

ENHANCE THE MANAGERIAL PLANNING USING PROBABILITY BASED DECISION TREE

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Abstract: Managerial Planning is the most basic function of management. The important activity of planning is forecasting of business, market trend, commodity trends and other functions which affect performance. Planning is the function that determines in advance what should be done. It is a road map to lead an organization from where it is now to where it will go. A strategic plan must reflect the thoughts, feelings, ideas and wants of the developers. It should be flexible & practical. So developed of a plan is a scientific research area, which involves many science disciplines such as statistic, information technology, economics & other. Decision tree is helpful to select the best decision among various alternative by manager. If it is based on probabilistic³, the managerial planning is enhance, which is discussed in this paper.

Keywords: Managerial Planning, Decision tree, Probability

INTRODUCTION

Strategic planning¹ is a tool for organizing the present on the basic of the projections of the desired future. A strategic plan must reflect the idea of the developers and mold them along with the association's purpose, mission and regulations into an integrated document. The development of a plan requires much probing, discussion, and explanation of the views of the leaders who are responsible for preparation of plan.

A decision is a reasoned choice among alternatives. We make decision regularly in our daily lives like personal decision, business decision, managerial decision, operational decision etc. But making decisions in the current dynamic environment is complicated and indefinite because of various unpredictable factors and large volumes of information. Therefore, it has become a key issue for modern organizations to have efficient system and tools to support rational decision-making in problem-solving processes. *Making decision* is a part of the broader subject of problem solving. It involves choosing a course of action that will benefit an organization or a person more than any other course of action could. We can estimate the effect of various decision alternatives. If the alternatives can be enumerated along mathematical axis, manager can choose the one that yields the best result and enhances the performance of managerial planning. This type of techniques is given in this paper.

Managerial Decision for Planning: We make decision regularly in our daily lives. It may be personal decision, business decision. Making decision has always been immanent to human nature. The concept of decision making is known in the most organization as a critical activity. It is

part of broader subject of problem solving. Problem solving is the overall process of closing the gap between reality and more desirable situation. To solve a problem, first we must realize that the problem gap exists, and then we must conclude that the problem is important enough to do something about. Having done this, we will probably discover that there are obstacles which prevent us from reaching the desired state immediately and effortlessly.

Developing the process of decision making is a scientific research area, which involves many science disciplines such as statistics, information science & other. Decision tree is a technique which can be use by manager for taking a good decision in different condition that is given as follows.

- **Decision tree:** It is a graphical method for identifying and representing alternatives course of action, associated outcomes, their probabilities and final payoff. Decision tree is a simple method for making a decision where all the options are opened in front of the decision maker in concise form and he can easily visualize them. It is equally beneficial for a simple everyday problem or complex decision-making situation in any field.

Basically decision tree is drawn for those problems whose have more than one decision that are to be taken at one stage. Decision tree consists of two types of node.

1. **Decision node:** It shows an action or a decision. It is represented by a square.
2. **Chance node:** It shows point of uncertainty. It is represented by a circle.

Step for drawing a decision tree: There are following steps for drawing a decision tree.

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1. Identify the decision nodes, chance nodes and alternatives course of action.
2. Place them systematically in an appropriate order/sequence. Keep the decision node firstly followed by alternative actions and chance nodes.

Evaluate Decision tree: Actions are selected by evaluating the decision tree for each possible setting of the decision node. Once the decision node is set, it behaves exactly like a chance node that has been set as an evidence variable.

The algorithm for evaluating decision tree is given as the following.

Algorithm:

1. Assign probability for each course of action and find out the pay-off associated with them.
2. Calculate the expected pay-off for each course of action.
3. Choose the course of action having maximum value of expected pay-off then move backwards to next stage.
4. Repeat the same method till the first decision point is reached.
5. Mark the sequence of action of courses with have adopted from beginning to end.

A decision tree is analyzed using the roll-back technique. The calculations are started from the last decision in the sequence and works back to the first for each of the possible decisions. Representation of a decision tree is shown in figure 1.

The Probability² of node is given by $= \sum_{i=1}^n (P_i \times PO_i)$

Where P_i is a probability of node and

PO_i is Probability of occurrence say X_i

Probability of chance node 1 is given by $P_1 * X_1 + P_2 * X_2$

Similarly Probability of chance node 2 is given by $P_3 * X_3 + P_4 * X_4$

Since decision node A has two alternatives so we choose those chance node which has maximum Probability.

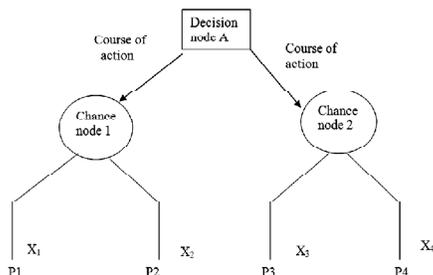
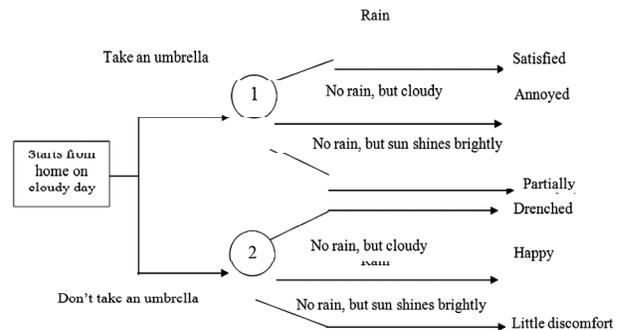


Figure 1: Decision Tree

Example: Let us take an easy problem. A person, on a cloudy day, is leaving his house for office. He has two options whether to take an umbrella with him or to move without it. If it rains on the way to office he will be satisfied and relieved that he is carrying an umbrella to save himself from rain. If there is no rain he will be annoyed that uselessly he carried an extra weight with him. If it doesn't rain, but sun shines brightly, he can still use the umbrella although the purpose will be totally different from the one for which the umbrella was carried. This problem can be represented by a decision tree as shown in figure 2



CONCLUSION

Managerial Planning⁵ is the most basic function of management. Planning is the function that determines in advance what should be done. It reflects the thought, feelings and idea of the developers. It should be flexible and practical. So developed of a plan is research area which involved many science disciplines. We make decision regularly in our daily lives like personal decision, business decision etc. but making decision in the current dynamic environment is complicated due to unpredictable factors and large volumes of information. Therefore, it has become a key issue for modern organizations to have efficient system and tools to support the best decision-making in problem-solving processes. So we have been discussed to probability based decision tree that provide a technique which is helpful to the manager for making a good plan.

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