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# Making Right Decisions in IT Project Management

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## Abstract

Formalized decision analysis process helps IT project manager to make a right decision. The article describes how to use decision analysis techniques to mitigate negative impact to psychological biases and select most effective project decision. The article also give practical recommendations, how decision analysis process can be integrated to the IT project management process.

## Introduction

Several years ago a telecommunication company started to offer a shared web hosting solution to their clients. Shared hosting required a tool to manage accounts, access to webmail, and other functions. The company made a decision to develop their own applications instead of purchasing or modifying available off-the-shelf software. The development of these applications took longer cost more than originally planned. In addition, major improvements to satisfy new customer requirements were required. At this point company still had choice to use off-the-shelf software, but did not because of the investment that they had made in its own system. Currently, the cumulative development and maintenance costs of this system is several times higher than if the company had made the decision to go with off-the-shelf software at the start of the project.

Project managers are making decisions all the time on different stages of the project. Some decisions are strategic: they are usually made during initiation of the project and significantly affect the further course of actions. Other project decisions may not be so important, and it is possible to make some corrective actions if something goes wrong.

## The Role of Decision Science

What needs to be done to help project managers to make a correct decision? How people are processing huge amount of information? How they evaluate and select alternatives? How they assess and interpret probabilities of potential events or risks? Decision science, as a part of overall management science is trying to answer these and other questions. Decision science is the unique discipline because it is based on two seemingly not very well related knowledge areas: psychology and statistics. Psychology of judgment and decision-making helps to identify specific mental patterns people are using to come up with certain decisions. Statistical methods are used as a part of decision analysis to provide an aid to the decision-makers.

In recent years decision analysis has become a practical tool in many disciplines. Companies routinely base their major investment strategies on the results of decision analysis. Moreover, in some industries, such as oil and gas or pharmaceutical, companies will never proceed with the major projects without comprehensive formal decision analysis. For example, if an oil company has a number of prospects, decision analysis will help to identify those which need to be developed first taking into account potential uncertainties in estimations of oil reserves. Decision science is used for analysis of mergers and acquisitions, capital investment, reorganization, new product development, and in other areas. Governments are using decision analysis for their policy decision. For example, US Government is applying decision science methods to decide whether strategic oil reserves should be based on analysis of potential disturbances of oil supply. Lawyers are using decision analysis for assessment of complex litigations with the uncertain outcomes. Decision analysis helps medical professionals to make a correct diagnosis and prescribe a most effective treatment.

Good decision analysis includes risk analysis, which is actively used in many areas including project management. Many organizations are trying to establish a formalized risk management process, which is proved to be very efficient practice. Various methodologies and tools to support decision-making are widely used in project management. It includes project scheduling and portfolio management tools and techniques, qualitative and quantitative risk analysis, as well as project performance measurement.

Still many project managers remain unfamiliar with some important concepts of decision analysis, particularly related to psychology of judgment and decision-making. If project managers knew some basics about human mental process, it would help them to avoid some psychological traps and make a correct decision.

### **Psychological Traps**

Let's consider an example of such psychological traps. In 2002, Daniel Kahneman was awarded the Nobel Prize in economics "for having integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty." According to the theory he developed together with Amos Tversky, people are using heuristics or "rules of thumb" to provide a correct judgment. These heuristics are essentially certain simplification strategies or mental "shortcuts". In many cases such heuristics work reasonably well. However, in some causes they provide predictable faulty judgment or cognitive bias. One of such "rules of thumb" is called availability heuristic. Decision makers assess the probability of an event by the ease in which instances or occurrences can be brought to mind. For example, project managers sometimes estimate the task success rate based on similar tasks that have been previously completed. If they make judgments based on the most or least successful tasks they remember, it can cause inaccurate estimations. Another heuristic is called anchoring. It refers to the human tendency to remain close to the initial estimate. For example, project manager started thinking about the duration for an activity that had an original estimate of five days. Anchoring causes the analysis to stay close to the original estimate, so that even after the analysis is completed, the five day guess will remain the most likely estimated duration or average duration will be within a range from four to six days. There are a number of other important psychological phenomena project managers should be aware of, including selective perception, biases in estimation probabilities and risks, psychological issues related to group decisions.

The knowledge of the illusion does not guarantee that project manager's decisions will not be a subject of illusion. In other words, even though project manager might know potential mental pitfalls, he could still fall into these pitfalls. The solution is to use some analytical tools such as computer software, forms, or templates, which can provide a rational input for subjective human decision-making process. The example is the tools for statistical analysis of historical project data as part of project portfolio management solution. If the project manager has an access to comprehensive set of data related to previous activities, the estimation of future similar activity will be more accurate. It will help to mitigate negative impact of availability or anchoring heuristics.

### **Practical Recipes**

Decision analysis can be very efficient if analytical tools are used not from time to time, but as a part of the workflow or the process. Decision analysis process is developed based on extensive research and proven to be an effective way to improve the quality of decisions. The process starts with the decision framing, which includes identification of a problem or opportunity, assessment of a business situation, generation of alternatives, and identification of risks and uncertainties. The next step is modeling the situation. Using the mathematical model quantitative analysis can be preformed to determine which alternative or strategy can bring better results based on selected criteria. The final step is making decision on course of action, allocating resources, and implementing the plan. The process can be repeated to correct decision if new information has become available.

Comprehensive, continuous, and consistent process will definitely help with making strategic decisions: making major investment, starting using a new product, selecting a major partner, or choosing a development platform. But what about day-to-day decisions that project managers are facing all the time? The answer is that project manager must always remember about few simple rules of decision analysis regardless of how important is the decision:

1. Always remember and think about most important potential mental traps in project management and try to avoid them while making this particular decision.
2. Always try to properly understand the problem or opportunity by answering five simple questions:
  - a. What do you want to achieve?
  - b. What is the business situation: what can be done and what cannot be done?
  - c. How can you measure the success of the process or activity?
  - d. What alternatives do you have? Always remember "No alternatives, no Decisions".
  - e. What are the uncertainties pertaining to this particular business situation?
3. Use quantitative methods as needed. These methods could be as advanced as you can properly interpret, but always directly related to the problem or opportunity.

To a certain extent these rules represent some sort of thinking "culture" that project manager should possess in order to make a good decision. Project manager should not rush to a conclusion by applying known mental "shortcuts". Instead he should use a logical analysis based

on proven techniques to make a rational choice. It takes some knowledge and some practice, but it will pay off. Wrong decisions are costly.

It is important to remember that using decision analysis techniques does not guarantee that a decision will be one hundred percent correct. However, applying proper techniques of information analysis and thus mitigating negative impact of heuristics and biases could significantly improve quality of the decision.

This decision analysis process looks straight forward, but some project managers and in many cases executives still believe that intuitive or “gut feel” approach to decision making is the only way to go. They should remember that mental “shortcuts” were “programmed” in our mental machinery thousands years ago and exist in most decision-making regardless of profession, nationality, or position. “Gut feel” approach may successfully work in many cases, but fundamental limitations in our mental machinery may lead to biases, and consequently wrong decisions. By the way, it should not take much longer to make a decision about the problem or opportunity by using techniques suggested by decision science.