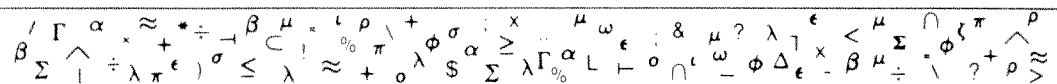


Creativity in MS/OR: Value-Focused Thinking—Creativity Directed toward Decision Making

RALPH L. KEENEY

University of Southern California
Los Angeles, California 90089



The purpose of creative thinking is to develop novel and unusual ideas. These ideas could be objectives, problem definitions, or solution alternatives. To succeed, one must follow the two most important rules for creative thinking: defer judgment, and produce large quantities of ideas. By deferring judgment, one avoids self-criticism, which is the most detrimental psychological block to being creative. One must be able to separate imagination from judgment. The logic of “quantity first” is simple: the more ideas one has, the better they are likely to be.

One key principle of creative thinking that differs from those for conventional problem solving is to separate idea generation from idea evaluation and idea selection. In this guest column, Ralph Keeney proposes “value-focused thinking” as a means of generating alternatives for decision problems and of identifying decision opportunities where time and effort could be productively invested.

James R. Evans, University of Cincinnati

Conventional approaches to decision making focus on alternatives. However, alternatives are relevant only because they are means to achieving values. Thinking about decision situations should therefore focus on values, as values provide the fundamental reason for any interest in a decision. Value-focused thinking is a philosophical approach for guiding and integrating your decision-making activities. Its

logical foundations are concepts and procedures that allow you to articulate and thoroughly appraise your fundamental values in a decision situation and to use these values to create better alternatives for your decision problems and to identify decision opportunities more appealing than the decision problems that confront you.

Most people do not like problems, and since decisions are problems to most peo-

ple, they typically do not create their own. Instead, decision problems are usually thrust upon them by others or by happenstance. If your firm no longer needs your services, you have a decision problem. If consumers are not purchasing your product as expected, you have a decision problem. If you are diagnosed as having a serious illness, you have a decision problem. If hurricanes hit a populated area, many decision problems arise.

Once the decision problem is imposed from outside, the so-called solving begins. Typically, a decision maker first focuses on alternatives, until he or she finds either an appropriate set of alternatives or one acceptable one. Only then does the decision maker begin to concentrate on objectives or criteria to evaluate the alternatives. I refer to this general problem-solving approach as alternative-focused thinking.

Focusing on alternatives is a limited way to think through decision situations. It is reactive, not proactive. If you wish to be the master of your decision making, it makes sense to have more control over the decision situations you face. You do not control decision situations that you approach using alternative-focused thinking. This standard mode of thinking is backwards, because it puts the cart of identifying alternatives before the horse of articulating values.

Almost all of the literature on decision making is based on alternative-focused thinking. It concerns what to do after the crucial activities of identifying the decision problem, creating alternatives, and specifying objectives. But where do these decision problems, alternatives, and objectives come from? More importantly, where

should they come from?

It is values that are fundamentally important in any decision situation. Alternatives are relevant only because they are means to achieving your values. Thus your thinking should focus first on values and later on alternatives that might achieve them. Naturally there should often be iteration between articulating values and creating alternatives, but the principle is "values first." Such thinking, which I refer to as value-focused thinking, can significantly improve decision making because the values guide not only the creation of better alternatives but the identification of better decision situations. These better decision situations, which you create for yourself, should be thought of as decision opportunities rather than as decision problems.

Articulating Values

The values that are of concern in a given decision situation are made explicit by the identification of objectives, so this process is crucial. However, there is a serious lack of structured approaches to promoting systematic and deep thinking about objectives. All decision gurus, from Franklin [1772] to Kepner and Tregoe [1965], tell you to "list your objectives" somewhere in their decision-making schemes. But they do not clearly address what objectives to list, how to go about listing them, or how to use them. Simply listing objectives is important but shallow. Identifying, structuring, analyzing, and understanding objectives is much deeper. If you really care about a decision, objectives are worth deep and serious thought.

The process of identifying objectives requires significant creativity and hard thinking about a decision situation. Begin an it-

erative process by asking “What would you like to achieve in this situation?” Write down a list of your responses. Then push yourself to think of anything else that should be on the list. Your thoughts will likely identify many issues and concerns

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relevant to objectives. Thoughts about trade-offs, consequences, impacts, fairness, equity, concerns, and so forth can stimulate questions that make implicit objectives explicit. For example, if you think trade-offs are necessary, identify precisely what trade-offs there are. The responses suggest additional objectives for your list.

After you have a preliminary list of your objectives written down, scrutinize each one carefully. First ask why each objective is important. The responses will probably add objectives to your list. Suppose you are identifying potential sites for a new regional distribution center for your products. One objective that readily comes to mind is to minimize the transportation required to service the numerous retail outlets in the region. Thinking about why this is important, you may decide that less transportation is a means to lowering operating costs, to fulfilling orders more quickly, and to reducing the loss of goods from outdating (spoilage or fashion changes) or theft. Each of these objectives should also be subjected to the “why is it important” test. For example, fulfilling orders quickly should lead to increased sales and to being more competitive. Fewer lost

goods should lead to lower operating costs. At this stage, you recognize that less transportation should be evaluated in terms of its implications for lower operating costs, increased sales, and increased competitiveness. These objectives are more fundamental than transportation distance, and they are influenced by factors related to the distribution site other than transportation distance. For example, an additional means of reducing the loss of goods is to minimize transportation accidents, which suggests an additional fundamental objective—to maximize safety. Transportation safety is important partly for its impact on operating costs, but it is fundamentally important because of the desire to avoid loss of life and injury to employees and the public.

The general principle in thinking about values is to discover the reasoning for each objective and the way it relates to other objectives. Values are identified by examining the responses to a large number of questions about the meaning of and reasoning for objectives. Each response can be considered to be a “value bit” of information useful in guiding value-focused thinking. Any of these value bits may suggest the insight that leads to the breakthrough thought that eventually enables the decision maker to make a much better choice than would otherwise have been possible. Taken together, the value bits should indicate everything you really care about in a decision context.

Creating Alternatives

The range of alternatives people identify for a given decision situation is often unnecessarily narrow. There are several reasons for this. There is a tendency in all problem solving to move quickly away

from the ill-defined to the well-defined, from constraint-free thinking to constrained thinking. People need to feel, and perhaps even to measure, their progress toward reaching a "solution" to a decision problem. To get that feeling of progress, they often quickly identify some viable alternatives and proceed to evaluate them, without making the effort to broaden the search for alternatives.

The first alternatives that come to mind in a given situation are the obvious ones, those that have been used before in similar situations and those that are readily available. Once a few alternatives are stated, they serve to anchor thinking about others. Assumptions implicit in the identified alternatives are accepted, and the generation of new alternatives, if it occurs at all, tends to be limited to a tweaking of the alternatives already identified. Truly creative or different alternatives remain hidden in another part of the mind, unreachable by mere tweaking. Deep and persistent thought is required to jar them into the consciousness.

To remove the anchor on narrowly defined alternatives, value-focused thinking relies on the principle that alternatives should be created to best achieve the values specified for the decision situation. Both the qualitative objectives and the quantitative statements of values (for example, priorities) should be systematically probed to initiate creative thought. You should consider every objective: means objectives, fundamental objectives, and strategic objectives, and generate alternatives that would be very desirable if each objective were the only objective. Next, consider objectives two at a time, three at a time,

and so on. This process should provide a broad range of potential alternatives, most of which you would evaluate rather poorly on some objectives other than the ones for which they were invented. If this is not the case, you have not been very creative in generating the alternatives. Now, examine the alternatives you have generated to see if it is possible to combine any of them into a single alternative. Many of the alternatives that you have identified should be distinct from the standard anchors and some of these may be very desirable.

Decision Opportunities

Who should be making your decisions? The answer is obvious: You should. Well then, who should be deciding what decision situations you face and when you face them? The answer here is the same: You should. At least you should control far more of the decision situations you face than many of us do. Controlling the decision situations you face may have greater influence on achieving your objectives than does controlling the alternatives selected for the decisions.

There are two ways to create decision opportunities. One is to convert an existing decision problem into a decision opportunity. Often this involves broadening the context of the problem [Nadler and Hibino 1990]. This requires broadening the objectives by pursuing the reasoning that each objective is important. The objective in lowering the costs of your manufacturing process is to increase profits. There may be many opportunities to increase profits that do not involve lowering production costs.

The other way to create decision opportunities is from scratch. You use your creative genius, which can be stimulated by

value-focused thinking, to examine whether and how you can better achieve your objectives. The strategic objectives of an organization or of an individual are the foundation from which decision opportunities can be identified. But how many organizations, let alone individuals, have written down and organized their strategic objectives carefully? In how many organizations do the employees know and understand the organization's strategic objectives? The answer to both questions is "very few." The chance to state and clarify these strategic objectives is itself a decision opportunity. The British Columbia Hydro and Power Authority is one company that has examined its strategic objectives for decision opportunities [Keeney and McDaniels forthcoming].

The use of the strategic objectives to stimulate the identification of decision opportunities is complementary to the use of specific decision objectives to stimulate the creation of alternatives. To create alternatives, one considers objectives separately and asks "How can I do better with respect to this objective?" To identify decision opportunities, one considers strategic objectives separately and asks "Do I want to do better on this objective?" In some sense, we should always want to do better; a prioritization process must take place at this stage. We want to single out the decision opportunities where we have a better chance of making a substantial difference in achieving what we are aiming for. The intuitive stimulation from examining the strategic objectives is typically "I wish that . . ." or "I should . . ." Both suggest the bases to formulate decision opportunities.

Decision opportunities can be very help-

ful to you when you do not have direct control over a decision that you care about. You may wish to have a certain alternative selected, but a different decision maker has the power to make the decision. A firm wants its proposal to supply a product to another firm accepted, a government wants another government to sign an agreement, an executive wants his proposal for a leave of absence accepted by the organization, and so on. In this situation, you should recognize that you have the decision opportunity to take control of the decision situation. Instead of simply allowing the decision maker to choose an alternative that may not be the one you desire, you should create alternatives that modify your desired alternative so that it maintains its essential features for you and is better than the existing alternatives for the decision maker who will make the decision.

The key to "solving" a problem of this nature is to view it from the perspective of the decision maker. First structure her values as much as possible. Now you should be able to create modified alternatives that can improve matters in terms of her fundamental objectives while maintaining the key consequences that you desire. In many cases, the modified alternatives should be better than the status quo to the decision maker. It is worth noting that the strategic objectives of a decision maker are likely to be much broader than the set of fundamental objectives influenced by your desired alternative. Thus, an alternative distinct from the original alternative may be used to "satisfy" her when used in conjunction with the original alternative.

From your perspective, the decision al-

alternatives include the status quo and any others you can create. From the decision maker's perspective, the alternatives are the status quo and the alternative that you are suggesting. The problem may be characterized as an empathetic negotiation.

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You negotiate for the other side and make sure the decision maker gets enough to be willing to support your desired alternative, and you negotiate for your side as well. In simple terms, your goal is to create a win-win alternative.

Summary

Value-focused thinking provides you with a framework for thinking about decision situations. It is the structuring of thinking based on your values to address decision opportunities and problems in creative ways. Numerous procedures [Keeney 1992] can guide you in creating better alternatives for any decision problem you face, in identifying decision opportunities more appealing than the decision problems that confront you, and in articulating and using your fundamental values to integrate all of your decision-making activities. The ideas are relevant to your personal decisions and to the decision situations of firms, organizations, and governments.

Value-focused thinking differs from alternative-focused thinking in its purpose and thought processes. Alternative-focused thinking is used to solve decision problems. Value-focused thinking is a way to identify desirable decision situations and

then reap the benefits of these situations by solving them. Therefore, value-focused thinking suggests a paradigm for addressing decisions different from the standard alternative-focused thinking paradigm. It is different in three important ways. First, significant effort is allocated to articulating values. Second, this articulation of values in decision situations comes before other activities. Third, the articulated values are explicitly used to identify decision opportunities and to create alternatives. Using your values to stimulate thought about how to get what you care about makes good sense. It makes much better sense than trying to get what you care about without thoroughly understanding what it is that you care about.

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