Collect and organize all related information.

Analyze the situation.

Develop a variety of options.

Assess all options and assign a value to each one.

Decide which option is best.

Implement the decision.

Evaluate the decision.

**Intuitive models.**These decision-making models focus on there being no real logic or reason to the decision-making process. Instead, the process is dictated by an inner knowledge -- or intuition -- about what the right option is. However, intuitive models are not solely based on gut feelings. They also look at [pattern recognition](https://www.techtarget.com/whatis/definition/pattern-recognition), similarity recognition and the importance or prominence of the option.

**Recognition primed models.**These models are a combination of rational and intuitive decision-making. Its defining element is that the decision maker only considers one option instead of weighing all of them.

The recognition primed decision-making process involves:

Identifying the problem, including all its characteristics, problem cues, expectations and business goals.

Thinking through the plan and performing a mental simulation to see if it works and what modifications might be needed.

If the plan seems satisfactory, then the final decision is made, and the plan is implemented.

In recognition primed models, alternative courses of action are only considered if the original plan does not produce the intended results. The success rate of this model correlates to an individual's experience and expertise.

**Creative models.**In this decision-making model, users collect information and insights about the problem and create some initial ideas for solutions. Then, the decision maker enters an incubation period where they do not actively think about the options. Instead, they allow their unconscious to take over the process and eventually lead them to a realization and answer which they can then test and finalize.