MANAGEMENT UNDER COMPLEXITY

Gaming/Simulation as a Predecisional Tool

RICHARD D. DUKE
University of Michigan

This article confronts a problem now facing large organizations: how to develop, maintain current, and transmit a viable image concerning any complex issue requiring a policy decision. Six characteristics of this institutional management problem are given, as are seven traditional means of organizational response. Gaming/simulation is emphasized for its utility in solving this problem. A case study example at the federal level is described.

There is mounting evidence that major institutions, public and private, are finding increasing difficulty in developing a comprehensive self-image to guide policy decisions, and even more difficulty in gaining understanding and meaningful support for this view at the lower echelons of the organization.

Richard E. Meier forecast this development in the keynote address to the Tenth Annual Meeting of NASAGA (North American Simulation and Games Association) in Los Angeles in 1976. Addressing the question of future developments in gaming/simulation, he emphasized that accelerating change in

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the world would force major changes in institutional structure. Technological, economic, and political change would bring functional and structural change, through both diversification and abandonment of traditional activities. One manifestation of change would be an increase in the physical size of the organization (bureaucratic and corporate), which would lead to a weakening of identification of units (and individuals comprising units) with the parent corporation. A simultaneous and parallel development would compound the problem in that the myriad changes would also signal an increasing tempo or rate of change, bringing into sharp focus the need to plan ahead, to foresee the future. Meier believed that efforts by management to adjust to these new conditions would inevitably lead them to gaming/simulation through default; there simply are very few useful techniques available. Among the several possibilities, perhaps the disciplined use of gaming/simulation offers the most promise to management for achieving consensus on policy questions.

The characteristics of the institutional management problems are several:

(1) complexity along the several dimensions of finance and economics, technology and science, bureaucracy and administration, social problems and political reality, and so forth;
(2) a future-orientation which implies that precedent and the lessons of the past are of limited value;
(3) the lack of a clear paradigm for action, since no satisfactory model exists, either conceptual or pragmatic;
(4) the need for a dynamic process for closure on organizational overview, an interactive process which deals with the widely varying perceptions of the many actors in the dialog;
(5) the need to transmit each new (but temporary) perception of overview throughout the organization and, in turn, to accommodate to intelligent feedback which changes the perception; and finally
(6) the need to transmit a clear, unified image beyond the organization.

This problem of organizational management is not new, of course, but it has taken on some new dimensions and is gaining new urgency. The traditional techniques for obtaining, maintaining (modifying through time), and transmitting a coherent overview of complex reality are summarized in Figure 1. Seven broad categories are described: Gaming/Simulation, Education, Management, Theory, Scientific Study, Large-Scale Simulation, and Field Experience. Of course, these are not exclusive, and most actors have engaged in several of these approaches. Few, however, have participated in the full spectrum, and most have a world view (problem view) which is heavily influenced by some particular subset. For example, education is generally specific to some professional area, and each profession tends to view "reality" according to its own rules and conventions. Similarly, experience may "be the best teacher," but it can be unnecessarily confining when one attempts to define alternative futures. As a consequence, the several actors in any dialog are hindered not only by their differing organizational perspectives but also by their fundamental conceptual approach (see Figure 2).

Because the primary actors in the affected institutions are oriented along differing perspectives by their previous training, and because they are motivated by differing perceptions of reward within the structure, it becomes important to evolve a technique that is interactive, dynamic, and quick—interactive, in that it brings the actors into a productive exchange of ideas; dynamic, in that it changes in response to the cumulative perceptions of the participants; and quick, in that major policy issues often come unexpectedly and with a ferocity that demands attention.

There is a rapidly growing list of clients who elect to use gaming/simulation as a predecision policy tool. Among them is an array of private corporations and public agencies, both domestic and foreign. Perhaps experience with a recent client can serve as a useful example of gaming/simulation being used to resolve a policy issue. The world energy problem and the

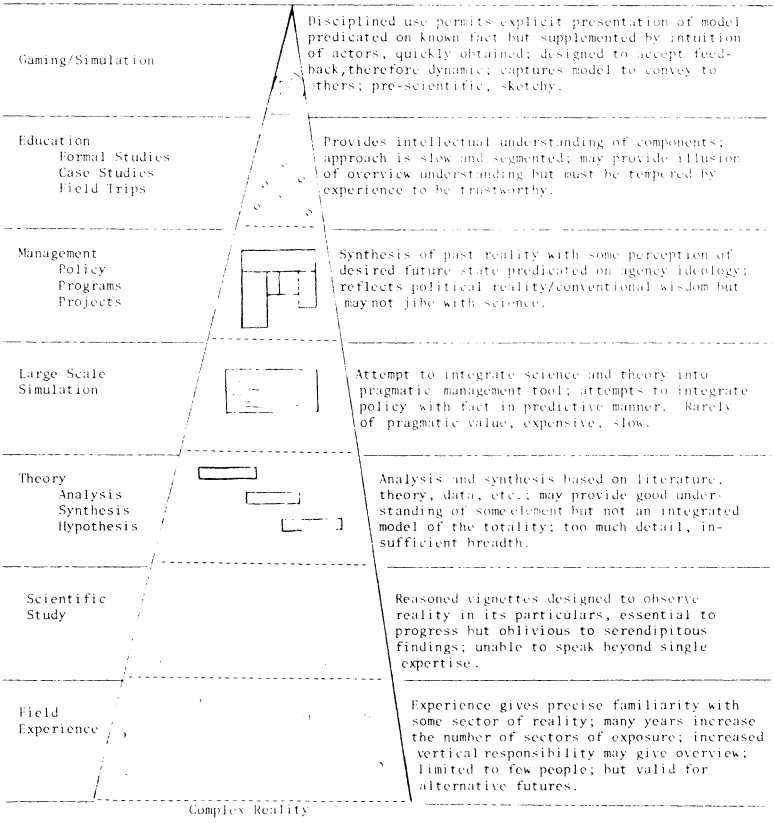

Figure 1 Established Procedures for Systematically Obtaining, Exchanging, and Conveying an Understanding of Complex Reality

more specific problem of the United States' own high level of foreign oil dependency have surfaced as one of the American public's primary concerns. Additional interest is generated by the public scrutiny and questioning of all public expenditures. At the legislative and administrative levels of government, program allocations are prioritized with respect to goals related to government economics and with increasing concern for national defense. Paradoxically, the logic in strategy is the

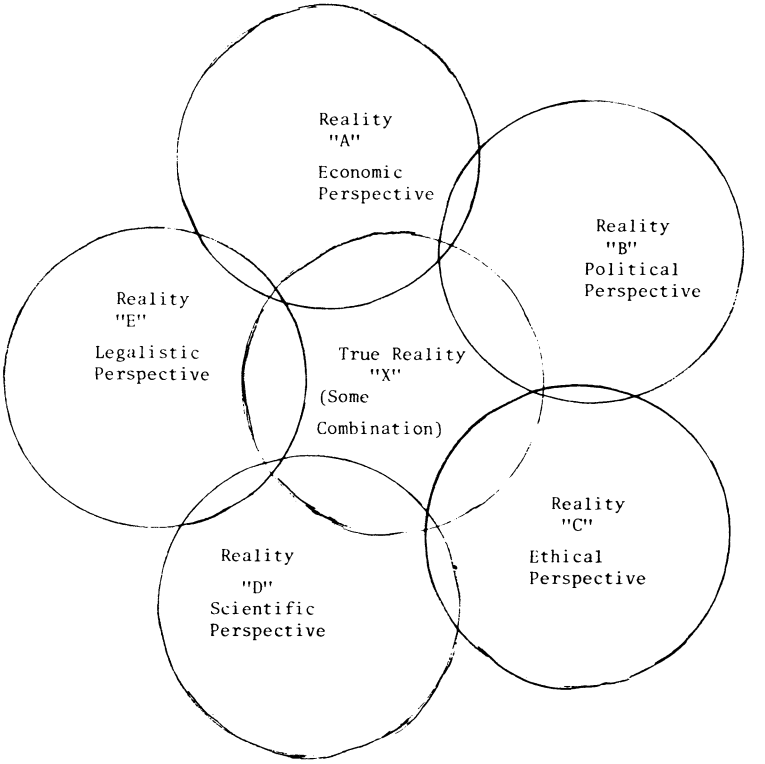

Figure 2 Different Perspectives of Reality

same for support of both the national energy program and the national defense program.

The secretarial level of the Department of Energy is charged with solving the energy problem and serves as the interface of the political and policy arenas. The perspective shifts as one proceeds downward through various bureaucratic levels. The first three levels (secretary, office, and division) are concerned with policy. The last rung of the formal DOE structure is the branch level, which oversees a number of project-oriented subprograms.

In July 1980 a meeting was held at Dulles Airport, Washington, D.C., for the purpose of formulating mutually acceptable measurement criteria for use in the development of an evaluation system for the Passive Solar Program of DOE. This was attended by representatives of all bureaucratic levels of the Department of Energy drawn from across the United States. A variety of gaming/simulation materials were prepared for use at this meeting: two brief scenarios were used to establish a national perspective; brief role descriptions to establish personal perspective (other than an individual's agency identification); and four decision forms: (1) The first form had players allocate DOE budget to application areas, (2) the second form required players to allocate budget to activity areas within an application area, (3) the third form was a record of the summations form 2, (4) the fourth form required players to view each project from the four major decision-making contexts of operations, planning, policy, and politics. The scenarios were of the present situation and of a second hypothetical situation in the next budget year with a new President in the White House. Their purpose was to force the players to consider evaluation procedures under pressure of great issues, rather than in the workaday world of routine operations. The roles described 20 national figures, including senators, mayors, and so on. Each participant was required to assume a role for the purpose of forcing consideration of an outside perspective. This was in recognition of two separate concerns. First, evaluation in the final analysis is perceived by individuals, not groups. Second, the different organizational levels tend to be focused on particular individual perspectives, sometimes providing a false emphasis to the activities at that level. The budget decision forms were mechanical aids used to focus the players on agency budget problems, particularly the flow of funds through the organizational levels to the program. This was an attempt to have the participants set their own priorities based on policies and plans evolving from natural coalitions of players. The project evaluation form was designed to force the players to confront each of the primary decision levels, one by one, for each project selected (see Figure 3).

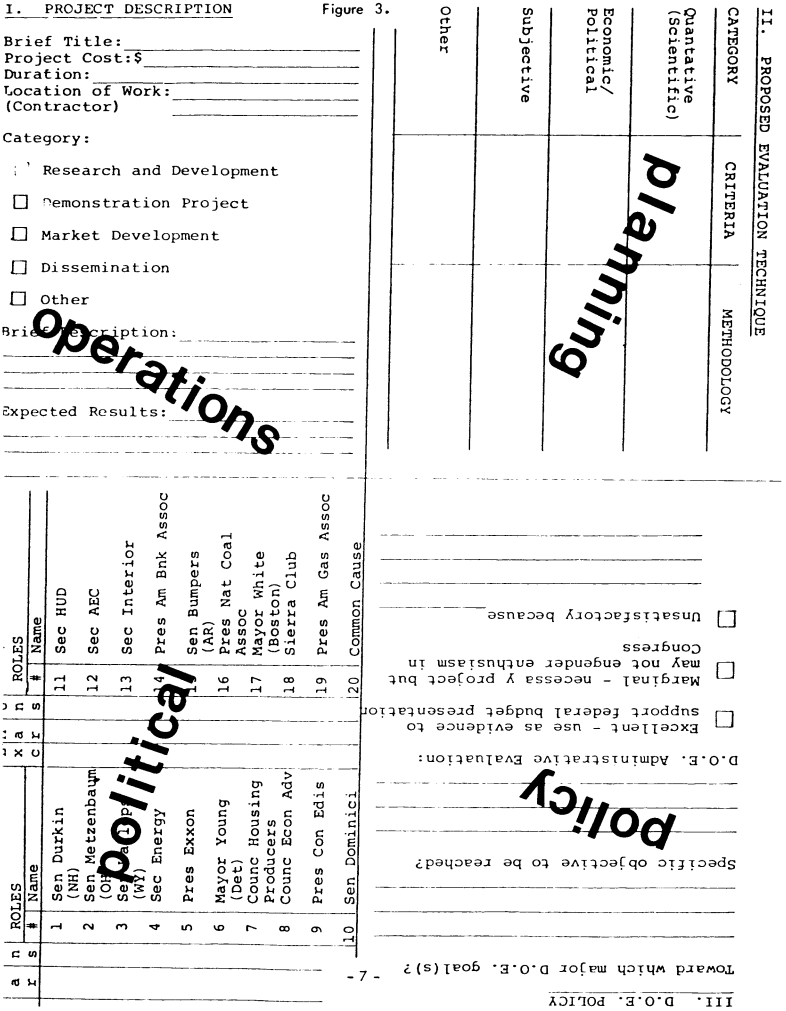

Figure 3

Step 1—Operations level described a project.

Step 2—Planning level proposed evaluation techniques.

Step 3—Policy level reviewed goals and objectives.

Step 4—Political level rated the utility of the project.

The results of this gaming process were the description of approximately 50 projects which produced about 150 criteria/methodology suggestions. In turn, these were discussed at length during the critique to produce a consensus toward an orderly system of evaluation. The proposed system of evaluation has five major components:

(1) It is specific to each project type.
(2) Generic criteria are used.
(3) Generic methods are employed.
(4) Summation of results is specific to decision level.
(5) Appropriate terminology is employed.

In practice, each project or project type would require a separate application of the principles involved. That is, a demonstration project might suggest different specific criteria, different specific methods, different terminology, and different reporting style than would a research project. There are several advantages to such a system, once it is completed. Its existence can serve to guide proposal writing as well as prior evaluation of proposals for funding. Project reports can be written to address the guidelines of the particular system that is appropriate to their project.

Evaluation can only fulfill a valid and useful purpose when it is done in a meaningful context. Cooperation can only be obtained, and fears allayed, if the participants at each administrative level understand the broader evaluative system into which their own actions fit. The strong tendency toward resisting evaluation flows not only from the extra work required but also from the fears generated by the process. If the evaluative process is perceived as meaningful and productive, logically linked through the four levels of decision-making (political, policy, planning, operations), then rewards to the participant will be self-evident. If the purpose of evaluation is accurately specified for each organizational level, with careful attention to distinguish between evaluation prior to action and

evaluation of actions now completed, anxieties will be minimized.

The gaming exercise has succeeded where many months of previous effort have failed; the participants were permitted to develop their own proposals, although always in the context of the larger problem.