



Introduction to Decision Making

Making decisions and acting on these decisions are central to the management function. Managerial decisions vary greatly in substance, complexity, urgency, and in other ways. Consequently, how a person should reason about decisions varies accordingly. This note provides a framework for analyzing decisions and decision making.

The Decision Making Process

The decision making process can be described as comprising the following elements:

1. defining the problem / setting goals;
2. identifying alternative solutions;
3. assessing the pros and cons (costs and benefits) of the more attractive alternatives;
4. applying the criteria for selection;
5. selecting the preferred course of action;
6. implementing the decision, adjusting as necessary;
7. monitoring results and revising as necessary.

While the elements are listed in logical order, the sequence is not a rigid progression in practice. Iteration is common and constructive. For example, assessing the benefits of one possible course of action (step 3) might bring to mind a quite different possible solution (step 2). Or implementing a decision (step 6) might reveal serious inadequacies in the problem definition (step 1). While steps 6 and 7 might not apply for simple or irreversible decision, they do play a part in the many managerial decisions which favor the working out of detailed considerations in the course of taking action or which require heuristic problem solving (involving feedback and self-education).

Professor Francis J. Aguilar prepared this note as a basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

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Defining the Problem/Setting Goals

This step can be straightforward. A complicated software program malfunctions for an important line of automated equipment and the person most knowledgeable about it is abroad on a family ski vacation. The problem is that the custom-made parts scheduled for production and delivery to a customer cannot be processed as planned.

In more complex situations, defining the problem is often one of the most difficult steps in the process. Cause and effect relationships can be obscure and deceiving. Too often, attention is focused on a symptom rather than on the underlying source of difficulty. For example, a plant manager unable to keep up with a rapidly growing demand might define the problem as one of insufficient equipment capacity when a demoralized work force is primarily at fault.

In some cases, the challenge can become one of detecting or uncovering a problem. For example, managers can fail to anticipate a political upheaval in a foreign country where their company has major investments or be insensitive to a growing employee disenchantment with certain company practices as the work force gets larger or changes in character. It can take a great deal of skill and insight to uncover problems early, especially when everything seems to be going well.

To define what is wrong implies a certain understanding of what is right. In effect, a problem measures the unfavorable deviation of what is or will be from what is required or desired. An emission of 225 parts per million (ppm) of a certain chemical compound is only a fact. It becomes a problem when the legally permissible level is lower or when such an emission could be dangerous to health or destructive to the environment (irrespective of any regulations). Part of defining a problem is to specify the desired state of affairs or goals.

Identifying Alternative Solutions

Most problems have a variety of possible solutions. Even the straightforward problem of the malfunctioning software program has multiple possible solutions that might be considered. The expert on family vacation could be recalled immediately. Alternatively, other software specialists could be asked to try to correct the program. The parts could be processed on other machines in the plant. They might be obtainable from an outside source. Or the parts job could be put on hold until the key technical person returns. For more complex problems, the number of alternative actions and possible variations can become very large. The “best alternative” has to be identified in order to be evaluated and selected for action.

The search for a good solution can call for a great deal of creativity. Analogy, inference, and even serendipity can play a role. The best action might be one that is entirely new to a situation or one that has been widely rejected in the past. An open and imaginative mind can be of vital importance at this stage of the decision making process.

Evaluating Alternatives: Pros and Cons

The evaluation of alternatives initially concerns an assessment of favorable and unfavorable considerations. In the case of the malfunctioning software program, the relative attractiveness of recalling the technical expert from a family ski vacation abroad would depend on how urgent the need for the parts was, the feasibility of other solutions, the disrupting effect on the person and his or her family, and even the possibility that the person might resist or refuse the call to return. The alternative of making the parts on other machines would depend on the quality that could be obtained, the set-up and operating costs, the costs associated with displacing or disrupting other jobs, and possibly other considerations.

As the number and complexity of the alternatives increases, the identification and consideration of all relevant attributes becomes overwhelmingly burdensome. Various means have to be employed to simplify the elimination of weak alternatives so that sufficient attention can be given to a proper assessment of the most promising solutions. Simple comparisons of certain key consequences, a financial hurdle rate, or some other go, no-go specification are useful devices for initial screening. For example, subcontracting the manufacture of parts might be quickly discarded as impractical by comparison with other available alternatives.

The more detailed assessment of the principal alternatives can often be improved through the use of certain mathematical techniques known as decision aids. These aids include decision analysis, linear programming, game theory, linear regression, mathematical modeling, forecasting, and risk analysis. Since these tools rely on the availability of precise information, they have an added benefit of requiring a decision maker to sharpen the problem definition and the specific attributes of the alternatives.

Applying Criteria

The principal criteria for selecting a course of action are defined by the goals (step 1). Additional criteria emerge in the consideration of the pros and cons for the alternatives. For example, getting the parts produced when needed is the controlling consideration. All of the alternative solutions that were identified potentially could fulfill this requirement. The time and cost of producing the parts, quality, the effect on other jobs in the plant, the impact on customer relations, and the impact on the vacationing software analyst are additional considerations that will be used to make the decision.

With multiple criteria, selection of a course of action can become difficult as various alternatives excel with respect to individual criteria. A need arises to weigh the criteria so that a comprehensive and comparable assessment can be made of the alternatives. Time, cost, risk, and adequacy of performance are usually the principal variables that have to be balanced.

Rational choice involves assessing future consequences of current action and assessing future preference for those consequences. Both assessments can be very difficult to make in practice. Because of the informational and computational limits people experience, finding the very best course of action is seldom feasible. More common is for a decision maker to begin with an acceptable outcome and to work back to a set of antecedent actions sufficient to produce it. This approach, called “satisficing,” in effect curtails the search for additional alternatives as soon as one that would do the job is found. The risk of satisficing is in failing to uncover a far superior solution to the problem. The benefit is in not wasting a great deal of time and money in efforts that might uncover only marginal improvements.

Selecting an Alternative and Implementation

Selecting the preferred course of action is the result of the previous four steps. The actions taken, however, should be responsive to the circumstances and to how things work out. Often, the resulting program is changed in significant ways from the original intentions. In effect, most business decisions reflect the results of conceptual analysis and of practical considerations in the course of acting.

Monitoring and Revising

Since complex business decisions rarely proceed unerringly as planned, managers need to monitor what happens and to take corrective actions as necessary, including the possibility of retracting the decision. In most situations, this important task is made easier when interim targets

and acceptable deviation limits are projected at the time a decision is first implemented. These reference guidelines can be invaluable in alerting the people carrying out the decision (often not the decision makers) of a possible need for intervention and change.

The Human Dimension in Decision Making

Making business decisions is a human endeavor. As such, it can encompass behavioral and organizational considerations as well as analytical. Spending the time to work out the best solution to a problem might prove worthless if no one will accept or act upon your conclusion. Similarly, it might be difficult or impossible for you even to make a proper decision without the support and cooperation of others with respect to gathering information and making judgements. Decision making, if it is to be effective, must take into account the human and administrative dimensions that influence the organizational responses germane to a decision.

Decision making requires a person or persons with the ability to understand the underlying considerations of the problem, with strong diagnostic skills, and with good business judgement. It also requires this person or persons to be willing to participate in making the decision in a constructive manner. A person's motives are relevant to this dimension. Ability and willingness are critical qualities for decision making.

In all but the smallest organizations, the people responsible for analyzing a problem and recommending a course of action can be different from those responsible for approving the decision. Combining the two administrative elements of the decision making process—analysis and approval—with the two human attributes—ability and willingness—results in four enabling conditions for effective decision making, as shown in Figure 1: (1) an ability to conceive and to advocate a preferred course of action; (2) a willingness to conceive and to advocate a preferred course of action; (3) an ability to evaluate the analysis and to commit the organization to action; and (4) a willingness to evaluate and commit to action.¹ The distinctions between ability and willingness and between insight and commitment have practical significance for people concerned with the decision process.

Figure 1 Enabling Conditions For Decision Making

PERFORMER(S)' ATTRIBUTES	
Ability	Willingness
able to conceive and advocate appropriate solutions	willing to conceive and advocate appropriate solutions
able to evaluate recommended solutions and to commit resources	willing to evaluate recommended solutions and to commit resources

¹See Francis J. Aguilar, *General Managers in Action*, (New York: Oxford University Press, 1988), pp. 37-43 for further discussion of this concept with respect to strategic decisions.

Ability

Each problem situation calls for specific skills for its solution. These skills are not necessarily obvious. Knowledge about process software is a technical skill that appears critical to the example problem. But an examination of the alternatives reveals that it is not relevant to at least two (the use of other machines and subcontracting). Rather, the important decision making abilities relate to a knowledge of the manufacturing requirements for the parts, the plant operations, the customer's requirements, and the needs and attitude of the vacationing software expert.

In situations where managers are weak in certain abilities and lacking experience, the likely costs are easy to imagine. Vital information might not be forthcoming, important alternatives might be overlooked, and critical judgments might be defective. Less apparent, strong abilities and experience can also degrade the process. People tend to rely on decision-making techniques that have helped in the past and to favor solutions that have worked in similar situations. The distinctive characteristics of a new problem can be overwhelmed by the comfort factor in resorting to the "tried and true," especially if the new problem is difficult and requires urgent response. To avoid either of these negative consequences, managers have to give some explicit thought to the kind of skills and abilities that should be marshalled in preparing to deal with a difficult decision.

Willingness

The decision-making process is also shaped strongly by the motives driving the people involved. The effect of a decision on a person's power or reputation in an organization can effect and even dominate his or her thinking in the matter. It would be naive to overlook self-interest. Other motives—such as a natural desire to please or to avoid controversy—can also distort the analysis. People involved in a decision, at the analysis and at the approval levels, must be careful to consider how personal motives might distort the findings and recommendations and compensate for the effects.

Styles of Thinking

A further complicating factor is that people have different styles of thinking and analysis that can be incompatible to varying degrees. For example, some people have a need to be precise, systematic, impersonal, and unambiguous in their thinking. Others prefer to be spontaneous, subjective, and intuitional in their approach. People with such contrasting personal styles can find it difficult to work together or to convince each other on important points in dealing with complex decisions. An effective and mature manager recognizes his or her personal style, but also the importance to an organization's health for multiple management styles to be present and appreciated.

Process Considerations

Decision making has to be managed just as any other complex endeavor. Basic issues—such as defining the problem and identifying relevant information—have to be decided. Moreover, managing the process itself can be important in many situations. Who to involve in the process and timing are the kind of process considerations that can decide the fate of a major decision-making effort.

Participants. For the person responsible for deciding on how to solve a problem, one of the first administrative considerations concerns who, if anyone, to include in the effort. Clearly, people who are knowledgeable and creative about the issues in question should participate. However, when the choice between alternative solutions depends on difficult judgments or when a problem is emotionally charged, good analysis might not be sufficient to win organizational support. It can also

be important to include people who could add credibility to the decision. These are people who have the respect of others in the organization because of their past accomplishments or proven judgment. Other requirements might be germane, such as the need to include someone who has access to key senior managers or someone who can be seen as representing the interests of an affected party, such as the union or franchisees.

In like manner, for a controversial issue, the decision manager needs to consider whether to include people who are opposed to a likely or preferred course of action. The reason for doing so is to lessen opposition to the recommendation either by changing the critic's thinking or by changing the action to accommodate opposing points of view. The risk is that such a person might disrupt the group's functioning or use the detailed information in ways to discredit its position.

Organizing Concepts

Up to now, the note has focused on the various considerations relevant to a decision. Decisions and decision making processes, however, vary along dimensions that can be significant to a decision maker. Two such typologies are described briefly.

Classes of Decisions

While decisions can be categorized in many different ways, one useful distinction is between rule-based and analytically-based types. Rule-based decisions are those where the deciding factor is a specific guideline. The guideline might reflect laws, regulations, corporate policies, organizational norms, personal values, or moral scruples. For example, a company might clearly proscribe any action that breaks the law. Generally, analytical concepts play a limited role in this class of decisions.

The analytically-based decisions in turn can be subdivided into distinctive and repetitive types. The practical significance of this distinction is twofold. Repetitive decisions tend to provide a richer data base than do otherwise comparable, one-of-a-kind or infrequent decisions and are therefore generally amenable to more powerful analytical methods. Also important, repetitive decisions are more likely to warrant the investment needed to develop a data base and the systematic analysis of these data than would be true for a comparably-important isolated decision.

Decision Making Paradigms

Decision making is often treated like a black box phenomenon: information goes in at one end, a decision comes out the other, and something goes on in the middle. In complex situations, what goes on in the black box might be impossible to determine with any precision. Still, it is useful for managers to be aware of the various possible dynamics that could explain the process.

One classical study described three decision-making process paradigms to explain a single major decision (the U.S. government's response to the Cuban missile threat).² The first model is that of a rational actor, in which decisions are made on the basis of calculated choices to serve national interests. The second is based on organizational process, in which decisions reflect the outputs of established procedures (protocols as to who would be involved and how). According to this paradigm, the U.S. decision was shaped by the information received which in turn depended on such considerations as the schedules of the U-2 spy plane and of the routine collection of intelligence data from Cuban sources. The third model is political, in which decisions are a result of various

²Graham T. Allison, Essence of Decision, (Boston: Little, Brown, and Company, 1971).

bargaining games among the players involved. The idea is not that any one of these paradigms is more correct or more prevalent, but rather that all three are operating at the same time with sometimes one and sometimes another dominating the process.

Each of these paradigms, to a certain extent, calls for its own analytical emphasis. For example, decision trees analysis is likely to be particularly relevant for the rational actor model, queuing theory and mathematical modeling for the process model, and probability analysis for the political model.

Conclusion

Decision making is a process combining analytical concepts, the personal attributes of the people involved, and organizational dynamics. A decision maker has to take all three into account.

The analytical element typically provides a good place to start. It defines the relevant information and the kind of solution that can be gained. Assessing the organizational challenges—for example, identifying who is likely to support or oppose various solutions—would come next. The selection of people to involve in the decision-making effort would follow from the specific requirements uncovered in the analytical and organizational assessments.

A cook who has made a cake many times will toss in the ingredients with a certain carelessness brought about by experience. Yet this same cook will bring out the measuring scale when faced with a new unfamiliar recipe. Managers need a method for approaching new situations. A knowledge of quantitative methods and of decision analysis provides that kind of support.