

An Over view of Decision Making Models

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Abstract - Decision theory is one of the basic statistical methods used in everyday life. On one side, decision theory can be related to the theory of estimation if the state of nature is treated as a parameter. On the other side, it can be related to game theory if the state of nature is treated as the choice made by nature as an adversary of the decision maker. In any case, decision theory is the backbone of management and statistical decision theory helps managers take optimal decision under uncertainty. This paper discusses the development of decision theory from deterministic rule-based decision-making to datadriven or evidence-based decision making. Some basic concepts and definitions are given here for a better understanding of the subject and its development.

Keywords: Decision Theory, Decision making model, rational model, intuitional model, operational risk model, recognition primed decision making, satisfice.

I. AN OVERVIEW OF DECISION MAKING MODELS

We even have to make a decision as to which one to select from among them. There are rational models, intuitive models, rational iterative models as well as 5, 6, 7 and even 9 step decision models. Most, however, move through each of the basic stages in decision making. In this paper, we will quickly go through the main points of some of these decision models so that we get an idea of what is available. Some of these decision making models presuppose that decision making is the same as problem solving. Frequently, the first step in the decision making process is to identify the problem. It is, however, not necessary to believe that every decision is solving a problem. For example, deciding whether we want dark chocolate or milk chocolate is not, in and of itself, a problem frame.



(Source <http://www.the-happy-manager.com/articles/rational-decision-making-model/>)

Generally there are three basic models for decision making

- A. *Rational decision making models* (Decision matrix analysis, Pugh matrix, SWOT analysis, Pareto analysis and decision trees)
- B. *Intuitive decision making models*
- C. *Recognition primed decision making model*
Most of the people consider the common process to choose the decision models follow like:
 1. *Which decision making process?*
 2. *A decision making process that works*
 3. *Decision making process 95 % of the time...*

II. THE PROCESS OF DECISION MAKING

Decision making is an activity that causes excitement as well as anxiety. The excitement is in anticipation of making a good decision and desirable outcome. The anxiety, on the other hand, is in anticipation of a possibly wrong decision that may prove to be disastrous. Let us therefore begin with some fundamentals of decision making. The literature contains some definitions of decision making. Which includes?

1. The cognitive process of reaching a decision.
2. A position or opinion or judgment reached after consideration.
3. Choosing between alternative courses of action using cognitive processes, namely memory, thinking, evaluation, etc.
4. The process of mapping the likely consequences of decisions, working out the importance of individual factors, and choosing the best course of action to take.

2.1 What is a decision?

When people ordinarily consider their own definition of decision making, it is typical that they consider that somehow it is a thinking process, with a lot of mental activity involved in choosing between alternatives. But this does not include the way some people make decisions. We may have heard people saying something as follows.

1. I have a gut feeling.
2. I know in my heart.
3. I feel it in my bones.

So, the questions are as to how we can explain this. The simple way of doing so is to look for a more practical definition.

2.1.1 More practical definition of decision making

When people make decisions, they actually use their whole organism, not just their thinking abilities. Consider, for example, when somebody uses a phrase such as "I knew at the time that I probably shouldn't have chosen this one, but I did it anyway". Usually what this means is that their system is making one choice, and mentally they choose something else. And later, the bad decision comes back to haunt them. This brings us to a new term: satisficing, a noun derived from the verb *satisfice*.

2.1.2 Definition of Satisfice

To *satisfice* is to choose, not the best option, but the first option that is good enough. It seems that more options are not always better. Very often we simply don't have the time for "optimizing" or "maximizing". It used to be thought that we were rational creatures and made the best, or optimal, choice every time. This is the idea behind the rational decision-making models.

2.1.3 Bounded rationality

In 1956, an American social psychologist Herbert Simon suggested that we work in a bounded rationality, meaning thereby that our rationality is limited by the information available to us. He said that we don't always optimize, what we do instead is *satisfice*. The word *satisfice* is a combination of *satisfying* and *sacrificing*, the idea being that we choose a satisfactory option while sacrificing potentially better ones. Or it is a combination of *satisfy* and *suffice*.

2.1.4 Satisfice Vs optimize

Any option chosen by sacrificing is justified because it is not worth spending any more money, time, or effort in finding alternative solutions. And this in turn means that it is also a kind of optimization. Unless we are into decision theory, the important things for us to consider are the two that follow.

1. How much do we want the 'best' solution?
2. What are the difficulties in achieving this 'best' solution?

2.1.5 Why we do it? And what to do?

Simon suggests that there are several reasons for us to do this. Some of these are the following.

1. We are not particularly good at working out probabilities. How many sure things have we known to go wrong?
2. We find it difficult to quantify choices and so picking the best can be a chore.
3. We usually don't have all the information we would need to evaluate outcomes precisely.
4. Our memories play tricks on us in that recent information is more fresh in our minds than something from several years ago that is more relevant.

In stressful situations, this may be particularly relevant. Something that eases the stress right now may be good enough right now, but may not be good enough to ease the stress tomorrow or the day after.

2.2 What is decision making?

The simplest answer to this, It is the process of selecting from several choices, products or ideas, and then taking action in relation to this choice in order to bring about a desired result.

2.2.1 Types of models

These models are rational decision making strategies and involve a lot of reasoning and thinking to make a decision. The opposite of this are the intuitive models and there are many people offering lessons on decision making using this approach. There are also other models available, such as recognition primed decision making, as well as models which have been adapted for the use of groups.

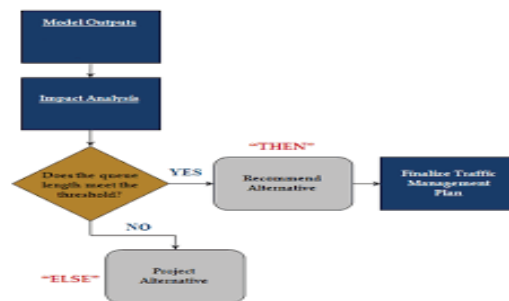
2.2.2 Evaluating a decision

Once we take action after making a decision, it is important to assess whether or not the action has achieved, or is achieving, the desired outcome. If it is, well and good. If it is not, then either a new decision has to be made, or the old one updated, or some new action undertaken.

III. RULE-BASED DECISION MAKING MODELS

3.1 What Is Rule-Based Decision Making?

Rulebased decision tools are decision making models that can be used even by a non-expert or an inexperienced person to make decisions like an expert. It is generally assumed and that having the relevant information in the field of application is one of the basic factors that allow decision-makers to make effective decisions. Rule-based decision tools are the most suitable tools available to the novice decision-maker and are therefore most commonly used in these situations to overcome these limitations.



It is an accepted principle that experts make better decisions than beginners. The question that the beginner has is how to become an expert? Is it enough to keep working in the same organization and possibly in the same position for a long time? Or, is it necessary to do something outside of the job requirement to become an expert? The answer is not very simple, but can be simplified as follows. An expert is a person having sufficient experience and adequate knowledge. How do we measure experience? Is it measured in terms of the amount of time we spend in an activity? This is where statistical considerations become useful. A person gains more experience if he faces different situations. How do managers learn from experience? The answer lies in the way they use their experience and knowledge. This knowledge can then be applied to the available information in a particular situation so that anybody can hope to make more effective choices than merely be=y intuition. Furthermore, this method also allows decision-makers to make faster decisions.

3.2 The design of Rule-Based Decision Making Models

In the beginning, it is necessary to identify all possible decisions or outcomes that could reasonably occur in a given situation and they must be arranged in the form of a list. Then a list of possible questions is set out about specific circumstances or conditions that may or may not be present, but are likely to occur sometime or the other. Finally, a set of rules is established with all possible 'if this then that' scenarios. The following section has more discussion on how and why rule-based decision making becameunpopular and is hardly in use in the modern information age.

Strength	Weakness
They are very structured.	Reactive: It can be boring and repetitive filling in data with little real learning occurring.
Allow people to learn and make decisions 'like the experts'.	Inflexibility: As the user develops expertise, user may 'outgrow' the tool.
No special skills are required and so they are easy to use.	Limiting: Only prescribed decisions are allowed.
Because it is documented, it's easy to keep records and this allows for accountability.	They are only as useful as the overall design and the questions asked.
	They do not include the human being.
opportunity	Threats
Rule-based decision tools can be used for quantitative as well as qualitative decisions.	Define the situation
The rule-based decision tools allow to quickly give a quote over the phone after filling in particular details of an applicant, for example	Generate alternatives
Situations involving qualitative decisions in which knowledge-based systems have proved useful include biological systems such as managing lake systems, prescribed burning of forests, rotating livestock herds around fields and avalanche prediction.	Information gathering
	Selection
	Action
	Order

IV. DECISION MAKING TOOLS AND TECHNIQUES

Decision making tools and techniques are often spoken about together, but here we will make a distinction. Such things as visual aids and other helpful instruments are decision tools, and techniques are the processes used to arrive at a decision. Decision strategies may sometimes determine which decision making tools and techniques are best to use.

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| 1. Computers and decision support systems | 5. PMI: Plus, Minus, Interesting |
| 2. Decision Tools | 6. Decision making matrix / Grid analysis |
| 3. A simple T Chart | 7. ORM Risk Decisions |
| 4. Intuitive | 8. Decision Trees |

REFERENCES

- [1] Celine, C. (2011). Difference between Models and Theories. Retrieved from <http://www.differencebetween.net/>
- [2] Franco, A. (2011). How OR Can Contribute to Strategy Making. *Journal of Operational Research Society*, Vol. 62, No. 5, pp. 921-932.
- [3] Klein, G. A. (1989). Recognition Primed Decisions. In *Advances in Man-Machine Research*, Rouse, W. B. (ed.), Vol. 5, pp. 47-92, Greenwich, CT; JAI Press.
- [4] Lipshitz, R. (1994). Decision Making in Three Modes. *Journal for the Theory of Social Behavior*, Vol. 24, No. 1, pp. 47-65.
- [5] March, J. G. (1994). *The Primer on Decision Making*. The Free Press, New York.
- [6] Montibeller, G. and Franco, A. (2010). Multi-Criteria Decision Analysis for Strategic Decision Making. In *Handbook of Multicriteria Analysis*, C. Zoupondis and P. M. Pardalos (eds.), pp. 25-48.
- [7] Nichols, F. (2010). Three Forms of Strategy: General, Corporate, and Competitive. Retrieved from <http://www.nichols.us/three-forms.pdf>
- [8] Oliveira, A. (2007). A Discussion of Rational and Psychological Decision Making Theories and Models: The Search for a Cultural Ethical Decision Making Model. *Electronic Journal of Business and Organization Studies*, Vol. 12, No. 2, pp. 12-17.
- [9] Payne, J. W., Bettman, J. R., and Johnson, E. J. (1993). *The Adaptive Decision Maker*. Cambridge University Press, Australia.
- [10] Porter, M. (2008). *The Five Competitive Forces That Shape Strategy*.
- [11] *Harvard Business Review*, Vol. 86, No. 1, pp. 78-93.
- [12] Ram, C., Montibeller, G., and Morton, A. (2011). Extending the Use of Scenario Planning and MCDA for the Evaluation of Strategic Options.
- [13] *Journal of Operational Research Society*, Vol. 62, No.5, pp. 817829. Robbins, S. P. and Coulter, M. (2012). *Management*, (12th ed.). Prentice Hall, N. J.
- [14] Schoemaker, P. J. H. (1980). *Experiments on Decisions Under Risk: The Expected Utility Theorem*. Martinus Nijho Publishing, Boston.

- [15] Simon, H. A. (1955). A Behavioral Model of Rational Choice, Quarterly Journal of Economics, Vol. 69, pp. 99-118.
- [16] Simon, H. A. (1977). The New Science of Management Decision, Revised Edition. Prentice Hall, N. J.
- [17] Von Neuman, J. and Morgenstein, O. (1947). Theory of Games and Economic Behavior, Second Edition. Princeton, N. J.