

How Robust Decision-Making Improves Project Management

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“Most of our executives make very sound decisions. The trouble is many of them have turned out not to have been the best decisions.” Donald Bullock

The Decision-making Challenge

Decision makers in high technology companies are faced daily with many types of problems:

- Which product option should we choose? (product development decisions)
- Which business model should we follow? (business decisions)
- Which vendor should we select? (procurement decisions)
- Which employee should we hire? (personnel decisions)
- Which software or other tool should we buy? (purchasing decisions)

All of these problems have multiple solutions. The goal is to decide which right or best solution to choose and to implement it. However, as the above quote states, it is not always possible to know what is meant by “best”. This article is about refining “best” and, in so doing, defining robust decision-making.

During the management of a project or in our personal lives, we make thousands of decisions each day. Every time we are faced with a choice, we make a decision that commits us to an action and the use of resources. When one of the proposed alternatives is chosen, future activity is focused on this alternative using time, money, and other resources. This focus excludes effort on the rejected alternatives. So, if a poor choice is made in the first place and it is later decided to revise the decision, the intervening time and expenditures are, for the most part, unrecoverable.

Why Decision-making is difficult

Why is decision making so difficult? There are quite a few reasons for this: First, there is usually no way to know all the alternative solutions to a problem. Second, it is not always easy to develop a good set of criteria to measure the alternatives. This is why there are many companies who specialize in Quality Function Deployment and Requirements Development methods. Third, every person has a different opinion of what is important. Fourth, evaluation information is never complete or certain. There is always more to know than there is time and capabilities to know it. Often evaluation is in terms of features that are difficult or impossible to measure (e.g. visual attractiveness, potential for

success). Fifth, problems are continuously changing and evolving. In summary, the uncertainties in decision problems make it difficult to find the “best” solution.

Actually, there is a sixth reason that decision-making is so difficult. The various symptoms of a poor decision may not be recognized immediately. For example, if a decision doesn’t “stick” it is probably a poor one. With an “unstuck” decision, the initial agreement is inconsistent with the activities people do later. Decisions don’t stick if there is no collaboration from all those involved. Another symptom, “firefighting,” identifies non-value-added activities that usually result from some earlier decisions gone wrong. Forgotten logic, another symptom, is characterized by the statement “I am not sure why we made this decision, but...” Finally, two major symptoms of poor decision-making are project lateness and cost overruns. You can not reduce or eliminate these symptoms without attacking their cause or the lack of robust decision making practices.

Defining Robust Decision-Making

Robust decision-making encourages following a strategy that eliminates all the uncertainties possible within the resources available, and then selects a satisfactory alternative that is as insensitive as possible to the remaining uncertainties.

There are four key elements in this definition: 1) following a strategy, 2) eliminating uncertainties possible within the resources, 3) selecting a satisfactory alternative and 4) being as insensitive as possible to remaining uncertainties. This definition is an analog of Taguchi’s method of robust design abstracted for decision-making. Each of these elements is discussed in the paragraphs below.

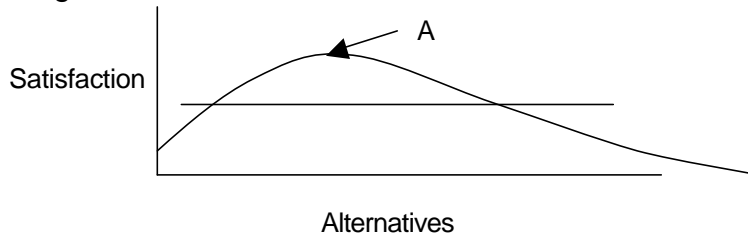
In your education, you were probably taught very little about decision-making. You may have had courses about logic and deduction: or matrices for organizing the alternatives and criteria, but, you never had a course in how to develop a strategy that works for uncertain, team based problems. Thus, the first key element of robust decision making is to have a strategy for setting up problems and deciding what to do next during their solution.

Furthermore, during your education, you probably learned that if your answer matched the one in the book, you had the right (i.e. best) answer. In real life, in business, and in engineering:

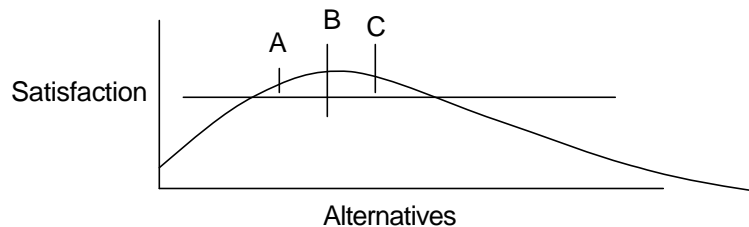
**There are no right answers.
There are only satisfactory answers.**

In fact, most issues have multiple, satisfactory solutions. Thus, the second key element of robust decision making is realizing that the goal is not to find the

“best” solution, but one of the many satisfactory solutions. Thinking of this in terms of optimization, in the figure below, all alternatives in the region above the horizontal line (representing minimum satisfaction) are satisfactory, not just point A. Even though this plot shows the alternatives as a continuous distribution, the same logic holds for discrete alternatives.



Earlier in this article we discussed the uncertainties in the decision making process. One key element of robust decision-making is to eliminate the uncertainties you can, make the decision insensitive to those that remain, and be wise enough to know the difference between them. In the figure below, the effect of the remaining uncertainty on three possible alternatives is shown as error bars. Here, point B is most satisfactory, but the effect of the uncertainties on it is very high. Point C is a little less satisfactory, and the variation due to uncertainties is better. And Point A is the least satisfactory of the three, but the potential that it will be a better solution in the long run is higher than the others because the uncertainty is smaller.



To realize robust decision making you must have a strategy; a method that includes uncertainties as an integral part of the strategy; a method that gives decision makers feedback about the effect of the uncertainties on the strategy; a method that determines which uncertainties to eliminate; and an indication of how to reduce the effect of the those uncertainties that can not be reduced. This philosophy is developed in the book *12 Steps to Robust Decisions* and implemented in the software *Accord™* (available from Robust Decisions Inc., www.robustdecisions.com.)

Summary

With robust decision-making support you can reduce the symptoms characteristic of poor decision making. You can enhance buy-in by all stakeholders, resulting

in decisions that stick. You can insure that everyone is solving the same problem and that it is the problem that needs to be solved. You can manage information uncertainty, inconsistency, incompleteness, and evolution. You can provide a rational decision-making strategy to build consistency, clarity, comprehension, communication, and consensus. You can reduce later fire fighting saving time/money. And, you can leave a traceable logic trail for later justification, process certification or reuse.

Word count: 1240