

## Short Note on Decision Analysis

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### DESCRIPTION

Decision Analysis (DA) is a form of decision-making that consist of the identifying and assessing all the aspects of a decision, and taking actions based on the decision that produces which most favorable outcome. The goal of decision analysis is to ensure that the decisions are made with all the interrelated information and options available. For example, a corporation may use it to make million-dollar investment decisions, or an individual can use it to decide on their retirement savings. As a form of decision-making, the fundamentals of decision analysis can be used to resolve a multitude of problems, starting complex business issues to simple everyday problems. Decision analysis allows corporations to access and model the possible outcomes of various decisions to determine the correct course of action. To be effective, the business needs to understand various aspects of a problem to result in a well-informed decision. The analysis involves understanding various goals, outcomes, and uncertainties involved, including the use of probabilities to measure the expected outcome of various decisions. One of the most important aspects that involve framing the problem in a way that allows for further analysis. Framing is usually the first part of decision analysis, and it involves creating a framework to evaluate the problem from multiple perspectives. They may include opportunity statements, action items, and measures of success. Once the framework is done, a model can be developed to evaluate the favorability of various outcomes. After creating an outline to evaluate a problem, models are typically used to evaluate the outcomes of various decisions. Models are visual representations of expected conclusions, and they are used to illustrate decisions in comparison to other alternatives. By modeling the different expected outcomes and their probabilities, businesses can then select the decision that produces a favorable outcome. One of the most typical models

involved in decision analysis is decision trees, which are tree-shaped models with “branches” that represent potential outcomes. Decision trees are used since they are simple to understand and provide the valuable insight into a problem by providing the outcomes, alternatives, and probabilities of various decisions. This model makes it easy to evaluate which decision results in the most favorable outcome. After a model is developed, it is important to find the Expected Value (EV) to evaluate which decision results in the most favorable outcome.

Recall the decision trees provide all the possible outcomes in comparison to all the alternatives. By calculating the expected value, we can observe the average of outcomes of all the decisions and then make an informed decision.

To calculate the expected value, we necessitate the probability of each outcome and the resulting value. The formula for the expected value is as follows:

$$EV = (\text{Probability A} \times \text{Expected Payoff A}) + (\text{Probability B} \times \text{Expected Payoff A})$$

The above formula assumes that a business decision has two outcomes-success or failure. Each outcome can be represented by Probability A or B. The Expected Payout refers to the gain or loss expected with each outcome.

Decision analysis uses different tools to evaluate all the relevant information to aid in the decision-making process and incorporates aspects of psychology, management techniques, training, and economics. It is often used to assess the decisions that are made in the context of multiple variables and that have the possible outcomes or objectives. The process can be used by the individuals or groups attempting to make a decision related to the risk management, capital investments, and strategic business decisions.

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