A Competing Values Approach to the Study of Group Decision Support Systems

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ABSTRACT

Any organizational change has the potential to affect individual attitudes and behaviors. When the study of organizational change is directed by a more sociological scope of theory, however, the impact of change on individuals (assessed by inquiry of psychological focus) is treated in aggregate. The consequences of organizational change defined by shifting individual attitudes and behaviors come to be reflected in the apparent patterns of subsequent system performance. Parsons proposed that any system of action functions in four distinct ways: integration, goal attainment, adaptation, and tension management.

According to the competing values approach, most measures of system performance reflect one of four organizational models consistent with Parsonian theory: the internal process model, the rational goal model, the open systems model, and the human relations model. The competing values approach identifies both the dominant criteria for each model and the implicit organizational values they reflect. The study of the impact of group decision support systems (GDSS) can be undertaken as a exemplary case of organizational change produced by new technology. A competing values approach to such study provides a social-psychological paradigm for the future of GDSS evaluation and eventual GDSS redesign.

Introduction

A theory of any organizational change must be a theory of individual change in a social setting. The antecedents of change, the process of change itself, and the consequences of change are not only events that are defined by individual attitudes and behaviors, but they lead to subsequent alterations in individual attitudes and behaviors, as well. Nevertheless, a theory of organizational change cannot be merely a theory of individual change in a social setting. Its focus must be on the regularities of collective resistance and adaptation to environments that shift by design or by accident. Its result must be an explanation of the processes of social behavior that create and maintain relatively enduring structures of relationships within and between groups.

The social-psychological framework for organizational research suggested here is not novel. In fact, it borrows heavily from Homan's (1974) defense of "psychological reductionism" against the mainstream of sociological tradition that originated in Emile Durkheim's (1927) The Rules of Sociological Method. In Homan's view:

> ...though much emerges in social behavior, and is emerging all the time, which goes beyond anything we can observe in the behavior of isolated individuals, yet nothing emerges that cannot be explained by propositions about the individuals as individuals, together with the given condition that they happen to be interacting. The characteristics of social groups and societies are the resultants, no doubt the complicated resultants but still the resultants, of the interaction between individuals over time - and they are no more than that. (p. 12)

The individual or "micro" level for the investigation of organizational phenomena that Homans endorses renounces the possibility that the collective whole is more than the sum of its separate but interacting parts. Homans (1974, p. 357) was both concise and specific in his definition of an organization: "the persistent, concerted activities of a number of persons."

To argue that propositions about organizational changes must be based wholely in a social-psychological rendering of individual attitudes and interpersonal behaviors, however, is not necessarily to limit explanation to purely psychological concepts. In fact, there would be serious gaps in a conceptual framework with a solely personalistic view, a perspective that recognized only the uniqueness of each organizational actor. Missing would be variables that might account for mutualities of interest and accomplishment or for patterns of social interaction involving multiple constituencies. The need in organizational scholarship is, for example, for the study of communication rather than single conversations or for the study of productivity rather than personal achievement. Katz and Kahn (1978, p. 14)) addressed this problem when they noted,

> The weakness of the micro approach has been twofold. It has dealt with too few of the significant variables in the total situation. It has often seized upon inappropriate variables and has pushed too hard in the direction of showing the universality of some fundamental principles such as reinforcement in the learning theory approach to social problems. This reductionistic emphasis in its very character tends to lose the problem with which it should be concerned.

There would seem to be a serious incongruity between the scope of theory and the focus of inquiry required for the study of any organizational change. Although the social system or "macro" level must be taken as a conceptual starting point, the phenomena that are encountered, observed, and measured are clearly the attitudes and behaviors of individuals interacting in social settings. Is it possible to develop a social-psychological framework with concepts of primarily "sociological" scope supported by research of primarily "psychological" focus? The thesis that guides this paper is that this incongruity is

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not only possible but necessary; the social-psychological framework must be at a higher level of abstraction in its scope of theory but at a lower level in its focus of inquiry.

Both the statement of theory and the method of inquiry, though at varying levels of abstraction, reject alike a physico-geographic or social structural approach to the study of organizational change. The Hawthorne studies (Roethlisberger and Dickson, 1959) provided an excellent example of how the physical description of the work place, in particular, the level of illumination, was inadequate to predict or explain the performance outcomes observed. Only an approach that relies upon the subjective apprehension of the organizational environment by the actors involved is capable of giving meaning to the Hawthorne findings. The general position that the organizational environment is constituted by the individual was well expressed decades ago in W. I. Thomas' (1928, p. 572) concept of "definition of the situation" and his apothegm, "If men define situations as real, they are real in their consequences."

In sociology, it was the symbolic interactionists who emphasized in their theories that "man lives in a symbolic environment which mediates the relation of the physical environment to him" (Rose, 1962, p. x) and that the appropriate strategy for inquiry necessitates that "one would have to take the role of the actor and see the world from his standpoint" (Blumer, 1966. p. 542). A similar phenomenological approach to the characterization of the environment has long existed in psychology, as well. Lewin (1935) used the notion of "life space," Rogers (1951) the "phenomenal field," and Rotter (1954) the "meaningful environment." Appropriately focused inquiry about organizational change recognizes the significance of individuals' perceptions, accessible through subjective reports about themselves, their colleagues, and their decision-making setting.

Since the purpose of the social-psychological framework is to serve as a guide both for the development of a research design and for the interpretation of research findings, it is only practical to limit the framework to what Merton (1957) has characterized as "theory of the middle range," a network of concepts of modest scope oriented toward a well-delineated issue. Because the framework provides for neither grand nor overarching theory of organizational change, it should not be taken as the only useful way of construing the events and processes of concern. In fact, many variables of potential significance undoubtedly have been overlooked or ignored as the framework was developed. As a result, the framework reflects merely one of many possible theoretical constructions, and no amount of empirical support for this particular perspective can logically jeopardize the validity of other alternative approaches that might be taken.

The Competing Values Approach

Any organizational change has the potential to affect individual attitudes and behaviors. When the study of organization change is directed by a more sociological scope of theory, however, the impact of change on individuals (assessed by inquiry of psychological focus) is treated in aggregate. Parsons (1959) proposed that any system of action functions in four distinct ways: integration, goal attainment, adaptation, and tension management. The consequences of organizational change defined by shifting individual attitudes and behaviors come to be reflected in the apparent patterns of subsequent system performance. For example, a series of heated arguments between coworkers reflects a lessened capacity for tension management; increasing absenteeism begins to reduce the organization's ability to attain its production goals.

Quinn and Rohrbaugh (1983) empirically demonstrated that Parsonian theory could be used to explain researchers' judgments of similarity between the commonly used criteria of organizational performance. They concluded that most measures of functional effectiveness reflect one of four organizational models: the internal process model, the rational goal model, the open systems model, and the human relations model. More significantly, they identified both the dominant criteria for each model and the implicit organizational values they reflect. As shown in Figure 1, coordination/stability, planning/productivity, readiness/growth, and morale/human resource development are reflective of alternative organizational models. Rohrbaugh (1981) not only demonstrated how measures of individual attitudes and behaviors could be mapped to produce an overarching profile of organizational effectiveness but also illustrated how an organizational change such as the advent of new information technology could shift the performance profile of organizations over time (Rohrbaugh, 1985).

The competing values approach makes clear that several organizational tensions undergird Parsonian theory. Within each function (or within each organizational model), an emphasis on process or procedures (as means) competes with an emphasis on outcomes or objectives (as ends), for example, in the rational goal model with its dominant concern for goal attainment, too many resources directed toward planning can reduce organizational efficiency. Competing values also are apparent across models. To function well adaptively, organizational attention must be directed to external interests and differentiation or decentralization must be achieved. In stark contrast, the internal process model stresses clearly opposing values; integration is achieved by centralization and a focus on concerns within the organization. External versus internal focus and flexibility versus control are two additional dialectics of organization theory reflected in the competing values approach.

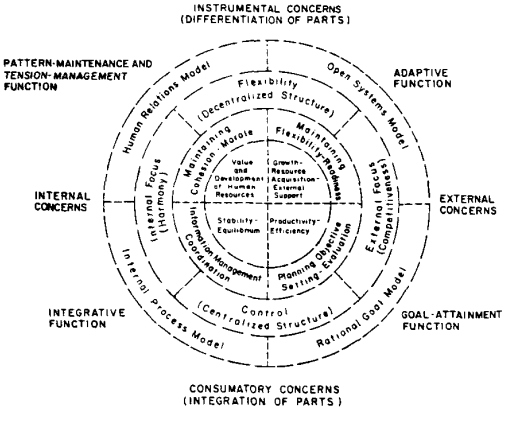

FIGURE 1
THE COMPETING VALUES FRAMEWORK

Stratification of Competing Values within Organizations

According to the competing values approach (Quinn & Rohrbaugh, 1983; Lewin & Minton, 1986; Quinn, 1988), four middle range models of organizational analysis exist: a) an internal process model that focuses on information management and coordination as the means by which stability and equilibrium can be developed as organizational outcomes of primary interest; b) a rational goal model that focuses on planning and objective setting as the means by which productivity and efficiency can be improved as organizational outcomes of primary interest; c) an open systems model that focuses on flexibility and readiness as the means by which resource acquisition and growth can be increased as organizational outcomes of primary interest; and d) a human relations model that focuses on cohesion and morale as the means by which the value of human resources can be made greater as an organizational outcome of primary interest.

In combination, the internal process and rational goal models reflect consumatory concerns, that is, the integration of organizational parts. In combination, the open systems and human relations models reflect instrumental concerns, that is, the differentiation of organizational parts. These two pairs are reflective of Gouldner's (1959) two general models of organizational analysis: the rational model with an emphasis on formal, planned behavior and the natural system model with an emphasis on flexible, spontaneous behavior.

The work of Jaques (1976, 1982) on stratified systems theory provides a useful basis for more thoroughly exploring the presence of competing values in organizational analysis. Jaques has proposed a common structure for all organizations, large or small, public or private, located in the East or the West, providing goods or services. This structure has eight strata or levels, with boundaries between strata representing qualitative shifts in the nature of work within each level. For job promotions within a stratum, the change in the position of decision makers merely means "more of the same," but promotions across boundaries result in quite different, more abstract, and far greater responsibilities. Jaques' basic structure of work in organizations is shown in Table 1. The strata about which Jaques has written can be understood better when juxtaposed with the competing values approach. The dominant values that receive expression in each stratum are linked directly to the four alternative models of organizational analysis described by Quinn and Rohrbaugh (1981, 1983).

Stratum I decision makers, while focused on the day-to-day demands of their work within the organization, must reconcile their own job satisfaction with the task specifications that explicitly direct their employment; their

TABLE 1
BASIC STRUCTURE OF WORK IN ORGANIZATIONS

Stratum	Organizational Level	Individual Position	Time Span	Main Activity	Task Characteristics
I	Shop floor	Clerical worker	1 day to 3 months	Concrete shaping	Following well established rules that are seen as inflexible; improvement occurs by gaining more practice and greater experience
II	Section	First-line supervisor	3 months to 1 year	Reflective articulation	Clarifying goals while working toward them; improvement occurs by reducing ambiguities with more workable definitions of the job
III	Unit	Department manager	1 year to 2 years	Linear extrapolation	Planning for work requirements by responding to predictable trends; improvement occurs by more accurate forecasting with existing technologies and more timely preparation
IV	Division	General manager	2 years to 5 years	Alternative subsystems	Identifying a variety of known approaches to the current work in search for better ways to enhance performance; improvement occurs by finding methods that increase efficiency
V	Subsidiary	Managing director	5 years to 10 years	Shaping whole systems	Redefining goals and objectives by creating plans and allocating resources; improvement occurs by increasing one system's responsiveness to opportunity and to threat
VI	Corporate group	Executive vice president	10 years to 20 years	Reflective articulation whole systems and the world	Creating long-term strategies for direction that can better guide relations between systems and their environments; improvement occurs when systems become less vulnerable
VII	Corporation	Chief executive officer	20 years to 50 years	Linear extrapolation whole systems	Anticipating the need for initiating, extending, or eliminating systems; improvement occurs as human resources are developed more effectively to redirect long-term initiative
VIII	Super corporation		50 years to 100 years	Alternative systems whole society	Conceiving of new social orders; improvement occurs as the quality of life in the society is enhanced

self-interest as employees spans the human relations and internal processes models. Stratum II decision makers, called upon to perform the integrative function for an organization, have the primary responsibility for basic coordination as first-line supervisors. For this reason, they are guided essentially by the values of the internal process model alone: maintaining control over the short-term, internal operations of the system.

Stratum III decision makers take on responsibility for anticipating and preparing for predictable events external to operations that may attenuate the unit's performance; their interests span the internal processes and rational goal models. Stratum IV decision makers are charged with the goal attainment function of the organization. As general management, these individuals most embody the values of the rational goal model alone: planning and implementing work programs that are expected to most improve the mid-term (2-5 year) profitability of their divisions.

The responsibility of stratum V decision makers for shaping are parallel to that in stratum I, although they must reconcile the competing values of flexibility and control at a more abstract level. In this stratum, the need for both flexibility and control results from external opportunities and threats, so that the whole system must be shaped: situations redefined, rules generated, and resources allocated. At stratum VI, decision makers become fully responsible for the adaptive function of the organization. Somewhat parallel to the reflective articulation of stratum II, the decision makers must develop 10 to 20-year strategies that assure the competitive advantage of their corporate group and that stress the importance of open systems' resource acquisition and growth.

Stratum VII decision makers are charged with providing an overarching vision for the long-range good of the whole system, as well as its environment. Extrapolations are made that parallel the work of stratum III, but here the forecasting is not analytical so much as synthetic and intuitive. Stratum VIII decision makers have ultimate responsibility for enchancing pattern maintenance and tension management functions of the larger society in which many systems operate. In

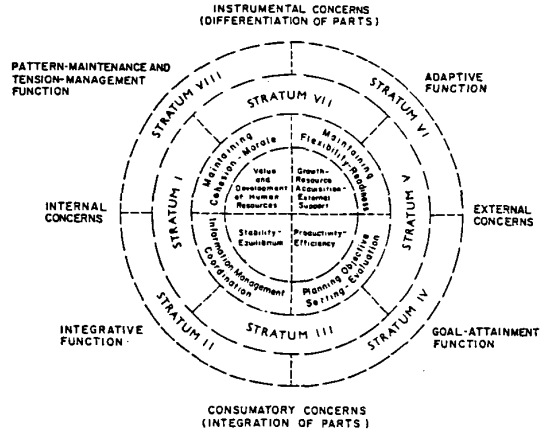

FIGURE 2
ORGANIZATIONAL STRATA AND COMPETING VALUES

searching for alternative systems, their work parallels the responsibilities in stratum IV, but, in contrast, they are guided by the values of the human relations model (cohesion and human resource development) where issues commonly come to the fore concerning an enhanced quality of life within future societies (i.e., pattern maintenance and tension management).

The juxtaposition of the competing values approach and stratified systems theory, summarized in Figure 2, offers a framework for reviewing historically the use of computers for improving decision making in organizations. The first use of computers for facilitating information storage and retrieval (stratum I) and information management (stratum II) is discussed in the following section.

The Use of Computers to Improve Internal Processes

The initial applications of computers to organizational problem solving (1955-1960) were in the financial area -- payroll, billing, accounting -- because these were the most formalized work subsystems and likely to be the easiest to program. Much stratum I clerical work became thoroughly automated, and some classes of clerical personnel (e.g., check-sorting and billing clerks) were reduced to a remnant. With the advent of transistors and magnetic cores (1960-1965), computers were designed to support batch processing methods, appearing in organizations wherever large quantities of information were to be processed in a routine manner. Quarterly and yearly stratum I work performance could be monitored for use by stratum II supervisors to better coordinate and control operations, not only in finance sections but increasingly in procurement, production, distribution, and marketing sections, as well.

Burck (1964, 143) serves as an instructive commentator on popular perceptions about computer trends of this period:

> Because the computer replaces manpower directly and enables other machines to replace more, it is perhaps the most powerful tool for raising human productivity ever invented, and automatically does away with many supervisor jobs. What may be more portentous, it is changing subordinate-management's tasks by eliminating many time-honored functions, such as those of bookkeepers.

In a mistaken leap of organizational strata, however, Burck (1964, 143-145) also suggested more wonderful contributions that computers were likely to make:

> ... the computer is steadily raising high management's power to make accurate decisions .... The unique achievement of the computer is that it is enabling the executive to clear away some of the uncertainty that surrounds him, to subtract some of the variables from the circumstances that fret him, to convert many ill-structured and inherently insoluble problems into well-structured and partly soluble ones, to rely less on hunches and intuition and more on analysis, to behave less as an artist and more as a scientist in disposing of routine matters.... It organizes and processes information so swiftly that computerized information systems enable top management to know everything important that happens as soon as it happens in the largest and most dispersed organizations.

Such enthusiasm for "total systems" that would supply all of the information needs of top management was fueled even more as airline reservation and stock quotation systems offered demonstrations of the developing capacity for on-line inquiry using primitive versions of communication controllers and random access file storage devices. With advances in integrated circuits and new types of remote terminals (1965-1970), geographically dispersed users were offered the opportunity to communicate with centrally located computers. Nevertheless, Burck (1964) was doubly mistaken: that the type of information required for work above stratum IV could be provided through the use of computer-based information systems and that the type of information actually contained in such systems would be able to solve directly the problems confronting strata III and IV decision makers, the individuals who actually are engaged in "disposing of routine matters."

The Use of Computers to Achieve Rational Goals

During this period of increasing commitment to information gathering as a remedy for all organizational problems, Ackoff (1967, B148), instead, challenged the "ideal which has emerged from this orientation," that is, "an infinite pool of data into which a manager can reach to pull out any information he wants." Ackoff (1967, B150) argued that, although decision making might seem easier with access to more information, managers often were already swamped with it, used only a small portion of what was available, or may not use the right portion in optimal ways:

> It is frequently assumed that if a manager is provided with information he needs, he will have no problem in using it effectively. The history of OR stands to contrary. For example, give most managers an initial tableau of a typical "real" mathematical programming, sequencing, or network problem and see how close they come to an optimal solution. If their experience and judgment have any value they may not do badly, but they will seldom do well. In most management problems there are too many possibilities to expect experience, judgment, or intuition to provide good guesses, even with perfect information.

The problem with such apparent "bounded" rationality in managerial decision making was that increasing the size of an already large data base offered little hope for improvement. The need for computer support of decisions made by department managers and general managers (strata III and IV) increasingly became viewed as dependent at least as much on the provision of models to structure the problems of linear extrapolation and the evaluation of alternative subsystems as on ready access to computer-based information systems. The period from 1970-1975 witnessed the advent of decision support systems (DSS) that moved the use of computers for improving decision making up into the work of strata III and IV for the first time. McCosh and Scott Morton (1978, 3-4) in reviewing these developments described:

> ... an area we call decision support systems (DSS), that is, supporting the decision process of managers with flexible access to models and relevant information.... This decision support systems area is different from the so-called management information systems (MIS) field. This latter field, despite tremendous growth in computer related activities, has had little significant impact on management.... We now can build entirely new kinds of systems that dynamically involve the manager's judgment and support him with analysis, models, and flexible access to relevant information.

DSS quickly found their appropriate niche within these next two strata of organizational work. As Keen and Scott Morton (1978, 11-12) acknowledged:

> Where a decision process is fully structured, automation is feasible (at a price) and the traditional techniques of EDP and OR/MIS are practicable. Where it is unstructured, from the perspective of either the decision maker or the main body of theory relevant to understanding the task, the DSS philosophy argues that computer tools are inapplicable.... Decision Support Systems focus on semistructured tasks.

Alter's (1980) survey of 56 typical applications of DSS that were in use during the 1975-1980 period found approximately two-thirds to be truly "model-oriented" systems that might well compensate for the "bounded" rationality of strata III and IV decision makers facing routine but complex choices. These systems, for example, included calculating charter rates charged for particular ships, preparing expense budgets for production plants, minimizing idle cash in bank accounts, examining profit impact of alternative inventory levels, producing detailed equipment need analysis, determining the start date of training classes, and assuring insurance rate calculations were consistent and accurate.

Enthusiasm for the use of DSS has been great. As a result, it is not surprising that strong encouragement has been given for their application "at all managerial levels of the organization," even for "managers faced with those ill-structured problems that are typical of strategic decision making" (Hogue & Watson, 1985, 205-206). But can DSS assist with the tasks that comprise the managerial work in strata V and VI? Evidence is mounting that computer support for decision making at the next levels of the organization require quite different design, as the early developers of DSS astutely recognized.

The Use of Computers to Encourage Open Systems

The work of shaping and reflective articulation of whole systems that characterizes the responsibilities of strata V and VI is clearly on the other side of the boundary from the improvements in strata III and IV decision making fostered by DSS in the 1975-1980 period. At these higher organizational levels, problems are ill-defined in the sense that at the outset there is considerable uncertainty about what issues are involved and how to represent them. Decision making in such situations commonly involves unique rather than routine processes, and the information typically is not available that would support fully the selection of a preferred course of action. A hallmark of work in strata V and VI is "procedural uncertainty" (Hogarth, Michaud, & Mery, 1980), that is, uncertainty concerning the means to process the decision: knowing how to specify relevant task uncertainties, what information to seek and from whom, how to invent alternatives or to assess consequences. Procedural uncertainty describes the difficulty confronted in deciding how to decide.

Humphreys (1984, 6) has identified one important reason why none of the developments of the previous decade in the models underlying DSS (e.g., influence diagrams, probabilistic information processing systems,

multiattribute utility theory) could improve marginally decision making in strata V and VI:

> None of these developments in decision theory addressed the problem of procedural uncertainty. The procedure to be used by the decision maker and the structure within which his problem would be represented were assumed to be prespecified. Initial attempts to build decision aids also followed this assumption, concentrating on "automating the composition rule" within some prespecified structure which was assumed to have the characteristics that the decision maker needs to control his decision. The underlying idea was that of the decision maker needing assistance in investigating his own assessments within a defined structure. However, this assumption was generally not relevant to decision makers facing unique problems in less well-defined situations.

The lack of one-to-one correspondence between problem type and the appropriate solution principle for novel decisions required a different use of computers for the work of shaping and reflective articulation of whole systems. It has been the 1980-1985 period that has witnessed the sudden proliferation of the microcomputer and "user-friendly" software throughout organizations and, with their coming, the development of group decision support systems (Huber, 1984b) or automated decision conferencing (Quinn, Rohrbaugh, and McGrath, 1985). For example, Phillips (1984, 96) has described the approach he has taken with decision conferencing to support resource allocation and strategic planning for strata V and VI decision makers in Great Britain and Europe:

> The initial couple of hours on the first day of a decision conference is spent in a free discussion of the problem, the issues of concern, and the main objectives.... While this model is being created by the group, it is implemented on the computer system. The specialist helps the group to ... develop a structure for the problem, to assess judgemental quantities and to interpret the results from the computer. On the second day the results of manipulating the computer models are compared to the participants' intuitions. When discrepancies occur, as they inevitably will, the model may be revised or intuitions changed and the process repeated.... Experience with decision conferences for top executives has shown that one of the main benefits is that the group develops a shared understanding of the problem and ... an agreed plan of action.

Will the computer modeling that occurs in the context of decision conferences, particularly the resource allocation models most common and useful for structuring the problems of adaptation endemic to strata V and VI (Milter, 1986), also be appropriate across the next boundary of organizational work? Although proponents of group decision support suggest its general applicability for the problems of "senior executives" and "top management" (see, for example, Phillips, 1985), there may be reasons to suggest still different uses of computers will be required for improving decision making at the highest organizational levels. The 1985-1990 period is witnessing the exploration of newly designed group decision support consistent with the nature of work at the very top of the largest corporations.

The Use of Computers to Enhance Human Relations

The flexibility in structuring a unique problem provided through the microcomputer to decision makers in strata V and VI may be designed to grapple with procedural uncertainty, but the models employed in decision conferencing still maintain the form of those found at lower organizational levels: decision trees, multiattribute utility models, and cost-benefit algorithms. Crossing the boundary to the work of linear extrapolation and evaluation of whole systems (strata VII and VIII) makes such models obsolete. Vari and Vecsenyi (1983), for example, have reported how decision makers at the very highest organizational levels are unwilling to accept that they have no agency whatever over the states of nature (i.e., the chance forks) in a decision tree, events the probabilities of which the decision analysis model implies can only be assessed but not controlled. Similarly, the assessment of utility and cost have no analytical use when their values no longer are fixed quantities to be estimated but rather are viewed as entirely tractable over a time span of 20 to 100 years. In fact, information in the usual sense has little extrinsic worth for supracorporate decision making, since the types of uncertainty that plague decisions at lower organizational levels carry hardly any meaning here.

There are indications that the use of computers for any future improvement in decision making within strata VII and VIII may incorporate a class of certainty-geared models that serve to clarify thinking about the dynamic interdependencies of complex systems. Such models might include maps of cognitive systems (see, for example, Axelrod, 1976; Eden, Jones, & Sims, 1983) or socioeconomic systems (see, for example, Forrester, 1969, 1971). Cognitive maps and system dynamic models not only are similar in that the causal relationships between variables typically are "hard-wired" (rather than probabilistic) but also because they typically are "information-free," that is, built primarily on impression, belief, judgment, wisdom, and intuition.

Lessons from the Past--A Framework for Future Research

The past 30 years have witnessed dramatic changes in the use of computers for improving decision making in organizations. During these decades, however, at least three mistaken assumptions about organizational decision making continuously have plagued management science, information science, and computer science:

1. the levels of work in organizations are quite homogeneous;
2. the requirements for decision support across boundaries are quite similar; and
3. the technologies for improving decision making are quite all-purpose.

The failures to distinguish carefully the characteristics of responsibility at each organizational level, to recognize wisely the unique needs for assistance each level presents, and to speak cautiously about the generality of specific technological changes have been noted above. However, the competing values approach, when juxtaposed with the particular work requirements to be found within each stratum of organizational responsibility, offers simultaneously a more differentiated and more integrated representation of the context in which computers will be used to improve organizational decision making. How can one assess the effectiveness of the match between computer "interventions" of one sort or another and the decision-making processes that they are intended to support? How can one establish the suitability of decision support technologies for the various levels of work in

organizations? The competing values approach offers a conceptual framework well-suited to guide research on these questions, since it suggests multiple criteria useful for the purposes of diagnosis, design, and evaluation.

Of course, the primary concern at lower organizational levels is to manage information and insure accountability through better documentation and record keeping. Certainly by stratum IV, the primary concern has shifted to maximizing efficiency through careful targeting of organizational objectives. However, should evaluative criteria for decision support technologies be limited to such issues as reliability, accuracy, speed, cost savings, or capacity? The conceptual framework of the competing values approach suggests that other criteria may be very important, as well, particularly at higher organizational levels. At stratum VI, for example, the primary concern is to acquire greater external support and legitimation through constant adaptation and readiness for change. Furthermore, at the highest strata the need to develop leadership resources requires adherence to the kind of flexible and participatory decision-making processes that are known to build increased understanding of, confidence in, and commitment to the long-term future of the organization.

Competing Values for Diagnosis, Design, and Evaluation

The conceptual framework of the competing values approach has been applied not only to the study of organizational performance but in parallel to group decision making and to individual leadership, as well, demonstrating that the same value dimensions (i.e., means versus ends, external versus internal, flexibility versus control) undergird all three levels of analysis. Since a theory of organizational change must be a theory of individual change in a social setting, the competing values approach has been found to be equally applicable at the individual, group, and organizational levels. In this manner, the antecedents of change, the process of change itself, and the consequences of changes (as diagnosis, design, and evaluation) can be investigated within a single, coherent social-psychological paradigm.

As diagnostic inventory, the competing values approach points to eight facets of effective (or ineffective) performance of organizations, groups, or individual leaders. As a design tool, the competing values approach encourages innovators to consider eight areas in which possible change may produce intended (or unintended) consequences to organizations, groups, or individual leaders. As an evaluation instrument, the competing values approach provides eight criteria by which the positive (or negative) impact of change can be assessed for organizations, groups, and individual leaders. It is important to note that, although the conceptual framework is more sociological in scope of theory, it is more psychological of focus of inquiry, since all measurement builds upon individual perceptions of performance: of the organization, of the group, and of the leader.

Diagnosis, design, and evaluation at the organizational level of analysis. The earliest work on an instrument based on the competing values approach was focused on the assessment of organizational effectiveness. Rohrbaugh (1981, 1983) validated an eight-factor instrument that was used to measure the effects of a billion dollar, five-year initiative by the U.S. Department of Labor introducing office automation in local Job Service offices across the country. Profiles of organizational performance on the eight effectiveness criteria were constructed prior to (diagnosis) and following (evaluation) full office transition from paper to automated files. An illustrative performance profile for one Job Service office is shown in Figure 3; the profile reflects the perceptions of office effectiveness among clerical workers at stratum I. Figure 3 indicates that, relative to other Job Service office secretaries participating in the study, these employees reported strong organizational performance in human relations but weak organizational performance in rational goals. Because of the values of primary importance at stratum I, these clerical workers were generally satisfied with the overall pattern of office performance.

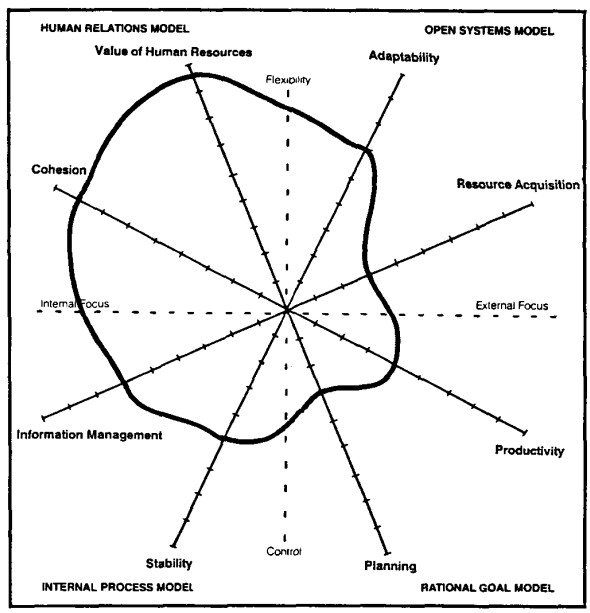

FIGURE 3
A COMPETING VALUES APPROACH
TO ORGANIZATION PERFORMANCE

Diagnosis, design, and evaluation at the group level of analysis. More recent studies have shown that the perceived effectiveness of group decision-making processes can be measured using the competing values approach, that is, the extent to which the integrative, goal attainment, adaptive, pattern maintenance and tension management functions of a group are achieved (Milter, 1986; Rohrbaugh, 1987; McCartt & Rohrbaugh, in press). In one recent application, strata IV and V managers in one organization completed a questionnaire with which they described a typical decision-making process in which they had been engaged as an executive team. Then, several weeks after using decision conferencing as a group decision support technology (Milter & Rohrbaugh, 1985, in press; Quinn, Rohrbaugh, & McGrath, 1985;), they completed a second questionnaire with which they described the GDSS intervention. The initial diagnostic portion of the findings, represented graphically in Figure 4, indicated that the group believed itself to be performing well in rational goals and open systems; the subsequent evaluation of the decision conference by the group indicated perceptions of significant improvement in participation, supportability, and accountability.

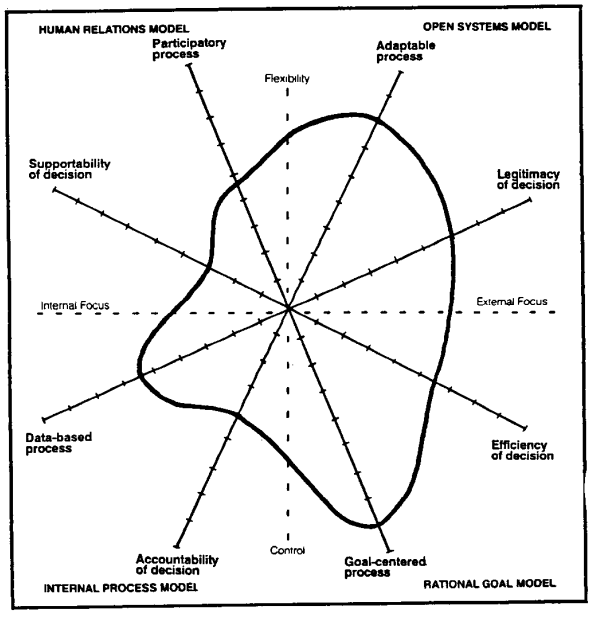

FIGURE 4
A COMPETING VALUES APPROACH
TO GROUP DECISION MAKING

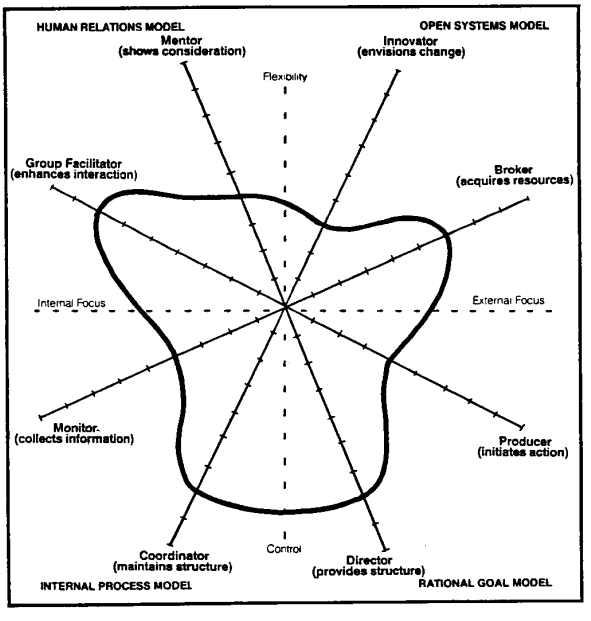

FIGURE 5
A COMPETING VALUES APPROACH
TO LEADERSHIP EFFECTIVENESS

Diagnosis, design, and evaluation at the individual level of analysis. Quinn (1988) has written extensively on the application of the competing values approach to leadership theory. Quinn not only has identified eight leadership roles, but he also has developed a measurement instrument that can be used to assess the extent to which individuals are viewed as effectively performing the roles of monitor, coordinator, director, producer, broker, innovator, group facilitator, and mentor. The profile of effective leadership undoubtedly shifts across organizational strata. The profile presented in Figure 5 might be acceptable at stratum III, though enhanced skills in the role of producer would be required for eventual promotion. Such a profile helps to indicate how job training might be better designed for such a manager.

Study of a variety of organizational changes (particularly technological change) across a variety of organizational strata should help to increase our understanding of the relationships between the levels of work in organizations, the requirements for decision support across such boundaries, and the strengths and limitations of technologies for improving decision making. Perhaps a concerted effort to identify more precisely the strata of organizational work and the distinctive decision support needs of each will lead to more effective efforts at innovation. The use of a competing values approach to guide such organizational research should provide more inclusive criteria for empirical efforts of diagnosis, design, and evaluation, particularly in the GDSS field.

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