

Developments in Business Simulation & Experiential Exercises, Volume 9, 1982

HEURISTIC AND SYSTEMATIC EVALUATION OF POLICY: EXPERIENTIAL EXERCISE IN DECISION MAKING

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ABSTRACT

Recent extension of policy analysis has added a tool to quantitative approaches in decision making for policy formulation and review. This approach does not use probability theory as have most quantitative techniques in decision theory but rather is based on direct estimates of importance value. It becomes possible to assess not only discrete choices in decision but also hierarchies of interrelated goals, sub-goals, policies and combinations of alternative actions numerically. Potential benefits include more complete formulations of strategic alternatives and means for executing them plus more penetrating consideration of interrelationships between means and ends in policy level decision making. This paper includes a conceptual schema for strategic decision analysis in formulating policy and provides a vignette for comparative analysis of intuitive and systematic reasoning as an experiential exercise in decision making.

Learning Objectives

1. To understand a policy analysis model designed to illustrate relationships between goals, sub-goals, functional policy areas and action alternatives in strategic management decision making.
2. To apply the policy model to a briefly presented organization and management situation requiring decision making and action planning.
3. To compare systematic with intuitive decisions and gain insight into how heuristic search, means-ends analysis, and progressive deepening enter as elements in the reasoning process of decision making.
4. To compare your decisions and reasoning with others in a group context and grasp insights into the specific issues, elements, values and limitations involved in the general problem of strategic policy formulation and decision making.

Advanced Preparation

Read the overview and the paper, "Heuristic and Systematic Evaluation of Policy." Do not read the procedures or exercises items until the class meets as a whole.

Overview

There is no simple method for determining what policy decisions are optimal. The decision which best serves one set of goals usually will not be appropriate for some other set of aims [1; 413]. Still when consulting business executives, it is common to find that they will agree to every plausible goal about which they are asked. They say they want to maximize profits while maintaining high levels of quality and dependable service, that they wish, in the bargain, to

avoid inefficiency and to maximize long-run sales. Unfortunately, it normally is impossible to serve all of such multiplicity of aims at once (5:186).

The purpose here is not to tell decision makers what their goals should be. The aims of business managers must be taken to be whatever they are (2:26). The central concern is to provide a method for finding the conclusions which follow from these goals, i.e., to describe what executives do to establish alternatives for achieving their goals, and to prescribe a method for evaluating them more efficiently. The procedure here is intended to provide policy makers a way for checking if they have been consistent in selecting those alternatives which best will achieve the overall goal (however defined) of business or organization policy.

The approach described is fundamentally quite simple and is reduced to elementary arithmetic. In application the number of steps can multiply, leading to an enormous calculation problem. Hence, a simplified example is used to illustrate the principle. But, it should be noted that the procedure is completely general and can be extended to larger policy situations (4:1).

HEURISTIC AND SYSTEMATIC EVALUATION OF POLICY

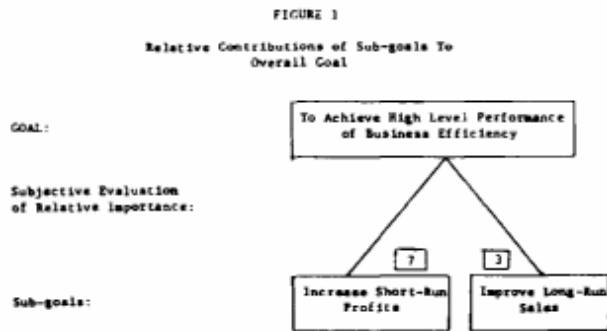
Suppose that a manager decides to pursue some overall business goal, e.g., to "achieve high level performance of business efficiency" (3). It does not matter how the overall goal is stated, so long as it can be acknowledged as highly important and complex (10). Assume that the chief business concern is with short-run operating costs, since these immediately are affecting the firm's earnings and competitive position. Also, there is a mounting concern about the rate of long-run improvements in sales.

In this overly simple example, two aspects can be broken out of the overall goal and identified as subgoals: (1) increase short-run profits and (2) improve long-run sales. Each is essential but perhaps not equally so. The firm's manager may be more concerned with increasing current profits. In fact, when asked to quantify the relative importance of these two subgoals, one might claim that "increasing short-run profits is over twice as critical as improving long-term sales." Let us say that when asked to divide 10 units of importance between these two sub-goals, the manager would give 3 to long-run sales improvement and 7 to increasing short-run profits (6:139). This evaluation is illustrated in Figure 1.

Expressing Sub-goals in Terms of Policies

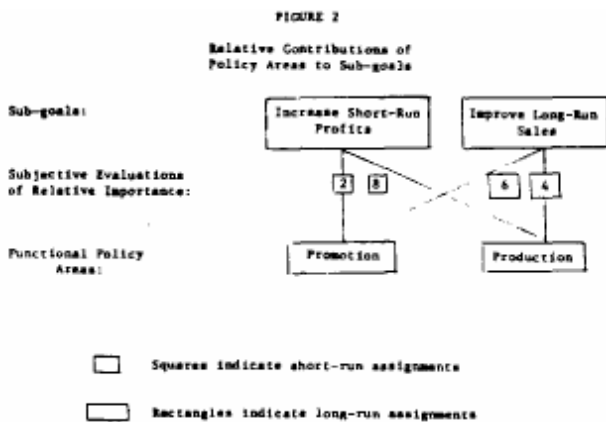
Now suppose the manager is concerned with only two areas of policy: (1) production operations and (2) promotion and marketing. While each area can make an important contribution to the sub-goals, the manager knows a decision will have to be made on the relative emphasis given to each. The question, then, concerns the relative importance of each of these areas in contributing to the achievement of the sub-goals (7).

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The manager might reason that while promotion could increase short-run profits, it would be more important in improving long-run sales. With respect to production, the manager might reason just the opposite, i.e., increased emphasis on economizing operations would result in reducing short-run costs and immediately add to short-run profits.

For the different sub-goals of improving long-run sales and increasing short-run profits, the relative contributions of the two policy areas, production versus promotion, could be entirely different. The manager might reason that promotion could lead to a complete breakthrough in market development, while emphasis on strengthening production would be influential principally in securing cost reductions and thereby increase current profits. So, when asked how he would divide 10 points between each policy areas in contributing to the sub-goal of increasing short-run profit, the manager might give 2 to promotion and 8 to production. However, for the sub-goal of improving long-run sales he might assign 6 to promotion and 4 to operation (9:1). These intuitive judgments are illustrated in Figure 2.



Expressing Policies in Terms of Alternative Actions

For simplicity, assume there are three alternative actions that can be taken in each policy area. With regard to production, the manager knows that alternatives are: (1) do nothing, (2) conduct cost reductions on new materials and supplies, and (3) institute new production procedures and techniques. Concerning promotion, the possible actions are: (1) do nothing, (2) develop new marketing outlets, and (3) devise new strategies for advertising campaigns. Now the manager will want to consult with employees in charge of production and promotion, asking them to consider the contribution of each possible action to the effectiveness of their assigned areas of policy responsibility (8:55). Suppose that when confronted with the same line of systematic questioning, the head of production judges that 10 points should be divided among the possible actions in this area by giving zero to “do nothing,” 4 to “conducting cost reductions on new materials and

supplies,” and 6 to the alternative of “instituting new production procedures and techniques.” Similarly questioned, the promotion manager might say that 3 should be given to the possibility of “developing new market outlets” and 7 to plans for “devising new strategies for advertising campaigns.” The importance of these actions to the functional policy areas is shown in Figure 3.

FIGURE 3
Relative Contributions of Alternative Actions to Functional Policy Areas

FUNCTIONAL POLICY AREAS:	Promotion	Subjective Evaluation of Relative Importance	Production	Subjective Evaluation of Relative Importance
	Take No Action		0	
Develop New Marketing Outlets	3		Conduct Cost Reductions on New Materials and Supplies	4
Devise New Strategies for Advertising Campaigns	7		Institute New Production Procedures and Techniques	6

Disparity and the Intuitive Decision

The manager may want to take all the alternative actions. But unhappily, business managers rarely are so fortunate. Suppose, then, that although these alternatives would cost different amounts, the manager can take any two of the above actions and not more. The decision is reduced to determining which actions to select in light of budgetary constraints.

One highly persuasive (and popular) approach would be to confer with the managers in charge of operations and promotion, in hopes of compromising their conflicting suggestions. It may appear that both have cogent reasons for taking the suggested actions. But the problem may still remain, i.e., each manager still may want to take action only in his or her area. The chief administrator could believe that a combination of actions involving the production manager’s high valued project for instituting new production procedures together with the promotion manager’s suggestion for devising new strategies for advertising is advisable. Assuming this compromise turns out to be the chief executive’s intuitive decision, there may be no consolation, only disparity, in resolving disagreements this way. The following procedure provides a useful check.

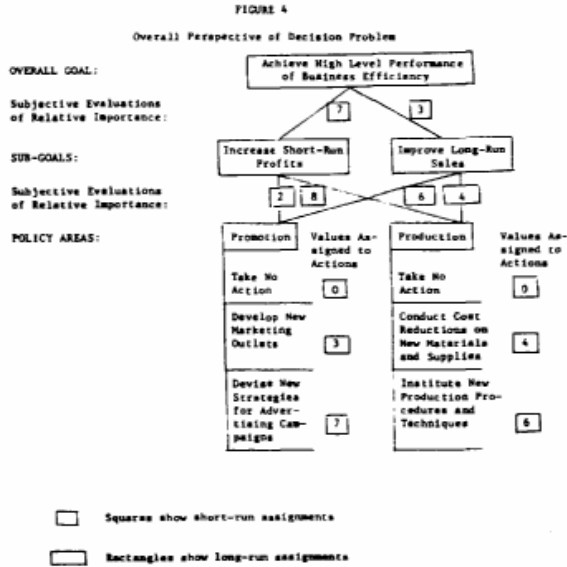
Systematic Method of Assessment

Figure 4 is a schematic overview of the complete decision question. It provides a method for checking the manager’s systematic versus intuitive reasoning.

The procedure is to multiply the contributions of any set of action alternatives to the respective policy areas by the relative importance of these areas to subgoals and, in turn, to multiply these by the relative importance values of sub-goals in servicing the overall goal. When this is done for any action set for both the short- and long-run, the sum will indicate the value of that set for contributing to the overall goal.

At first glance, the procedure may appear somewhat confusing; however, it is remarkably simple and can be made much clearer by an example. Let us evaluate the three sets of alternative actions that the business manager in our problem is confronted with. To evaluate each action set for its short- and long-run contribution to the overall goal, what our hypothetical manager has said is summarized in Tables 1, 2, and 3.

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It is possible, then, to evaluate each action by looking at the overall total values for each of the alternatives. Following the promotion manager suggestion of developing new marketing outlets and also devising new strategies for advertising campaigns indicates an overall value of 320. The production manager's recommendation of seeking to effect cost reductions on new materials and supplies and institute new production procedures and techniques is significantly higher; it gives a total value of 680. The "compromise" recommendation (the manager's intuitive decision) of combining the best actions from promotion and production yields 632 points. While this is a higher score than that for strictly pursuing promotion actions and lends support to the manager's hunch for favoring a compromise between promotion and production, it certainly falls short of what the manager regards as being most important.

Post-Decision Analysis and Implications

Does this mean that the general manager's hunch for placing balanced emphasis on promotion and production now logically is proven wrong, and that the manufacturing manager, who favored combining both of the alternatives in the production area, is right? Not necessarily, but a systematic calculation does contradict the executive's generally trusty intuition. This is the major advantage of the method--it provides a basis for comparing intuitive and systematic decisions.

TABLE 1
ALTERNATIVE 1: Promotion Only--Develop New Marketing Outlets and Devise New Strategies for Advertising Campaigns

	Assigned Values of Alternatives	Total Assigned Value for Policy Area	Importance of Policy Area to Sub-goals	Importance of Sub-goals to Overall Goal	Total Contribution
For Short-Term Value	7 + 3 = 10	x 2	x 7	= 140	
For Long-Term Value	7 + 3 = 10	x 6	x 3	= 180	
TOTAL VALUE OF ACTION ALTERNATIVE 1:					320

The disparity in the general manager's intuitive versus computed decision is due mostly to the importance of increasing short-run profits. Perhaps, in the intuitive decision, the general manager is willing to

TABLE 2
ALTERNATIVE 2: Operations Only--Conduct Cost Reductions on New Materials and Supplies and Institute New Production Procedures and Techniques

	Assigned Values of Alternatives	Total Assigned Value for Policy Area	Importance of Policy Area to Sub-goals	Importance of Sub-goals to Overall Goal	Total Contribution
For Short-Term Value	6 + 4 = 10	x 8	x 7	= 560	
For Long-Term Value	6 + 4 = 10	x 4	x 3	= 120	
TOTAL VALUE OF ACTION ALTERNATIVE 2:					680

TABLE 3
ALTERNATIVE 3: Promotion and Operations--Combination of Instituting New Production Procedures and Techniques and Devising New Strategies for Advertising Campaigns

	Assigned Values of Alternatives	Total Assigned Value for Policy Area	Importance of Policy Area to Sub-goals	Importance of Sub-goals to Overall Goal	Total Contribution
For Short-Term Value	(Promotion) 7 = 7	x 2	x 7	= 98	
(Operations) 6 = 6	x 8	x 7	= 336		
For Long-Term Value	(Promotion) 7 = 7	x 6	x 3	= 126	
(Operations) 6 = 6	x 4	x 3	= 72		
TOTAL VALUE OF ACTION ALTERNATIVE 3:					632

relinquish some of this importance by showing a balanced impartiality for the promotion and production managers; hence, the compromise choice. It always is difficult to be sure, but such contradictions are common in business policy and decision.

Procedure

Step 1: In class, read the case exercise "U-Reek-A Corporation." Individually, prepare your own policy model identifying the hierarchy of goal, sub-goals, policy areas and action alternatives posed by the problem(s) presented in the case. Briefly sketch a model outline and state explanations of your design.

Step 2: Review the model outline and element structure for U-Reek-A presented later in this paper. Note the differences and briefly account for them.

Step 3: From the worked out diagram of the policy model for U-Reek-A, review the alternative actions and rank them on the form, "Ranking of Alternatives for Selection." Next, assuming a total of 1000 points to be divided among the alternatives listed allocate points to actions according to the rank ordering you have given. Check to insure that points allocated exactly sum to 1000.

Step 4: Using the policy model presented for U-Reek-A, employ the systematic procedure for decision making learned from advance preparation for the exercise. Employ the programmatic schema for dividing 10 points between sub-goals in contributing to the goal, policy areas in contributing to sub-goals, and alternatives in contributing to policy areas. Evaluate each alternative action separately and rank them according to the systematically assessed point results on the form "Systematic Evaluation of Alternatives for Selection."

Step 5: Compare the intuitive ranking of alternatives with your more systematic evaluations of actions.

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Note where discrepancies and agreements occur; identify and explain what factors might account for the results.

Step 6: The class will divide into groups of six or more to:

1. Discuss and compare common and different insights.
2. Follow the model as presented for U-Reek-A and repeat Steps 3-5 seeking a group consensus ranking and evaluation of alternatives. Indicate this ranking on the second form for reporting group results.
3. Design an alternative and appropriate policy model from Steps 1-2 and develop a group consensus ranking and evaluation of alternatives.
4. Discuss the following points--intuitive vs. systematic reasoning in nominal vs. interacting groups; programmed vs. participative involvement in decision structures; individual vs. group logic and consistency in decision making; and merits vs. limiting assumptions of the policy and decision making procedure presented.

Step 7: Select one group to present an overview and critique of issues covered in Step 6-4 above with the entire class joining to discuss the exercise.

U-REEK-A CORPORATION

A paper company produces one particular kind of product at each of several of its mills. One of these, its #3 mill, is located in a relatively small community in which the mill is the major employer. The mill is quite small and inefficient by modern standards.

The mill produces excessive air pollutants (such as sulfides) to which humans are particularly sensitive at very low levels of concentration in the air. Further, spent liquors and wash from production are expended to produce a degree of water pollution.

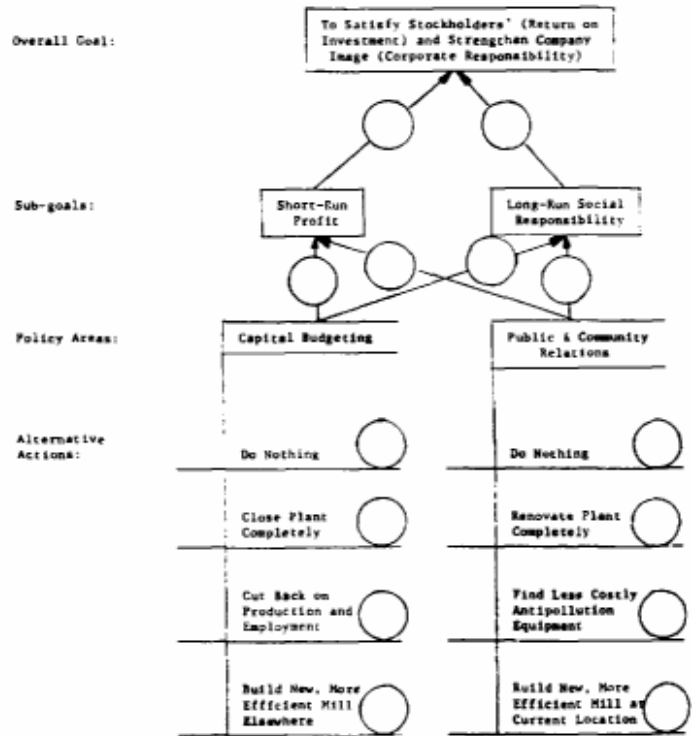
Although no known technology can eliminate all of these problems, control of pollution could probably be brought to acceptable levels if several million dollars worth of equipment were installed to monitor and control processes, preventing the creation of most of the undesired wastes. This investment might increase operating costs somewhat and would lower returns on an already depressed profit operation. Since the company has several plants that can produce the same products, and customer demand does not now require production at the #3 mill, management hesitates to install equipment into what is perceived as a marginal situation. Several studies have shown that for the same dollar investment a plant with three to four times the capacity of mill #3 could be equipped with pollution control equipment.

The company has received very few pollution complaints even though much of the time the local atmosphere literally reeks with offensive odors. Some managers reason that the townspeople believe that if complaints are made, they may result in a curtailment of plant operations and employment. Management wonders what the firm should do.

Conclusion

It is natural to ask what can be done with a procedure that only points out the inconsistencies policy makers have been experiencing for a long time. Where decisions are highly important, the method presented signals the need for managers to reconsider them. This can be accomplished by going back over decisions on an intuitive basis to see if decision makers come up with the same or similar choices. The result than can be rechecked using the procedure just outlined. Possibly, the numerical importances assigned to subgoals, policies, and actions were

POLICY MODEL FOR U-REEK-A



RANKING OF ALTERNATIVES FOR SELECTION

Alternatives:

- Build new, more efficient mill at current location
- Build new, more efficient mill elsewhere
- Find less costly antipollution equipment
- Cut back on production and employment
- Close plant completely
- Renovate plant completely
- Do nothing

Rank	Individual Ranking	Points Assigned
1st	_____	_____
2nd	_____	_____
3rd	_____	_____
4th	_____	_____
5th	_____	_____
6th	_____	_____
7th	_____	_____

TOTAL POINTS = 1000

not what were really intended, or maybe decision makers will modify their intuitive decision. As demonstrated from the exercise, others can be asked to employ the same procedure independently and/or in group effort to see where they differ.

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SYSTEMATIC EVALUATION OF ALTERNATIVES FOR SELECTION

Individual		Group	
Rank Ordering of Alternatives according to Point Evaluations	Points	Rank	Points
c	_____	_____	_____
d	_____	_____	_____
d	_____	_____	_____
h	_____	_____	_____
h	_____	_____	_____
h	_____	_____	_____
h	_____	_____	_____

This can serve to clarify understanding and sharpen insights about business policy without the attendant frustration of more cumbersome and complex techniques. In doing so, users will want to consider whether the actions listed were the only ones to be considered and whether there should be more of them or different ones. These, too, can be discussed with others, both in and outside a firm, using the same procedure to evaluate choices and check agreement. Interested participants will become keenly convinced of the usefulness and flexibility of this sort of systematic and simple technique for sharpening judgment and setting priorities in administering organization and business policy (4:7).

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- [4] King, Albert S., "Heuristics in Decision Making: A Validation Survey," Monograph Reprint Series, Northern Illinois University, Reprint No. 2, DeKalb, Illinois, January, 1979.
- [5] Liles, Patrick R., New Business Ventures and the Entrepreneur, Homewood, Illinois: K. D. Irwin, Publishers, Inc., 1974.
- [6] Litter, Joseph A., The Analysis of Organizations, Second Edition, New York: John Wiley and Sons, Inc., 1965. What the points represent is not as important as the requirement that they express judgment as to the degree of relative importance. Importance should be construed as expected future importance and ignore past and present levels of goal achievements.
- [7] Marell, R. W., Management: Ends and Means, San Francisco: Chandler Publishing Company, 1979.
- [8] Odiome, George S., Management By Objectives, New York: Pitman Publishing Corporation, 1965.
- [9] Robinson, Joan R., The Economics of Imperfect Competition, London: Macmillan and Company, Ltd. 1933. Consistent with the foregoing appraisal of goals and policies, managers should be asked to evaluate overall contributions of actions to policy areas considering only the additional value of proposed actions

and not the value of those actions which already have been undertaken.

- [10] Simon, Herbert A., "On the Concept of Organizational Goal," Administrative Science Quarterly, 9:1-22, June, 1964.
- [11] Obviously, for our trivial hypothetical case, one cannot conclude whether the director's 'intuited' or 'computed' decision is superior. This clearly is a matter for empirical investigation and cannot be resolved on the basis of any frivolous apriori considerations. Even for this "trumped- up" example, it is tempting to argue, however, that the disagreement between the intuited and computed decision arises from the general manager's failure to consider some sub-goal which was influencing his judgment, i.e., the psychological need for satisfying both the promotion and operation managers' suggestion.