

Decision By Objectives

(How to convince others that you are right)

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"Not everything that counts can be counted and not everything
that can be counted, counts" – Albert Einstein

Dedication/Acknowledgments

To our family, friends, colleagues, teachers and students:

We dedicate this book to, and acknowledge those who have come before us; those whose paths have crossed ours, both directly and indirectly; and those who have shared their ideas with us and have permitted us to share our ideas with them.

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Chapter 1

Introduction: Management Decision-Making Today

Decision-making is a process of choosing among alternative courses of action in order to attain goals and objectives. Nobel laureate Herbert Simon wrote that the whole process of managerial decision-making is synonymous with the practice of management.¹ Decision-making is at the core of all managerial functions. Planning, for example, involves deciding what should be done? When? How? Where? By whom? Other managerial functions, such as organizing, implementing, and controlling rely heavily on decision-making.

Today's fast changing and global environment dictates that a successful enterprise have a rich decision-making process. This means not only gathering and processing data, but also making decisions with the support of state-of-the-art decision methods. Decision-making is the very foundation of an enterprise, and sound decision-making is absolutely necessary for gaining and maintaining a competitive advantage.

In many enterprises the decision process entails great time and effort in gathering and analyzing information. Much less time and effort go into evaluating alternative courses of action. The results of the analyses (there are often many, for example financial, marketing, operations, and so on) are intuitively synthesized to reach a decision. Research has shown that although the vast majority of everyday decisions made intuitively are adequate, intuition alone is not sufficient for making complex, crucial decisions. Organizations that use modern decision support methods can gain and maintain a competitive edge in leading and managing global business relationships that are influenced by fast changing technologies and complicated by complex interrelationships between business and governments.

¹ Herbert A. Simon, *The New Science of Management Decision* (New York: Harper & Row, 1960), pp. 40 - 43.

This book will help you learn and apply methods to gain and maintain a competitive edge.

Specifically, this book will help you to:

- Prioritize
- Evaluate alternatives
- Allocate resources
- Deliver powerful presentations
- Justify/defend recommendations
- Make meetings more effective
- Improve communications
- Achieve consensus
- Eliminate fifty percent of your business worries

The Need for Better Decision-making

Few people today would doubt the importance of relevant information when making vital decisions.

Yet many people are unaware of the need for a logical approach to the decision itself. They consider it sufficient to collect data, analyze the data, and then simply “think hard” in order to arrive at a good decision. They use seat of the pants approaches or simplistic strategies for analyzing their decisions. In his book, Crucial Decisions, Irving Janis provided evidence that “A poor-quality decision-making process (which characterizes simplistic strategies) is more likely than a high-quality process to lead to undesirable outcomes (including disastrous fiascos).”² He asserted “When all vital decisions are made on the basis of a simplistic strategy, the gross misperceptions and miscalculations that remain uncorrected are likely to lead to disaster sooner or later — usually sooner rather than later.”³

There are some who have already recognized the need for what Janis called vigilant decision-making. Janis stated: “When executives are asked how they go about making the most consequential decisions, some of them

² Irving L. Janis, *Crucial Decisions — Leadership in Policymaking and Crisis Management* (New York: The Free Press, 1989), p 287.

³ Janis, *Crucial Decisions*, p. 89.

acknowledge that when they believe the stakes are really very high, they do not stick to the seat-of-the pants approach that they ordinarily use in daily decision-making. In fact, their accounts of what they do in such circumstances are not very different from the analytic problem-solving approach recommended in most standard textbooks in management sciences.” One of the difficulties in using the analytical problem solving approaches found in management science textbooks, however, is that they are predominantly quantitative approaches — incapable of incorporating the qualitative factors so important in vital decisions. We will, in this book, look at and resolve the quandary posed by the need to synthesize quantitative and qualitative factors in a decision process. We will come to understand what Albert Einstein meant when he said (in a letter to President Roosevelt) “Not everything that counts can be counted and not everything that can be counted, counts.”

Decision-making ability is the most important business skill

Decision-making is undoubtedly the most difficult and most essential task a manager performs⁴. Executives rate decision-making ability as the most important business skill, but few people have the training they need to make good decisions consistently. In their excellent book, *Decision Traps*⁵, Russo and Shoemaker point out that becoming a good decision-maker requires coaching just like becoming a good athlete. Coaches have learned that excellent athletic performance depends on techniques that *can* be taught. Some of these techniques are counter intuitive and therefore extremely difficult to learn by trial and error. Experienced golfers love to watch athletic baseball players step up to the tee and swing as hard as they can, only to miss the ball completely. A golf instructor can quickly teach the athletic baseball player what is not intuitive — that the left arm (for a right-hander) should be kept almost straight, unlike during a baseball swing, and that swinging easier will usually make the golf ball go further. Techniques like ‘keeping your head down’ (or ‘eyes on the ball’), work well in several

⁴ C. H. Kepner and B. B. Tregoe, B.B. *The Rational Manager: A Systematic Approach to Problem Solving and Decision-Making*, McGraw Hill, New York, NY, 1965.

⁵ Russo, J. Edward and Shoemaker, Paul J. H., *Decision Traps*, Doubleday, New York, N.Y., 1989.

sports, like golf, tennis and baseball. But someone who has not played any of these sports will intuitively ‘lift’ their head to see where the ball is going before the swing is completed.

Decision-making skills can also be taught. Common mistakes when making crucial decisions, like those in Table 1, can be avoided using some fairly simple methods and techniques.

Table 1 – Common mistakes when making crucial decisions

1. Plunging in	Gathering information and reaching conclusions without thinking about the crux of the issue or how decisions like this one should be made
2. Frame blindness	Setting out to solve the wrong problem because your framework causes you to overlook attractive options or lose sight of important objectives
3. Lack of frame control	Failing to define the problem in more ways than one, or being unduly influenced by the frames of others
4. Overconfidence in your judgment	Failing to collect key factual information because of overconfidence in your assumptions and opinions
5. Shortsighted shortcuts	Relying on ‘rules of thumb’ for crucial decisions, or on the most readily available information
6. Shooting from the hip	Trying to keep straight in your head all the information relating to the decision rather than relying on a systematic procedure
7. Group failure	Assuming that a group of smart people will automatically make a good decision even without a good decision process
8. Fooling yourself about feedback	Failing to learn from evidence of past outcomes either because you are protecting your ego or because you are tricked by hindsight
9. Not keeping track	Assuming that experience will make lessons available automatically
10. Failure to audit your decision process	Failing to create an organized approach to understanding your own decision process

When things get tough

Good decision-making is a luxury when business is booming or budgets are expanding. However, when things get tough, good decision-making is a necessity. Bill Wolman, Chief Economist Businessweek and CNBC, has said “Any idiot can manage during inflation (when the economy is growing). At times like these it takes good management and when good management is required, I get nervous.” W. Edwards Demming, father of TQM, observed that “A declining market exposes weaknesses: Management in an expanding market is fairly easy. It is difficult to lose when business

simply drops into the basket. But when competition presses into the market, knowledge and skill are required for survival.”⁶

Tradeoffs

Reaching a decision will ordinarily involve making trade-offs among the objectives relating to a decision – a difficult and poorly understood aspect of decision-making. Decisions become difficult when they involve several competing objectives. The greater the number of objectives – the more complex the decision.

People have a poor understanding of how they make trade-offs

Research conducted over the past quarter century has demonstrated conclusively that people have a poor understanding of how they make such trade-offs.⁷ Experimental evidence has shown that “people do find it difficult to make consistent judgments when more than one attribute is involved,” and therefore there is “a strong argument for providing some structured means of helping them ‘think through’ their choices.”

BOGSAT

The most frequently used method for decision method today is what is sometimes referred to as the *BOGSAT* – a **B**unch of **O**ld **G**uys/**G**als **S**itting **A**round **T**alking). Even though there may be considerable preparation for a *BOGSAT*, including information-gathering, and detailed analyses (e.g., financial, marketing, technical, political, etc.), there are numerous problems with this approach. According to Peter Beck, “These sessions are often dominated by the leader and rarely facilitated. The leader sets the tone and is often not challenged. If the group starts down the wrong path they rarely look back.”⁸ The *BOGSAT* is so universal that your competitors have most likely

⁶ W. Edwards Demming, “Transformation of Western Style of Management”, in P.R. Krishnaiah and C. R. Rao, eds. *Handbook of Statistics*, Vol. 7, Elsevier Science Publishers, 1988.

⁷ R. L. Cook, and K. R. Hammond, “Interpersonal Learning and Interpersonal Conflict Reduction in Decision-Making Groups.” in *Improving Group Decision Making in Organizations: Approaches from Theory and Research*. New York: Academic Press, 1982), p. 19.

⁸ Discussion with Peter Beck, Decision Technology, Arlington, VA.

been using it as well – so you may not have yet been at a competitive disadvantage. However, times are changing and many organizations have been abandoning the BOGSAT in favor of more capable methods. Before looking at these methods, let's first consider why BOGSAT decision-making is inadequate.

Cognitive limitations

Psychologists have proven time and time again that the human brain is limited in both its short-term memory capacity and its discrimination ability (channel capacity) to about seven things.⁹ A BOGSAT discussion typically involves dozens of 'things', e.g., issues, alternatives, pros, cons, objectives, criteria, etc. Then what do we do?

Satisficing

Bazerman¹⁰ points out that the economist's model of the rationality assumes that decision-makers following the following logical steps with perfect judgment:

1. Perfectly defining the problem
2. Knowing all relevant information
3. Identifying all criteria
4. Accurately weighting all the criteria according to his/her goals.
5. Accurately accessing each alternative on each criterion.
6. Accurately calculating and choosing the alternative with the highest value

However, Herbert Simon claims that humans lack both the knowledge and computational skills necessary to make decisions in a manner compatible with economic notions of rational behavior¹¹. Simon refers to this as bounded rationality.

We argue that decision-making for *every* complex, crucial decision takes place under constraints of human information-processing limitations.

⁹ See discussion on page 6.

¹⁰ Max Bazerman, *Max H., Max H., Max H., Max H., Max H. Judgment In Managerial Decision Making*, John Wiley & Sons, 1986.

¹¹ Hogarth, Robin, *Judgment and Choice*, John Wiley & Sons, New York, 1987. p62.

What do people do when confronted with these limitations? Hogarth explains:

“Simon has suggested several strategies that people use to reduce the cognitive demands of decision-making in order to make ‘reasonable’ decisions. First, people delimit the scope of the decision problem by imposing constraints, that, conceptually at least, can be thought of as eliminating whole regions of the payoff matrix. In other words, people consider only part of the total decision problem. Second, people simplify the evaluation of outcomes by, in essence, seeking to characterize whether outcomes are or are not acceptable. The key concept is that of an *aspiration level*. That is, prior to learning of the levels of outcomes that can be reached by taking different actions, the decision-maker is assumed to fix a level to which he or she aspires and which is acceptable. It is important to note that adopting aspiration levels reduces the need to search for information to evaluate alternatives and possible states of the world. This strategy therefore considerably reduces the need for and processing of information.”

“The use of aspiration levels is thus the primary mechanism by which people can reduce the costs of information processing and yet still act in a purposeful manner. However, the use of aspiration levels is not without its costs. In Simon’s model, the aspiration level is a device used to simplify choice. Its use suggests a willingness to balance the quality of a decision against the cost, and frequently impossibility, of being able to engage in more extensive analysis.”

The use of aspiration levels, or what Simon referred to as *satisficing*, is a non-compensatory decision-making approach because an alternative that does not meet one of the aspiration levels cannot compensate with superior performance with respect to other objectives. Satisficing is but one of the common simplistic strategies identified by Irving Janis, in his book *Crucial Decisions - Leadership in Policymaking and Crisis Management*¹².

Common Simplistic Strategies

Janis identified different categories of rules that people use as strategies to cope with their constraints. These include cognitive decision rules, affiliative decision rules, and self-serving / emotive rules.

¹² Irving L. Janis, *Crucial Decisions - Leadership in Policymaking and Crisis Management*, The Free Press, New York, N.Y., 1989.

Cognitive Decision Rules

Cognitive decision rules are used to cope with cognitive limitations of the human mind, insufficient time for deliberation, limited organizational resources for information gathering, and related problem-solving constraints. These rules, which simplify the intellectual tasks posed by complicated problems that confront executives who make important decisions, include:

Satisficing

Satisficing entails establishing aspiration levels and then settling for an alternative (often the first) that satisfies those aspiration levels. Suppose you were to relocate from the Midwest to the San Francisco area and wanted to purchase a house somewhat comparable to what you now have — a five bedroom, three bathroom house, on a 2 acre piece of land, 5 minute drive from work, in a very good school district. The estimated value of your house is \$175K. You realize that a comparable house in San Francisco would be much more expensive, but your salary will be a bit larger after the move. When you visit San Francisco to look for a house, you are really disappointed. Four bedroom houses within a 15-minute commute are selling for \$400K and up. So you begin adjusting your aspiration levels. Four bedroom houses within a 30-minute commute are selling for \$350K and up. You really don't want to pay more than \$300K. A Realtor shows you some houses priced around \$300K, but they are 45 minutes drive from your new office. You say that is too far, how about three bedroom houses? You continue to adjust your aspiration levels, as a function of what you see available. When you 'finally' see a house that satisfies those aspiration levels, you make an offer (the Realtor tells you that if you don't make an offer right away, the house is likely to be sold to someone else.) A better strategy would be to continue to look until you find *several* houses that meet your objectives in different ways. One might be larger, but further from the office. Another might be newer but cost more. A decision considering the tradeoffs of alternatives is almost certain to result in a better choice.

Analogs and Adages

Why don't we do something similar to what we did last time a similar decision was made? Or, when in doubt, go with your first hunch. How often are crucial decisions made this way? What if the circumstances or the business environment has changed enough so that the analogy is no longer valid? What if the analogy is still valid, but the last decision was actually a poor choice that worked out well only by chance?

Nutshell Briefing

Busy top-level executives often ask for a 'nutshell' briefing, and then decide. How much can you fit in a nutshell? Perhaps not enough for a particularly crucial decision.

Incremental Change

It's very easy and comforting to stick closely to the last decision bearing on an issue, making only slight changes to take care of the most urgent aspects of the problem currently at hand. Easy, but dangerous for crucial decisions.

Consensus

It is desirable to achieve consensus on a decision so that those involved will make strong efforts to implement the decision. But for crucial decisions, consensus might not be enough to overcome the choice of a bad alternative.

Affiliative Decision Rules

Affiliative decision rules like avoiding punishment (the old CYA principle), following the party line, rigging meetings to suppress the opposition¹³, and preserving group harmony are sometimes helpful for everyday decisions, but not for crucial decisions.

¹³ The opposition might have some important insights that are valuable during the decision formulation and structuring stages — but not during the alternative evaluation stage.

Self Serving and Emotive Rules

Self serving and emotive rules like rely on gut feelings, retaliating (don't get mad, get even), we can do it! (even if its not the best thing to do), or Wow! Grab it before the opposition does it – are dangerous rules to use for crucial decisions.

Unimportant vs. Crucial Decisions

Janis concluded that “Relying on a few such rules of thumb might generally work out fairly well when making routine choices or dealing with minor relatively unimportant decisions; however, when executives rely upon such rules to make important decisions, they save time and effort at the cost of risking being stuck with an ill-conceived choice entailing disastrous consequences that could have been avoided.”¹⁴ We are not advising that the above common simplistic strategies be abandoned – many of them are not only useful, but also essential for the thousands of minor decisions each of us makes every day. However for *CRUCIAL DECISIONS*, they should be carefully avoided. This requires a *change* in the way crucial decisions are made in most organizations.

Unfreeze, change, refreeze

According to Lewin¹⁵, in order for a *change* in a system to occur and last over time, it is necessary to (1) get the system to “unfreeze” (from existing processes), (2) change, and (3) “refreeze,” making the change part of the system's standard repertoire. Without unfreezing and refreezing, change is not expected to take place successfully and last over time. In working with a Vice President of a Fortune 500 industrial firm, we helped initiate a change to the way resources were allocated to proposed R&D projects. The VP, while personally satisfied with the change, asked his staff what they thought of the new process. Most of the comments were “It's OK, but that's not the way we do things around here.” Sticking with the new process, the

¹⁴ Irving L. Janis, *Crucial Decisions*, Op. Cit.

¹⁵ K. Lewin, (1947) Group decision and social change. In T. M. Newcomb and E.L. Hartley (Eds.), *Readings in social psychology*, New York: Holt, Rinehart and Winston.

next year comments changed to “Good process – we did it that way last year.” The third year comments were “Fine – that’s the way we’ve always done it.”

Resistance to Change

But it is not easy to bring about change in the way executives address crucial decisions. Bazerman¹⁶ noted that because many successful executives rose to the top using their intuitive strategies they are resistant to any information that his/her judgment is deficient in some observable manner. This judgment has usually included the intuitive use of common simplistic strategies for crucial decisions. Thus, while improving intuition should be an important activity for successful managers, cognitive resistance to change is a predictable pattern. Can this resistance be overcome? If so, how?

Requisites for Change

A crisis is necessary to induce successful, busy executives to change the way decisions are made. Unfortunately, crises are often not appreciated until it is too late. The number of Fortune 500 companies of twenty years ago that are no longer on the list, some of which are no longer in *existence*, is ample evidence. But the crises of today and tomorrow abound, such as budget cutbacks, increased competition from abroad, technological innovations, changing demographics and lifestyles.

Change to what? A methodological process that focuses on the achievement of objectives

It’s easy to say we should change the way we make crucial decisions as individuals or in groups, but what should we change to? After studying the decision-making research and applications conducted over the past fifty years or so, the methodology that has emerged as theoretically sound,

¹⁶ Max H. Bazerman, *Judgment In Managerial Decision Making*, John Wiley & Sons, 1986

practical, and widely successful, and the methodology we will focus on in this book, is called the Analytic Hierarchy Process (AHP).

In the late 1960's, Thomas Saaty, a world renowned mathematician, one of the pioneers of Operations Research, and author of the first Mathematical Methods of Operations Research textbook and the first queuing textbook, was directing research projects for the Arms Control and Disarmament Agency in the Department of State. His very generous budget allowed him to recruit some of the world's leading economists and game and utility theorists¹⁷. Saaty later recalled¹⁸:

Two things stand out in my mind from that experience. The first is that the theories and models of the scientists were often too general and abstract to be adaptable to particular weapon tradeoff needs. It was difficult for those who prepared the U.S. position to include their diverse concerns and to come up with practical and sharp answers. The second is that the U.S. position was prepared by lawyers who had a great understanding of legal matters, but [who] were not better than the scientists in accessing the value of the weapon systems to be traded off.

Years later, Saaty was troubled by the communication difficulties he had observed between the scientists and lawyers and by the lack of any practical systematic approach for priority setting and decision-making. Having seen the difficulty experienced by the world's best scientists and lawyers, Saaty was motivated to attempt to develop a *simple* way to help ordinary people make complex decisions. The result was the Analytic Hierarchy Process (AHP). The most difficult thing about AHP is its title, so lets look at the meaning of each of three words, Analytic, Hierarchy, Process.

AHP focuses on *the achievement of objectives*. Its use will lead to "rational decisions" according to the following definition: A rational decision is one which best achieves the multitude of *objectives* of the decision maker(s). The key will be to focus on *objectives*, rather than alternatives, criteria or attributes.

¹⁷ Three of whom, Gerard Debreu, John Harsanyi, and Reinhard Selten, have since won the Nobel Prize.

¹⁸ Saaty, Thomas L., *Decision Making with Dependence and Feedback*, RWS Publications, Pittsburgh, PA, 1996, p 12.

The Analytic Hierarchy Process

Analytic

Analytic is a form of the word analysis, which means the separating of any material or abstract entity into its constituent elements. Analysis is the opposite of synthesis, which involves putting together or combining parts into a whole. Many organizations have departments or divisions with the word analysis in their title. We speak of financial analysis, marketing analysis, and process analysis. Organizations have become quite good at doing analysis. Few organizations, however, know how to synthesize! In a sense, AHP should really be called the *Synthesis* Hierarchy Process because at its core, AHP helps us measure and synthesize the multitude of factors involved in complex decisions.

Hierarchy

How can humans best deal with complexity? Herbert Simon, father of the field of Artificial Intelligence and Nobel laureate, writes:¹⁹

“Large organizations are almost universally hierarchical in structure. That is to say, they are divided into units which are subdivided into smaller units, which are, in turn, subdivided and so on. Hierarchical subdivision is not a characteristic that is peculiar to human organizations. It is common to virtually all complex systems of which we have knowledge. The near universality of hierarchy in the composition of complex systems suggest that there is something fundamental in this structural principle that goes beyond the peculiarities of human organization. An organization will tend to assume hierarchical form whenever the task environment is complex relative to the problem-solving and communicating powers of the organization members and their tools. Hierarchy is the adaptive form for finite intelligence to assume in the face of complexity.”

In his book on “Hierarchical Structures” L.L. Whyte expressed this thought as follows:

“The immense scope of hierarchical classification is clear. It is the most powerful method of classification used by the human brain-mind in ordering experience, observations, entities and information. The use of

¹⁹ Simon, Herbert A., *The New Science of Management Decision*, Harper and Brothers, New York, N.Y., 1960.

hierarchical ordering must be as old as human thought, conscious and unconscious.”²⁰

Process

A process is a series of actions, changes, or functions that bring about an end or result. The Analytic Hierarchy Process (AHP) is *not* a magic formula or model that finds the ‘right’ answer. Rather it is a process that helps decision-makers to find the ‘best’ answer. We will discuss AHP in more detail shortly.

²⁰ L.L. Whyte, *Hierarchical Structures*, American Elsevier, New York, N.Y., 1969.