MIS - MANAGERIAL DECISION-MAKING

Concept of Decision-Making

Decision-making is a cognitive process that results in the selection of a course of action among several alternative scenarios.

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 result in profits, while unsuccessful ones cause losses. Therefore, corporate decision-making is the most critical process in any organization.

In a 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.

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 analyzed. 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 Analyze the 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 the highest effect.

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

Step 5: Evaluation of Alternatives

Use your judgment principles and decision-making criteria to evaluate each alternative. In this step, experience and effectiveness of the judgment 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.

Process and Modeling in Decision-Making

There are two basic models in decision-making:

- Rational models
- Normative model

The rational models are based on cognitive judgments and help in selecting the most logical and sensible alternative. Examples of such models include: decision matrix analysis, Pugh matrix, SWOT analysis, Pareto analysis and decision trees, selection matrix, etc.

A rational decision making model takes the following steps:

- Identifying the problem,
- Identifying the important criteria for the process and the result,
- Considering all possible solutions,
- Calculating the consequences of all solutions and comparing the probability of satisfying the criteria,
- Selecting the best option.

The normative model of decision-making considers constraints that may arise in making decisions, such as time, complexity, uncertainty, and inadequacy of resources.

According to this model, decision-making is characterized by:

- Limited information processing - A person can manage only a limited amount of information.
- Judgmental heuristics - A person may use shortcuts to simplify the decision making process.
- Satisficing - A person may choose a solution that is just "good enough".

Dynamic Decision-Making

Dynamic decision-making *DDM* is synergetic decision-making involving interdependent systems, in an environment that changes over time either due to the previous actions of the decision-maker or due to events that are outside of the control of the decision-maker.

These decision-makings are more complex and real-time.

Dynamic decision-making involves observing how people used their experience to control the system's dynamics and noting down the best decisions taken thereon.

Sensitivity Analysis

Sensitivity analysis is a technique used for distributing the uncertainty in the output of a mathematical model or a system to different sources of uncertainty in its inputs.

From business decision perspective, the sensitivity analysis helps an analyst to identify cost drivers as well as other quantities to make an informed decision. If a particular quantity has no bearing on a decision or prediction, then the conditions relating to quantity could be eliminated, thus simplifying the decision making process.

Sensitivity analysis also helps in some other situations, like:

- Resource optimization
- Future data collections
- Identifying critical assumptions

- To optimize the tolerance of manufactured parts

Static and Dynamic Models

Static models:

- Show the value of various attributes in a balanced system.
- Work best in static systems.
- Do not take into consideration the time-based variances.
- Do not work well in real-time systems however, it may work in a dynamic system being in equilibrium
- Involve less data.
- Are easy to analyze.
- Produce faster results.

Dynamic models:

- Consider the change in data values over time.
- Consider effect of system behavior over time.
- Re-calculate equations as time changes.
- Can be applied only in dynamic systems.

Simulation Techniques

Simulation is a technique that imitates the operation of a real-world process or system over time. Simulation techniques can be used to assist management decision making, where analytical methods are either not available or cannot be applied.

Some of the typical business problem areas where simulation techniques are used are:

- Inventory control
- Queuing problem
- Production planning

Operations Research Techniques

Operational Research *OR* includes a wide range of problem-solving techniques involving various advanced analytical models and methods applied. It helps in efficient and improved decision-making.

It encompasses techniques such as simulation, mathematical optimization, queuing theory, stochastic-process models, econometric methods, data envelopment analysis, neural networks, expert systems, decision analysis, and the analytic hierarchy process.

OR techniques describe a system by constructing its mathematical models.

Heuristic Programming

Heuristic programming refers to a branch of artificial intelligence. It consists of programs that are self-learning in nature.

However, these programs are not optimal in nature, as they are experience-based techniques for problem solving.

Most basic heuristic programs would be based on pure 'trial-error' methods.

Heuristics take a 'guess' approach to problem solving, yielding a 'good enough' answer, rather

than finding a 'best possible' solution.

Group Decision-Making

In group decision-making, various individuals in a group take part in collaborative decision-making.

Group Decision Support System *GDSS* is a decision support system that provides support in decision making by a group of people. It facilitates the free flow and exchange of ideas and information among the group members. Decisions are made with a higher degree of consensus and agreement resulting in a dramatically higher likelihood of implementation.

Following are the available types of computer based GDSSs:

- **Decision Network:** This type helps the participants to communicate with each other through a network or through a central database. Application software may use commonly shared models to provide support.
- **Decision Room:** Participants are located at one place, i.e. the decision room. The purpose of this is to enhance participant's interactions and decision-making within a fixed period of time using a facilitator.
- **Teleconferencing:** Groups are composed of members or sub groups that are geographically dispersed; teleconferencing provides interactive connection between two or more decision rooms. This interaction will involve transmission of computerized and audio visual information.