

Decision Making

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Orientation session





Decision Making



Decision making is the process of making choices by identifying a decision, gathering information, and assessing alternative resolutions



Chapter
01

Management decisions are often complex because they involve

- 1. Risk and uncertainty**
- 2. Multiple objectives**
- 3. A complex structure**
- 4. Multiple stakeholders**



Management decisions are often complex because they involve

1. Risk & Uncertainty

Risk Versus Uncertainty. Risk, as it is generally understood by health and safety risk analysts, measures the probability and severity of loss or injury. Uncertainty, on the other hand, refers to a lack of definite knowledge, a lack of sureness; doubt is its closest synonym.

2. Multi-objective decision making (MODM),

also known as multi-criteria decision making, is a systematic procedure targeting at supporting decision makers faced with conflicting evaluations. The procedure aims at highlighting these conflicts and deriving a way to come to a compromise in a more transparent manner.

Management decisions are often complex because they involve

3. A complex structure

Decision making are usually made at three levels in **an organization strategic, tactical and operational levels**. Hence, we have three types of decisions based on these three levels. Strategic decisions are executive-level decisions.

4. Multiple stakeholders

Stakeholders are anyone who is affected by, interested in, or has influence over your decision. They can be internal or external to your organization, such as customers, employees, managers, partners, suppliers, regulators, or community members

Chapter
02

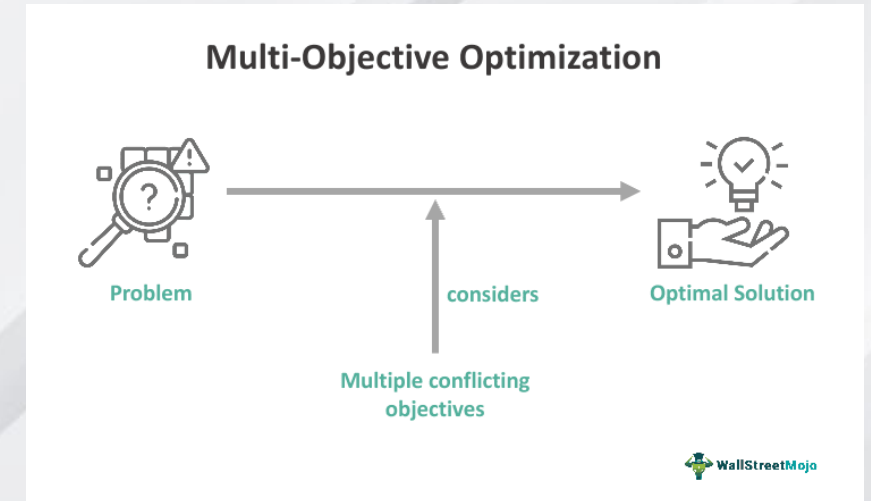
Examples of decisions involving multiple objectives

Choosing a holiday

- ✓ liveliest nightlife
- ✓ least crowded beaches
- ✓ most sunshine
- ✓ most modern hotels
- ✓ lowest cost

Choosing a company to supply goods

- ✓ best after-sales service
- ✓ fastest delivery time
- ✓ lowest prices
- ✓ best reputation for reliability



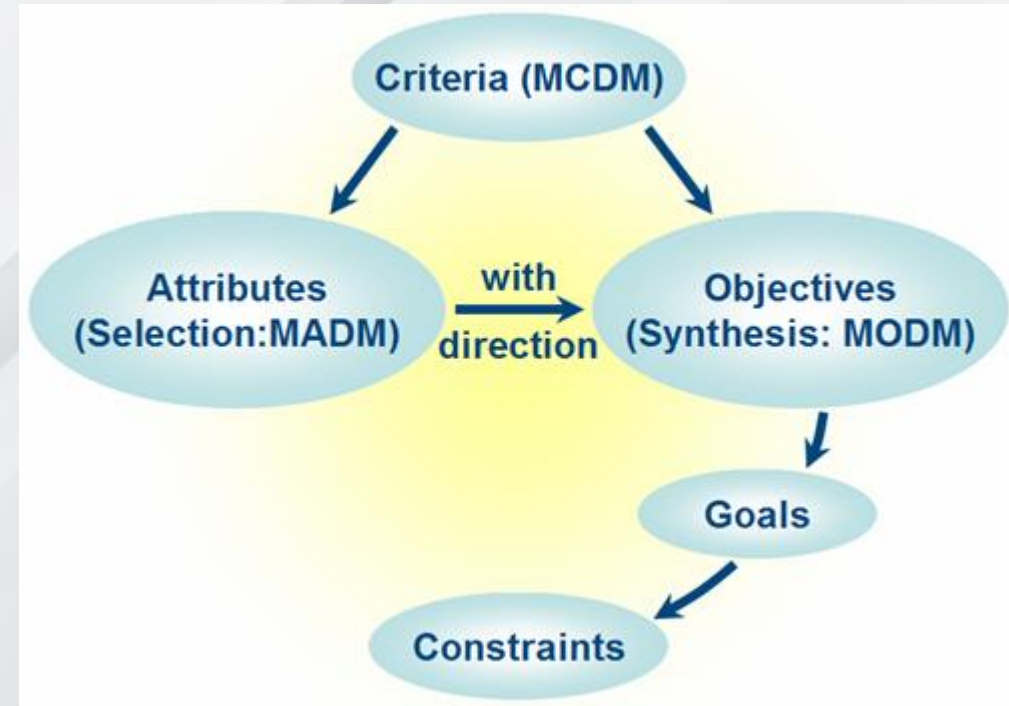
Examples of decisions involving multiple objectives

What is decision-making in multiple objectives?

Choosing a strategy in the face of multiple objectives often requires the navigation of trade-offs among the objectives. In other words, different solutions may perform better than others with respect to particular objectives.

Chapter
03**Objectives and Attributes**

The foundation for any decision is a clear statement of objectives. Attributes clarify the meaning of each objective and are required to measure the consequences of different alternatives. Unfortunately, insufficient thought typically is given to the choice of attributes.



Objectives and Attributes

What are attributes in decision-making?

All decision-making attributes can be divided into two types. One is qualitative attributes, and the other is quantitative attributes. Quantitative attributes should be preferred when a set of attributes is built since their values can be easily obtained.

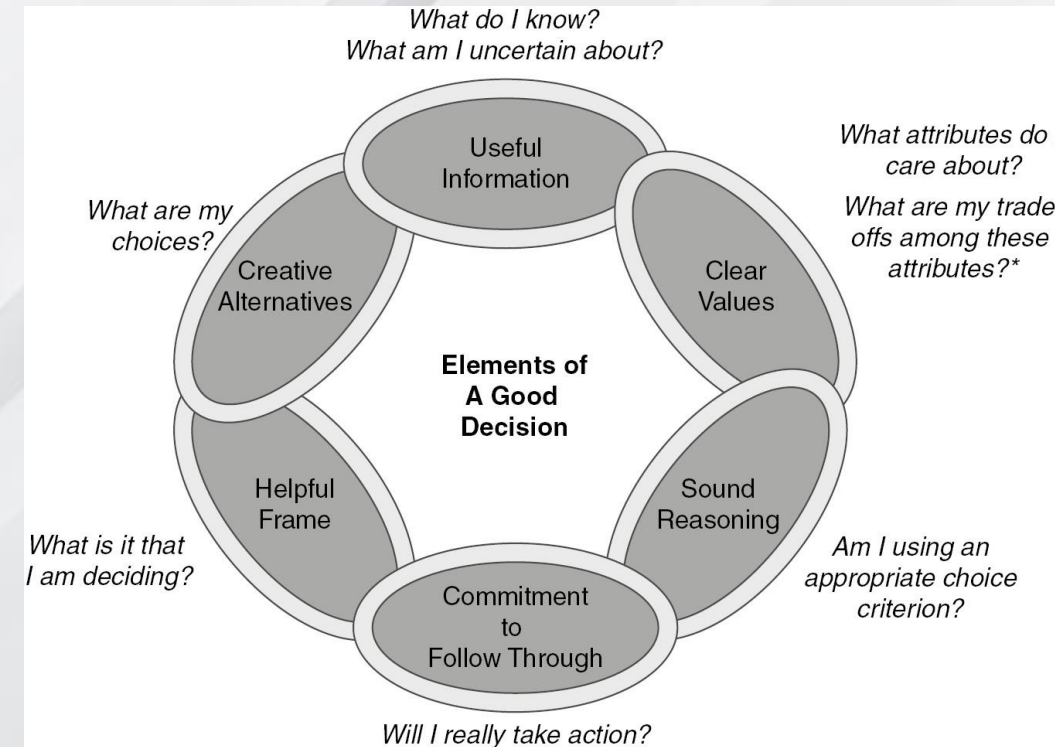
What is an objective in decision-making?

An objective decision is one which is not influenced by one's personal feelings, perspectives, interests and biases. Instead, it considers only verifiable facts and all stakeholders' interests (perhaps equally). It may even respect stakeholders who have yet to be born, animals and the Earth as a whole.

Chapter
04

Decisions involving multiple objectives: Alternatives to SMART

The Multi-Objective Decision Making method is a systematic decision making process. It allows a decision maker to define a decision, define their own value system, frame the context and evaluate the decision in a systematic manner.



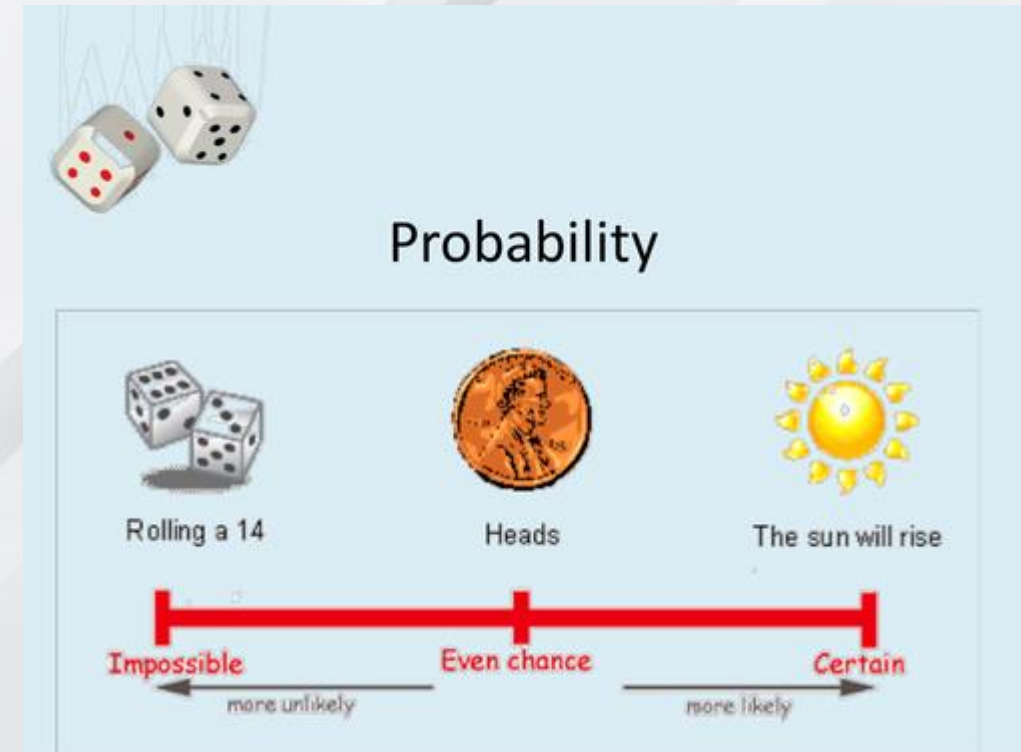
Decisions involving multiple objectives: Alternatives to SMART

What is the SMART method of multi-attribute rating technique?

The SMART technique is based on a linear additive model. This means that an overall value of a given alternative is calculated as the total sum of the performance score (value) of each criterion (attribute) multiplied with the weight of that criterion.

Introduction to Probability

Probability means possibility. It is a branch of mathematics that deals with the occurrence of a random event. The value is expressed from zero to one. Probability has been introduced in Math to predict how likely events are to happen.



Introduction to Probability

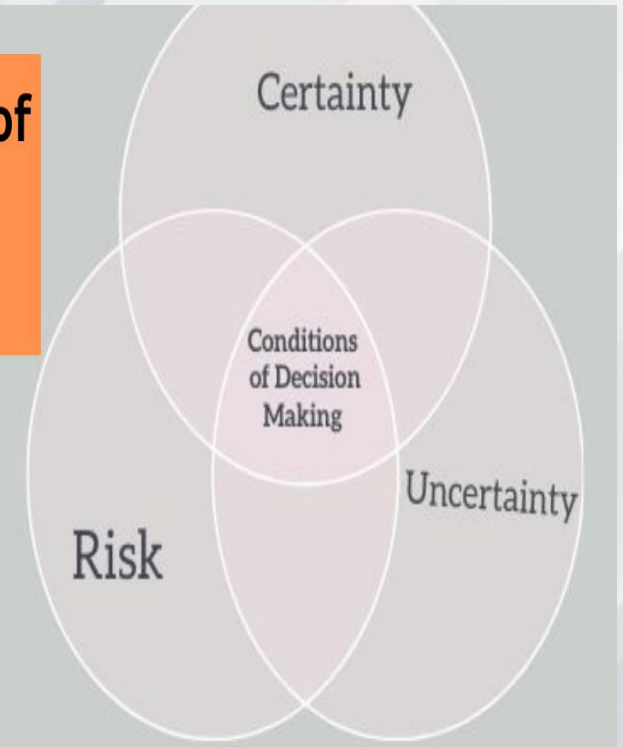
How can probability help us in making wise decisions?

You can calculate the probability that an event will happen by dividing the number of ways that the event can happen by the number of total possibilities. Probability can help you to make better decisions, such as deciding whether or not to play a game where the outcome may not be immediately obvious.

Chapter
06**Decision making under uncertainty**

In the prototypical formulation of decision making under uncertainty, an individual decision maker (DM) must choose one among a set of actions, whose consequences depend on some unknown state of the world.

**Conditions of
Decision
Making**



Decision making under uncertainty

How can you make decision when there are uncertainty?

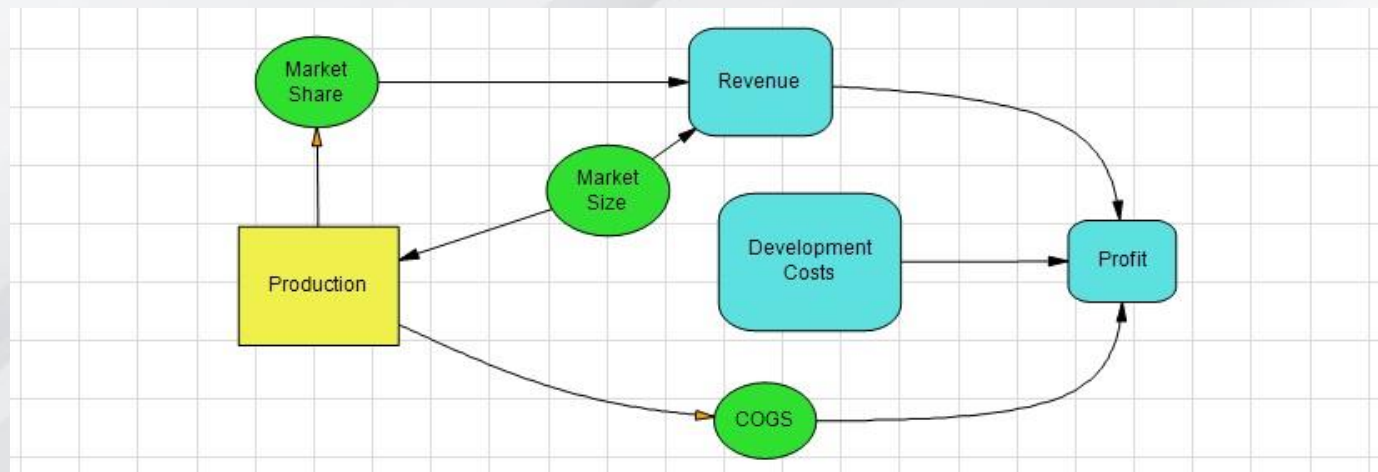
5 tips for making decisions in uncertain situations

- ✓ Have a vision of what you wish to achieve, rather than comparing alternatives.
- ✓ Form a group within which dissenting voices can make themselves heard.
- ✓ Act rapidly.
- ✓ Do not wait for more information before taking action.
- ✓ Create options and boost reversibility.

Chapter
07

Decision Trees and Influence Diagrams

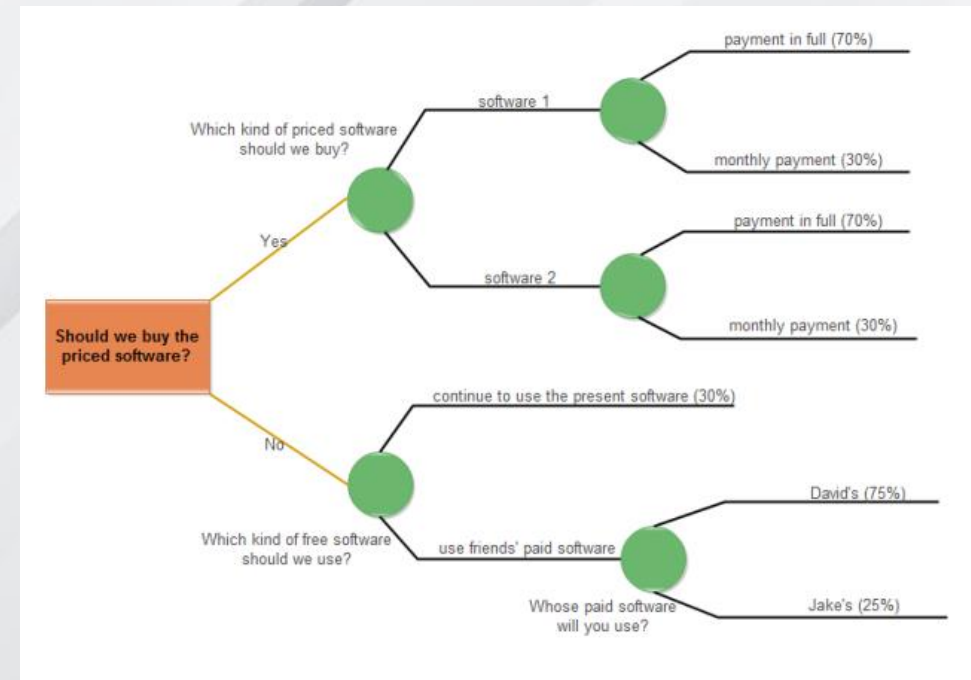
An **influence diagram** is a general representation of key identified risks, alternatives, and outcomes in a way that represents their interconnectivities and relative ordering



Chapter
07

Decision Trees and Influence Diagrams

A decision tree diagram is a type of flowchart that simplifies the decision-making process by breaking down the different paths of action available. Decision trees also showcase the potential outcomes involved with each path of action.



Decision Trees and Influence Diagrams

How to do influence diagrams?

Influence diagrams can be developed from a systems map by adding arrows and can be used as the starting point for a multiple cause diagram.

How to do decision trees?

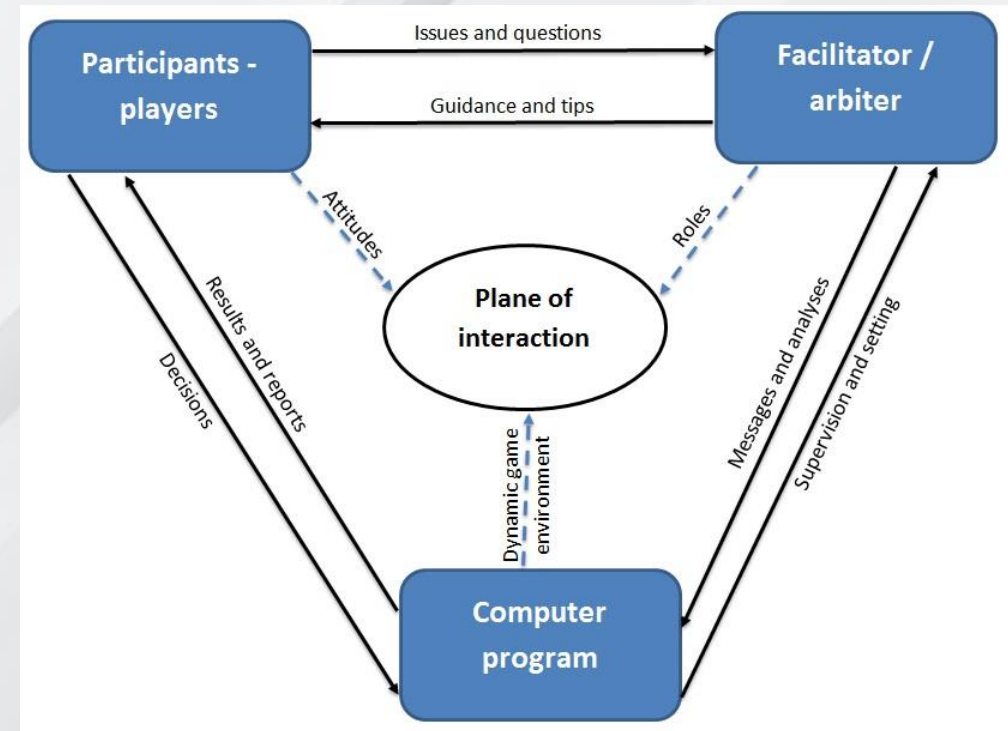
Follow these five steps to create a decision tree diagram to analyze uncertain outcomes and reach the most logical solution.

1. Start with your idea. Begin your diagram with one main idea or decision.
2. Add chance and decision nodes.
3. Expand until you reach end points.
4. Calculate tree values.
5. Evaluate outcomes.

Chapter
08

Applying Simulation to Decision Problems

Simulation techniques consist in sampling the input and characterizing the uncertainty of the corresponding output. This is notably the case of the crude Monte Carlo method that is well suited to characterize events whose associated probabilities are not too low with respect to the simulation budget.



Applying Simulation to Decision Problems

What are the applications of simulation method in solving management decision problems?

Simulation provides a safe environment for experimentation and allows students to try out new ideas without jeopardizing real-world operations. Additionally, simulation can be used to compare different approaches to operations management and to find the most efficient and effective solutions.



Thank You