

Ralph H. Kilmann
and Bill McKelvey

The MAPS Route to Better Organization Design

All of the popular approaches to Organization Development (OD) concentrate on improving existing subsystems—teams, work groups, project groups, departments, divisions—without raising the possibility that the existing structural design or division of labor may be ineffective. They assume that the existing design is best for achieving the organization's goals!¹ But suppose that these subsystems are based on erroneous and outdated notions on how the organization ought to be designed, and that the subsystems simply do not represent a useful segregation of organizational activity? We think that spending time, money, and efforts on improving subsystems just possibly composed of the wrong people working on the wrong tasks is a misguided approach.

We wish to describe a theory and method that helps managers and their subordinates to locate everybody in the correct, possibly new subsystem *before* such OD approaches as team building, process consultation, grid organization development or interpersonal peacemaking are implemented.² The method emphasizes *multivariate analysis, participation, and structure*, which we abbreviate as MAPS. As will be seen, MAPS is consistent with the goals, values, and process methods of OD. Our method also enables the complex issues of organization design to be dealt with in a quick efficient manner via

multivariate analytical techniques and modern-day computers. Furthermore, the periodic use of MAPS helps managers determine how well the present organization design is adapted to the demands of the environment independent of, or even following, already concluded OD interventions.

Designing Purposeful Subsystems

One of the most important series of empirical investigations on organization design is that by Lawrence and Lorsch and others: the *contingency theory* approach.³ Comparing firms in different industries, they show that organization subsystems are differentiated along more lines than just product or functional specialization. They found differentiations among subsystems with regard to behavioral attributes such as leadership style, personality type, and various cognitive, emotional, and structural orientations. But the more organization subsystems develop unique characteristics to deal with their specific task environments, the more difficult it is to integrate these divisions into an optimally functioning whole. Differentiation leads to high performance only when accompanied by appropriate well-working integrative mechanisms. Based on this research, effective managers *first* differentiate the subsystems to adapt them to the

relevant task environment and *then* develop the necessary integrative mechanisms.

Lawrence and Lorsch define differentiation as a *state* (a particular segmentation of the organization into subsystems) and integration as a *process* (a continuous effort to achieve unity of activity among diverse subsystems). However, we prefer to treat them both as processes. This is consistent with modern organization and management theories suggesting that organizations be prepared and know how to alter their internal structures and processes in order to stay in fine tune with a dynamic environment.⁴ We suggest that organizational structure is not a permanent state. Instead, *structural design (design management) is a recurring event*, an important process for the organization to manage along with the traditional processes of problem-solving, decision-making, communication, leadership, and so forth.

To many students of organization, one of the problems associated with the implementation of a particular structural design is that it is typically imposed on lower members of the organization by those at the top of the hierarchy. This seems to occur for several reasons:

- Members of the subsystems simply are not seen as able to decide for themselves how they should be differentiated and what integrative mechanisms are necessary. This could be because management believes that the lower members cannot make decisions or lack the proper perspective.
- Methods are not available that allow the many lower members of the organization to successfully and efficiently participate in the decision.

It seems easier for one top manager to work with a consultant in proposing a new design.

Ralph W. Kilmann is Assistant Professor of Business Administration at the Graduate School of Business, University of Pittsburgh. His current research and consulting focus on the design and development of complex organizational systems.

Bill McKelvey is Associate Professor of Human Systems Development at the Graduate School of Management, University of California, Los Angeles. His current research interests are organization design, management of scientists and engineers, and philosophies of organization science.

- Managers are unwilling to give up their prerogative to make the design decisions themselves.

The consequence of top-down design management, however, is that the structural design may be out of tune with the realities of the lower members, may not be supported by them, or, even worse, may be sabotaged by them. If top management has imposed a design and if the organization's environment is uncertain, it is quite likely that the initial design may become quite inappropriate to the changing conditions in the environment. Even more likely, the lower members may withhold their information about this problem from their superiors.

We see no theoretical reason in the differentiation ideas suggested by the contingency theorists requiring them to locate the design decision above or outside the subsystems involved. Unfortunately, the contingency theorists do not pay direct attention to where these decisions are best made, other than to imply obliquely that the decisions are made by top management.⁵ Whether this decision location is the result of chance, assumption or good reason is not clear because they never discuss the locus issue.

Purposefulness. We and others⁶ now define an organization as a purposeful system containing one or more purposeful subsystems. Purposefulness is defined as the ability to exercise conscious choice among alternatives—in this case, alternative purposes and alternative structural designs enabling the achievement of purpose.⁷ The principal advantage of using purposefulness as a design objective is that it puts first priority on creating conditions fostering subsystem decision-making or exercise of will. It puts foremost emphasis on subsystem responsiveness and action taking. Since the subsystem can be as elaborate as it wishes in its own differentiation, this approach loses none of the positive advances made by Lawrence and Lorsch and other contingency theorists. By placing purposefulness or decision-making at the place where differentiation is required, on the battle line so to speak, the subsystems are better able to stay in fine tune with a dynamic environment. Differentiation can be redesigned recurrently as warranted.

As with contingency theory, we see the development of integrative mechanisms as a subsequent

step, one which cannot start until the differentiation step is completed. A principal advantage of purposeful subsystems is that they can decide what integrative mechanisms are necessary, and can then establish them. As long as a subsystem is purposeful and its purpose is compatible with that of the organization, it has the ability and can be encouraged to develop its own integrative mechanisms. In other words, since each subsystem cannot act completely independent of the others, the interdependencies must be managed either by the subsystems themselves (if they are purposeful) or by top management.

Participation. In attempting to design purposeful subsystems, it is desirable, if not essential, that all members participate in the design process. One of the benefits of the participative approach is that individuals are more likely to implement and be satisfied with decisions they have had an opportunity to influence.⁸ Such participation would help assure member cooperation and commitment to work toward achieving subsystem purposefulness. Basically, there are two ways in which the lower members of an organization may participate and thereby have direct influence and more trust in the organization design decision: by having control over the information upon which the decision is based; and by assuring themselves that the actual decision and the design analysis are not in the hands of a minority vested interest group such as top management.

Subsystem purposefulness requires group decision-making by consensus—a group process requiring congruent attitudes, values, and skills.⁹ This requirement makes individual members the only relevant information source about other members with whom they have such congruency. This broad information base is especially appropriate when the individuals are sensitive to environmental forces, know how their function or task activities are best pursued, and know which colleagues would help their purposefulness most.

Recent experiences with autonomous work groups suggest that most individuals can provide such relevant and accurate information under conducive organizational conditions.¹⁰

Fostering Purposefulness

It has become evident to researchers and managers that existing structural designs can be made to work better if some sort of Organization Development (OD) approach is made available to the members in the organization. However, while we can argue that a poor structure can stand in the way of an OD program, a well-designed structure is a necessary, but usually not a sufficient, condition of effectiveness. Thus, various OD “treatments” are needed to help a particular design and the people and subsystems it comprises reach its full potential, realizing that the quality of the design poses an upper limit on just how effective the organization can be. Specifically, OD efforts are needed to help each subsystem decide upon and become committed to a purpose, as well as to marshal its problem-solving, communication, and leadership abilities to best accomplish this purpose. In addition, OD can help the subsystems develop necessary integrative mechanisms so that the interdependence of the various subsystems can be effectively coordinated. Ideally, OD can further the integration of subsystem purposefulness into overall organizational purposefulness thereby allowing the organization to effectively adapt to its environment, while at the same time providing a climate that is congruent with membership needs for self-expression and meaningful work.

We see modern OD approaches as generally furthering subsystem purposefulness. As W. G. Bennis says: “The basic value underlying all organization-development theory and practice is that of *choice* . . . organization development is: an educational strategy employing the widest possible means of experience-based behavior in order to achieve more and better choices in a highly turbulent world.”¹¹ R. L. Lippitt defines organization renewal as the “process of initiating, creating, and confronting needed changes so as to make it possible for organizations to become or remain viable, to adapt to new conditions, to solve problems, to learn from experience, and to move toward greater organizational maturity.”¹² The theme of conscious choice threads its way through both of these definitions. The ability to exercise conscious choice is central to our definition of purpose-

fulness, emphasizing that the design of organizational subsystems is a fundamental arena for the expression of member choices.

In this article, where our concern is with better organization design, it is critical that the organization design criteria be compatible with the values and practices of the OD activities to be used to develop the organization's subsystems. Given that top management has decided to invest the considerable time and expense the typical OD program involves, they should assure themselves that the existing organization design (and the design assumptions or criteria upon which it is founded) will not undermine or unnecessarily slow down the OD effort by inadvertently having the wrong people or the wrong set of task interdependencies in the subsystems to be developed. The design theory we outlined in the prior sections is compatible with the values and objectives of OD. We also propose a *technology* in the MAPS method that facilitates organization design in a manner that is also complementary to OD values and objectives.

The MAPS Method

We suggested earlier that a major reason why design decisions are imposed from on high is that methods have not been available that allow the many lower members of the organization to successfully and efficiently participate in the decision. If and when top management agrees to let lower members participate, a means of easily collecting and analyzing information from all relevant organizational members is necessary. The most feasible mode of collection is the structured questionnaire method often applied to measure all types of individual beliefs, attitudes, and values. Alternatively, open-ended questionnaires or interviews could be used to collect the desired information, but at greater cost. It is crucial, however, that the information collected be valid and reliable and that all the information collected be processed quickly in a form that members can use to design the organization.

The use of multivariate analytical methods is one way of assuring an efficient analysis. Briefly, multivariate analyses, such as factor analysis, cluster analysis, and multidimensional scaling, are procedures that reduce the apparent complex-

ity of large data matrices composed of many items of data from many sources. They are based on the idea that there is much overlap and redundancy in this data. These methods reduce the many items of data the decision-maker faces by pooling the items into a few independent clusters of similar items. Thus, instead of having to consider 100 items of information, the manager using multivariate analysis may only have to face ten pooled or summary items. These methods have reached a point in their development where the analysis can be straightforward, objective, and replicable by others so long as the specific techniques used are made known. Much of this objectivity is due to computers.

To be consistent with the notion of purposeful systems, we recommend that organizational members or their representatives be involved in the design of the MAPS questionnaire because their inputs (information, perspectives, interests, task abilities, and so on) are likely the most relevant concerning the possibilities for attaining organizational objectives; and their commitment to any new design is essential in order for that design to be successfully implemented in the organization.

The MAPS questionnaire will generally include two types of items: those assessing member perceptions of other members' potential as helpful colleagues (colleague variables); and those assessing member perceptions about their priorities concerning various organizational task activities (task variables). The first type will usually be measured sociometrically, that is, individuals will indicate with whom they can best interact. When members do not know each other very well (as, for instance, when they have been working in different departments), personality measures may be more desirable. Organizational activity priorities can be assessed by generating questionnaire items that represent the variety of task activities required for goal attainment. (The process of developing the task variables on the MAPS questionnaire will be illustrated in the next section.) We believe that each kind of variable should be equally represented in the questionnaire because both task and interpersonal compatibility are necessary for purposefulness and organizational effectiveness.

While a variety of multivariate methods exist, we have found it useful to apply factor analytic techniques.¹³ The basis of the MAPS factor analysis involves separating the respondents of the MAPS questionnaire into subsystems according to their similarity in endorsing task variables (on a seven-point Likert scale) and similarity in indicating who of their colleagues they can best interact with in the pursuit of organizational tasks (also on a seven-point Likert scale). Respondents are therefore placed in the same subsystem if they have congruent skills, attitudes, values, interpersonal styles, and shared commitment toward the tasks to be addressed. A subsystem that has this congruency is more likely to marshal its problem-solving abilities and resources, and if at the same time the subsystem has some consensus as to what specific tasks the members would like to apply their skills, then it is expected that the subsystem will be able to efficiently and effectively strive toward its objectives. Furthermore, the MAPS factor analysis creates fairly independent groupings of respondents (subsystems). In this way, each subsystem can then pursue its objectives somewhat independently of the others, although some integrative mechanisms would surely be necessary to coordinate the several subsystems into a functioning whole.

Illustrations of MAPS

While at this time we have not combined MAPS with an extended OD program, we have applied it to a major U.S. industrial organization and an educational institution. In the first case, we will illustrate how the MAPS questionnaire was developed by five levels of management across three traditional subsystems. This example will demonstrate the important process of members generating the information needed to re-design the organization. In the second case, we present the results of a longitudinal study where the best design solution of MAPS was compared to the "natural" evolution of a new organization design, twenty months after the MAPS analysis was performed. This example demonstrates the validity of the MAPS method for guiding and predicting the design of purposeful subsystems.

*Developing the MAPS Questionnaire.*¹⁴ The vice-president of a division of a major U.S.

industrial organization became interested in the MAPS method for two reasons. First, his division had been experiencing many interface conflicts among the sales, marketing, and engineering functions in that all three functions were attempting to perform the same tasks in several areas. Second, considerable time and effort had been spent on province statements and job descriptions to define and pinpoint the basic authority base and activities to be pursued by these functions. However, these and other efforts to improve the effectiveness of the division by working within the pre-existing design of divisional subsystems had, in the words of the vice-president, "failed miserably." It was becoming more and more apparent that the basic design of these subsystems required a systematic investigation.

Once the vice-president became committed to the MAPS method, he met with his department heads to discuss the method and the general idea of re-designing the division. The group decided that they would like to see a re-design occur based on information from the people who performed daily the projects and tasks. With the aid of our counseling, the group also decided that the MAPS method could be applied in two steps. First, all five levels of managers across the three functions would be included in the MAPS assessment to determine the re-design of global divisional functions. Second, at a later time, the MAPS method could be applied to further specify the design of each of the global functions that were derived in the first analysis. The first step would include a total of sixty managers while the second step would require several MAPS analyses involving several hundred engineers and technicians.

The following seven major activities briefly describe the development of the MAPS questionnaire for the first step of the design process, the derivation of global divisional subsystems.

First, the vice-president and his department heads outlined five "basic business objectives" around which they believed all divisional tasks should be designed. These were: (1) proposing and selling the systems job, (2) scope clarification of the systems job, (3) closing the systems job, (4) standardization and obsolescence, and (5) product planning.

Second, a meeting was held for all sixty divisional managers where the purpose and procedure of the MAPS method were discussed and illustrated. There appeared to be a general consensus that the method would provide a useful approach to their interface problems and, in fact, the managers were both surprised and delighted with the idea of their providing the inputs to re-design the division. The main concern was the personal nature of the colleague portion of the MAPS questionnaire where each individual indicates how much he would like to work with each other individual. To alleviate any anxiety, it was agreed that we would be the only ones to see the completed MAPS questionnaire—that the respondents would return their questionnaires directly to us.

Third, at the end of the meeting, it was explained how each manager was to generate several task activities for each of the five basic business objectives, according to what he is currently doing or feels he should be doing to accomplish these objectives. During the next week, the managers generated approximately 1200 task items within the framework outlined by top management.

Fourth, the head of industrial relations, his staff, and a representative group of managers from the three functional areas met to carefully process all the task items: (1) to eliminate the considerable amount of redundancy, (2) to eliminate departmental jargon so that each manager could comprehend all task items, and (3) to edit the task items so that each was stated in clear, concise phrases. The final list resulted in sixty-four task variables.

Fifth, the task variables were then randomized and prepared for the MAPS questionnaire. Exhibit I illustrates a sample of task variables that appeared as Section 1.

Sixth, the names of all sixty managers were alphabetically listed for Section 2 of the MAPS questionnaire. Exhibit II illustrates the general format of this section.

And seventh, all sixty managers responded to both sections of the MAPS questionnaire and sent the completed forms to us. Their responses to the questionnaire were then keypunched onto

computer cards and then processed by the MAPS factor analysis program.

The Design of Research-oriented Subsystems. The management department of a large university was looking for a new organization design for two reasons: as a result of steady changes in the research thrust of many faculty members, there was as much interaction across subsystem boundaries as there was within boundaries (for example, several faculty members were involved in more than one subsystem); and many of the skills and orientations of the younger faculty did not fit the existing structural design.

The task variables that appeared on the MAPS questionnaire were thirty-one research orientations or "study center concepts" that had been described by various faculty members. For the colleague variables, all 115 faculty members' names were listed. The format of the MAPS questionnaire that was used in this study was similar to that shown in Exhibits I and II.

The MAPS results were announced to the faculty in a memorandum from the dean which presented the two most different structural designs: one solution decomposed the faculty into *five* subsystems, while the other solution designed the faculty into *eleven* subsystems. (It should be noted that factor analytic techniques permit a number of different solutions.) The dean also described the highlights of the analysis and the appropriate action steps to take next. In essence, the faculty members were allowed an open-ended length of time during which each individual could decide to stay in the subsystem designated by MAPS, to become a member of some other subsystem, or to combine or modify either the five- or eleven-subsystem solution by forming a different number of subsystems. Since the faculty were encouraged to deviate from the MAPS result if they felt it had designated the wrong number of subsystems or had placed them in the wrong subsystem, we had an ideal situation to compare the MAPS solution with the eventual organically evolved decisions of each faculty member.

Twenty months after the dean's memorandum presented the two MAPS solutions, we compared the organically evolved actual subsystems (study centers) with the MAPS solution indicating a

Exhibit I. An Illustration of Section 1 from the MAPS Questionnaire

Please indicate how much you would be interested in participating in either all or a portion of each of the following organizational tasks:

	Not at all.	Much below average.	Below average.	Average.	Above average.	Much above average.	Of prime interest.
Acquaint or sell customer on proposed system job	___	___	___	___	___	___	___
Furnish technical support in meetings with customer	___	___	___	___	___	___	___
Attempt to influence customer specifications	___	___	___	___	___	___	___
Participate in specification review with customer	___	___	___	___	___	___	___
Prepare detailed system description	___	___	___	___	___	___	___
Determine if all customer obligations have been met	___	___	___	___	___	___	___
Recommend design changes to simplify, reduce cost, and standardize	___	___	___	___	___	___	___
Coordinate new assemblies to utilize standard parts	___	___	___	___	___	___	___
Identify new product opportunities	___	___	___	___	___	___	___
Develop new product sales promotion and literature	___	___	___	___	___	___	___
Introduce new products to the customer and so on . . .	___	___	___	___	___	___	___

Exhibit II. An Illustration of Section 2 from the MAPS Questionnaire

Listed below are all the participants in this analysis. With regard to the task items which you endorsed in Section 1, please indicate *how much you would like to work with each individual listed.*

For those individuals whom you are not familiar with, mark the category designated "don't know the person." Such a response is better than a guess. When your name appears, please mark your response toward the "none I'd like more" category for statistical purposes and to preserve your anonymity.

	Don't know the person.	Not at all.	Much below average.	Below average.	Average.	Above average.	Much above average.	None I'd like more.
John Doe	___	___	___	___	___	___	___	___
Bill Green	___	___	___	___	___	___	___	___
Sam Jones	___	___	___	___	___	___	___	___
Jim Smith	___	___	___	___	___	___	___	___
and so on . . .	___	___	___	___	___	___	___	___

design of eight subsystems. The latter solution was chosen since it had the highest coefficient of potential purposefulness.¹⁶ (The dean had preferred to present the faculty with the two most different solutions rather than suggesting just one solution or as many as three solutions.) Two comparisons were made:

- Did MAPS predict the right number and the right kind of actual subsystems?
- How correctly did MAPS place faculty members in actual subsystems?

MAPS was essentially correct on both comparisons. With regard to the first comparison, MAPS predicted seven out of eight actual subsystems without qualification. The orientations indicated by MAPS (the task variables most endorsed by each MAPS subsystem) were the same as the official study center orientations (the actual substantive title chosen by a group of faculty members). The one exception was a study center that was left out of the MAPS solution since most faculty listed in this subsystem showed stronger preferences for other subsystems.

With regard to the second comparison, MAPS placed 82 percent of the respondents on the correct organically-evolved study center. The members that MAPS had incorrectly placed either had indicated no preference for any of the eight MAPS subsystems, or had indicated more or less equal preferences for two or more of the MAPS subsystems. Stated differently, some faculty members, because of their mixed or neutral preferences as revealed on the MAPS questionnaire, were marginally placed on the wrong subsystem, perhaps by some error variance.

This illustration suggests that MAPS has considerable predictive validity for designing purposeful subsystems over a twenty-month time span.

Summary

We have presented organization design theory pointing toward the development of purposeful subsystems, along with a technology for achieving the design objective. Both the design objective and the technology are compatible with the values and objectives of popular Organization Development methods. The technology empha-

sizes multivariate analysis, participation, and structure: the MAPS method. The use of multivariate analyses, high-speed computers, and participation by all relevant organizational members makes this method both practical and supportive of OD philosophies and procedures.

Two illustrations are given on how MAPS has been applied to organizations that could benefit from this method. An important point to stress is that OD must be preceded by proper organization design and group composition if it is to be effective. Usually various OD programs are then needed to promote the subsystems' potential for effective problem solving, decision-making, communication, and leadership behavior, with a key problem being the integration of the subsystems' purposefulness into total organizational effectiveness. Good structural design is a necessary but not sufficient condition of organizational effectiveness; but good structural design is the necessary prerequisite to the effective development of formal organizational subsystems.

REFERENCES

1. W. French, "Organizational Development: Objectives, Assumptions, and Strategies," *California Management Review*, Vol. 12, No. 1 (1972), pp. 37-52.
2. E. H. Schein, et al., *Organization Development* (Reading: Addison-Wesley, 1969).
3. P. R. Lawrence and J. W. Lorsch, *Organization and Environment* (Homewood: Irwin-Dorsey, 1967); J. W. Lorsch and P. R. Lawrence (eds.), *Studies in Organization Design* (Homewood: Irwin-Dorsey, 1970).
4. R. B. Duncan, "The Implementation of Different Decision-Making Structures in Adapting to Environmental Uncertainty: An Expansion of Contingency Theories of Organizations," *Proceedings of the Academy of Management* (August 1972), pp. 39-47.
5. P. R. Lawrence and J. W. Lorsch, *Developing Organizations: Diagnosis and Action* (Reading: Addison-Wesley, 1969).
6. R. Ackoff and E. Emery, *On Purposeful Systems* (Chicago: Aldine-Atherton, 1972).
7. For a fuller treatment of purposefulness, see W.W. McKelvey, "Purposefulness in Organizations," Chapter 1 of a book by the same author, *Organization Science* (U.C.L.A., Graduate School of Management, Organization Studies Center, 1973).
8. H. J. Leavitt, "Applied Organizational Change in Industry: Structural, Technological, and Humanistic

Approaches," in J. G. March (ed.), *Handbook of Organizations* (Chicago: Rand McNally, 1965), pp. 1144-1170.

9. G. Watson, *Social Psychology* (Philadelphia: Lippincott, 1966).

10. M. Bucklow, "A New Role for the Work Group," *Administrative Science Quarterly*, Vol. 11 (1966), pp. 59-78.

11. W. G. Bennis, *Organization Development: Its Nature, Origins and Prospects* (Reading: Addison-Wesley, 1969).

12. R. L. Lippitt, *Organization Renewal* (New York: Appleton-Century-Crafts, 1969), p. 1.

13. H. H. Harmon, *Modern Factor Analysis* (Chicago: University of Chicago Press, 1967).

14. This example is taken from R. H. Kilmann, "The MAPS Method: Designing an Effective Organic-Adaptive Organization," *Personnel* (May-June, 1974).

15. This example is taken from W. W. McKelvey and R. H. Kilmann, "Participative Multivariate Differentiation Toward Purposefulness," *Proceedings of the Academy of Management* (August 1973).

16. The rationale and calculation of this coefficient is described in W. W. McKelvey and R. H. Kilmann, *op. cit.*, 1973.



Introduction to Enterprise

A SYSTEMS APPROACH

by Paul Kircher and Richard O. Mason,
University of California, Los Angeles

INTRODUCTION TO ENTERPRISE blends conceptual and procedural aspects of business for a one-semester course. It will serve as a business text for students who plan to take advanced business courses, and can also be used by students taking only one course in business. The book provides both non-majors and majors with an in-depth understanding of how business is used to make important professional decisions. The STUDY GUIDE, prepared by D. W. Williams and G. J. McKee, is a self-study manual that's keyed to the chapter objectives in the Kircher/Mason text.

1975

474 pages

\$12.95

Melville titles are available for examination purposes for college adoptions. To request a complimentary copy, please write on school stationery to Walker G. Stone, College Sales Dept. 347 Melville Publishing Company, 11661 San Vicente Blvd., Suite 913, Los Angeles, California 90049. Please include Course Title, Enrollment, and Current Text used.

A4770-MP



MELVILLE PUBLISHING COMPANY