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# *Organization Design for Knowledge Utilization*

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*Examining the growing literature* on knowledge utilization suggests that the majority of activity in the field takes place within an organizational setting where members and management are seeking to improve profitability, productivity, and/or the quality of products and services. What is a bit surprising is that the literature is primarily descriptive—reporting on how current organizations pursue knowledge utilization activities, or providing a list of the structural characteristics of organizations that seem to promote knowledge use (Zaltman et al., 1973). There appears to be little discussion that offers explicit guidelines or prescriptions on how organizations should change their structures or other management systems in order to improve various outcome measures. Stated differently, the literature on knowledge utilization is largely devoid of material on organization design.

This article attempts to fill some of this gap by scrutinizing the available research on organization design to see what insights, understandings, and prescriptions can be offered for improving the conduct of knowledge utilization. The objective is to expand the range of questions considered when a scholar or a practitioner is concerned with the creation, diffusion, or utilization of knowledge. Specifically, this article asks scholars as well as practitioners not to take the structure of organizations as fixed and unchangeable, but to research and manage organization design for their purposes, explicitly.

Perhaps it would be useful to discuss briefly how an organization design approach would view the “problem” of knowledge utilization.

This may help introduce the reader to the types of questions and concepts that are included in the study of organization design.

First, for knowledge utilization to take place in organizations and institutions in society, the organization design perspective sees that various resources must be *designed* into action. Knowledge utilization does not take place automatically; it requires organized activity that purposely structures such things as tasks, people, techniques, economic resources, information, objectives, authority, incentives and rewards into a knowledge-utilization design. It might even be argued that past efforts at knowledge utilization have been hampered by potentially ineffective designs. For example, an organization design that separates the conduct of research from the application of research from the initial perception of a need for research—placing all into different subunits or divisions of an organization—makes it exceedingly difficult to manage the whole knowledge utilization process. Keeping research and application in separate subunits of the organization may render knowledge utilization quite disjoint and inoperative if the research phase needs to flow quite smoothly from *and* into an action phase. An important organization design question might be: When should knowledge utilization take place in a separate subunit (division) of the organization or when should various knowledge utilization activities be conducted in and across different divisions of the existing organization?

Second, organizations are primarily designed to accomplish day-to-day tasks and objectives—to get a specific product or service out, to be profitable this year, to manage this immediate situation or crisis. Knowledge utilization, however, contains a long-term, reflective orientation: What new knowledge can be developed or be retrieved that will modify how the organization produces or markets its products or services in order to be more effective in both the short run and in the long run? Current organization designs, therefore, make it difficult to perform these longer-term, knowledge utilization tasks, especially if the sanctions, rewards, and incentives in the organization are geared to short-term results, which usually seems to be the case. An important organization design question might be: Can knowledge utilization thrive in an organization when most of the organization's culture, resources, and reward systems concentrate on immediate results?

Finally, past organization designs and practices may make current efforts at knowledge utilization more difficult because of the impact of past designs on the cognitive, emotional, and interpersonal styles of individuals engaged in knowledge utilization. Basically, because of prior

TABLE I  
 Organization Design for Knowledge Utilization (KU)

Question	Answer	Literature
Should KU take place in its own design or as a part of ongoing organizational activities?	Collateral designing	Zand, 1974
How should KU activities/tasks be organized into separate, manageable subunits?	Interdependency designing	Thompson, 1967 Galbraith, 1977
How should the internal-structural characteristics of each subunit be designed?	Differentiation designing	Lawrence and Lorsch, 1967 Lorsch and Lawrence, 1970 Lorsch and Morse, 1974
How should the separate subunits be integrated into a functioning whole?	Integration designing	Lawrence and Lorsch, 1967 Lorsch and Lawrence, 1970 Lorsch and Morse, 1974 Likert, 1961

experience and socialization in organizational settings, researchers and managers have difficulty in communicating and understanding one another. They adopt different goals, time orientations, and value systems, as well as focusing on different phases of problem-solving activity (Kilmann and Mitroff, 1979). Some of these differences are also due to selection, where individuals with particular cognitive styles are filtered into congruent jobs. But in either case (selection or socialization), these prior design experiences tend to reinforce if not exaggerate the distinctions in style between researchers and managers in addressing knowledge utilization issues. As will be discussed later, however, new designs can certainly confront these old differences and provide counterreinforcements to make these differences functional for the knowledge utilization process. Thus, organization structures and reward systems *can* be altered in the direction of supporting knowledge utilization objectives and activities.

Table I presents a summary of the key questions, their related concepts/principles ("answers"), and the supporting organization liter-

ature derived from applying organization design knowledge to the field of knowledge utilization. As can be seen from the table, the key questions concern (1) whether knowledge utilization should take place in its own design or as part of the ongoing activities of the organization; (2) how knowledge utilization activities should be organized into separate, manageable subunits (whether in its own design or meshed with the rest of the organization); (3) how the internal-structural characteristics of each subunit should be designed (for example, policies, reward systems, and the design of jobs); and (4) how the separate subunits involved in knowledge utilization should be coordinated into a fully functioning whole. The corresponding answers (concepts and principles) from organization design that pertain to these questions are, respectively, (1) collateral designing, (2) interdependency designing, (3) differentiation designing, (4) integration designing.

The remainder of this article discusses the literature cited in Table 1 to show how the four concepts and principles can be used to conduct knowledge utilization more effectively. Then a hypothetical case will be offered to illustrate how these principles might lead to a “nontraditional” design for knowledge utilization, different from previous efforts in the area. The article concludes with suggestions for researching some of the principles and prescriptions that are presented.

### ***Organization Design Knowledge***

Design has been defined as the arrangement and the process of arranging the organization’s structural characteristics (such as human, technical, economic, and informational resources, as well as authority and reward “systems”) in order to achieve efficiency, effectiveness, and adaptability (Kilmann et al., 1976). As noted above, concepts of design can suggest ways to organize for knowledge utilization, counter to current ineffective organization structures, and at the same time seek to compensate for previous organizational norms and selection/socialization practices.

#### ***Collateral Designing***

One line of organization design research has suggested that an organization may need to have more than one formal design since the

latter is primarily intended for addressing day-to-day, operational activities and objectives. A second formal design, known as the collateral organization (Zand, 1974), would be established to address longer-term problems and objectives. The need for this second distinct design follows from the highly structured, bureaucratic, power-authority type of operational design, which most organizations have, that does not encourage or reward long-term, problem-solving activities. Therefore, the second design, a more loosely structured, information-seeking, organic-adaptive type of design, is formally instituted and consists of representatives throughout the operational design subunits. These representatives would spend perhaps several hours per week or per month in this collateral design, while most of their time would be spent back in the operational design doing the day-to-day work.

Figure 1 shows the concept of the collateral organization by diagramming the traditional organization design (as represented by the formal organization chart) with its relationship to the second design, as indicated by the cross-section of members who come together in a different grouping (some of the time) in order to address more complex and longer-term issues than they address in their homogeneous, well-structured, "back home" divisions. In fact, the circles (rather than squares), symbolizing the design categories or grouping of the collateral organization, are meant to indicate a less structured, heterogeneous set of subunits or grouping. There would still be some form of hierarchy within and among the subunits of the collateral organization, but it too would be less structured and nontraditional, perhaps similar to the notion of Likert's (1961) linking pin. Here a member selected from each collateral subunit would form into an additional subunit to coordinate the activities and objectives of all the initial subunits, and would have the authority and sanctions to conduct such coordination tasks.

An important issue in forming the collateral organization is the selection of members, not only specifying which operational subunits will choose representatives for the collateral design, but which specific members. Usually, these decisions are made based on the overall purpose of the collateral organization, the belief concerning which areas of expertise and/or cognitive styles are necessary to pursue the purpose effectively, and an assessment of where and who in the formal, operational design would possess these knowledge areas and behavioral characteristics. Also, since the scope of the collateral design is complex and long-term, the purpose usually necessitates the collection of expertise and styles that go beyond one or a few operational subunits.

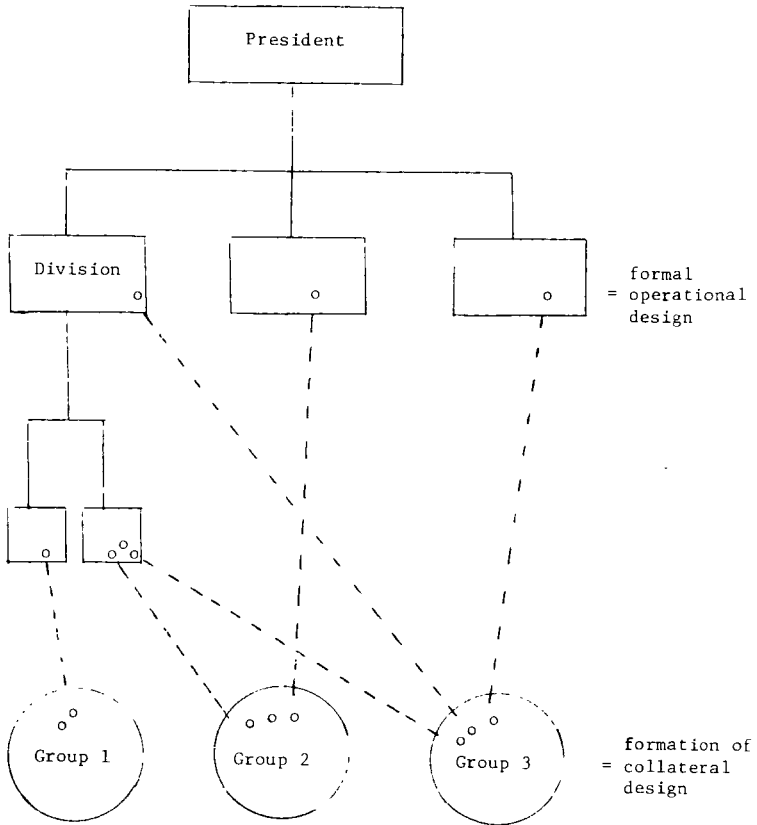


Figure 1: The Collateral Organization

Thus, the very nature of what will be addressed in the collateral organization necessitates a broad base of expertise scattered throughout the operational design. Furthermore, if the resolution, solution, or any end-products of the collateral design are to be accepted and implemented back in the operational design, then a wide representation is also suggested, since involvement (or represented involvement) tends to generate commitment and internalization (Argyris, 1970).

Once the members are selected for the collateral design, the actual groupings or subunits of this design must naturally be determined, including the objectives, focus, and internal structure of each subunit and the leadership structure across the subunits. Then the authority and reward system can be delegated by the “powers of the operational design” so that the collateral design can go about its activities and purpose. The actual determination of the subunit boundaries in the collateral design and such additional structural matters are based on other lines of research on organization design: the containment of interdependencies and contingency theory.

### *Interdependency Designing*

Thompson (1967) defines three types of interdependencies that can take place either within or between organizational subunits: pooled, sequential, and reciprocal. Pooled interdependence is when two or more tasks or activities can be performed relatively independently of one another, and in order to obtain certain outcomes or objectives, the separate outputs of each activity can be merely combined or pooled at some later time. With pooled interdependence, therefore, there is not much need to coordinate, plan, schedule, or communicate with respect to the separate tasks or activities before the pooling is performed; even then, the combining is rather straightforward and can be done according to standardized procedures. Sequential interdependencies, however, require that in order for the final outcome or end-product to be achieved, the separate tasks and activities must be combined in a certain sequence. Thus, task A is performed first, then B, then C, which results in the completion of an overall outcome, which, consequently, requires a certain amount of planning and scheduling across several activities in order to foster efficiency and effectiveness. Finally, reciprocal interdependencies occur when a constant or frequent cycling of interaction and input-output relationships takes place between various tasks and activities so that a “final” outcome can be achieved. For example, persons performing task A must constantly interact with those performing tasks B and C for the total task to be completed appropriately. Fostering and managing such ongoing and potentially complex interaction patterns among reciprocal-interdependent tasks, not surprisingly, requires additional coordinating mechanisms beyond procedures, plans, and schedules.

The three types of interdependencies, as implied above, have different associated costs of coordinating across the tasks in order to achieve a desirable outcome. Specifically, pooled interdependencies are least costly to coordinate because only procedures may have to be instituted at one point in time. Sequential interdependencies are more costly to coordinate due to the planning and scheduling that must take place before and during the performance of the tasks. Reciprocal interdependencies are the most costly, since coordination requires constant monitoring, communication, and “mutual adjustment” (Thompson, 1967). Incidentally, by “costly” is meant the consumption of time, energy, and money involved in managing the various interdependencies. Figure 2 summarizes the three types of interdependencies pictorially as well as indicating their relative costs.

A critical organization design issue concerns whether the interdependencies occur between tasks located in different subunits of the organization or the tasks in focus are all within some particular subunit. The premise is that the costs of coordination largely arise when tasks are located in different subunits, whereas the costs of managing interdependencies within subunits are generally much less or almost negligible in comparison. Apparently, drawing boundaries around tasks and people (that is, forming subunits) and requiring that the activities of one subunit be coordinated with the activities of another, is where the relative costs of different interdependencies are primarily manifested. It seems that interfacing across subunit boundaries is what generates the cost (time, energy, and money) of coordinating interdependencies. Coordination within a subunit seems to be greatly facilitated, at a minimum, by the physical proximity of individuals—the shared language, goals, concerns, and loyalties of the “group.”

More generally, the drawing of a boundary around a group of individuals tends to foster an identity, the possibility of group cohesiveness, team spirit, and the like. When such tendencies are augmented by a formal reward system that is geared toward specific subunit (departmental) goals as opposed to broader organizational goals (as is usually the case in formal organizational settings), intense intergroup competition may be evidenced. In essence, individuals within a group are rewarded for loyalty and productivity to their group goals and concerns—not to intergroup or organizational goals. Consequently, efforts to coordinate interactions between groups (because of reciprocal and sequential interdependencies, primarily) can become



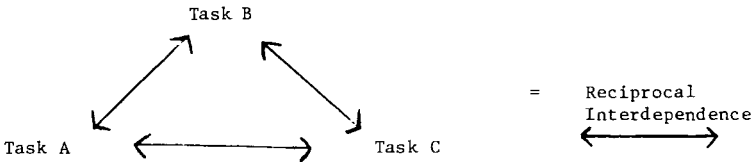
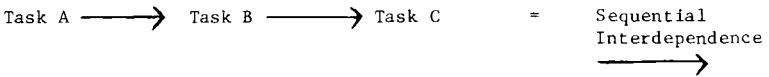
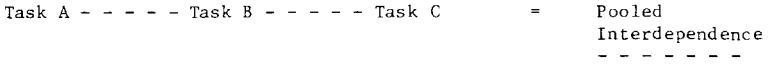


Figure 2: Task Interdependencies

NOTE: A, B, and C are hypothetical tasks involving various interdependencies to derive desirable outcomes.

quite costly because of the time and energy involved in resolving conflicts and in managing other side products of intergroup competition (Seiler,1963). The cohesiveness within groups, on the other hand, reduces the potential effects of interpersonal conflicts and disagreements. Besides, the reward system and goal focus within groups provide incentives and criteria for resolving differences far more readily, and hence at a much lower cost, than for conflicts between groups.

The implication of all this is that in order to minimize the general costs of coordinating and managing organizational tasks and activities, *the organization should design the most costly forms of interdepen-*

*cies within as opposed to between subunit boundaries* (Thompson, 1967). Specifically, the organization should specify as much as possible the boundaries of subunits to contain, first, most or all identified reciprocal interdependencies, then most or all of the sequential interdependencies, and finally pooled interdependencies. In most “real” settings, however, some interdependencies would be left between subunits since it may be quite impossible to come up with one set of subunit boundaries that contain all interdependencies within the design categories. But it is desirable, based on the foregoing arguments, to leave pooled interdependencies as the “residuals” or even some sequential interdependencies between subunits if necessary, as long as most of the reciprocal interdependencies are contained. This prioritization would lead to the minimum overall cost of coordination (management) of organizational subunits.

Galbraith (1977) has expanded on the Thompson approach to task interdependencies by emphasizing the information-processing requirements of task performance. Specifically, Galbraith suggests a number of methods to manage information and hence uncertainty, but for purposes here the “creation of self-contained tasks” is most relevant. By providing each subunit with all the necessary resources, authority, and responsibility to perform a self-contained cluster of tasks, uncertainty is decreased, since the subunit does not have to concern itself with tasks (inputs and outputs) assigned to other subunits in the organization. This is simply another way of describing the effect of containing reciprocal and sequential interdependencies within subunits, as discussed previously.

### *Differentiation Designing*

Once the boundaries of the organizational subunits have been specified to contain the most important interdependencies, two major design questions remain: (1) how to design the internal structure of each subunit, and (2) how to design the mechanisms to coordinate the residual interdependencies between subunits. These questions have been addressed by another line of organization design research known as contingency theory (Lawrence and Lorsch, 1967; Lorsch and Lawrence, 1970; Lorsch and Morse, 1974).

The concept of differentiation has been proposed and researched by contingency theorists in order to consider the internal structure of each subunit of the organization. Specifically, differentiation as a design

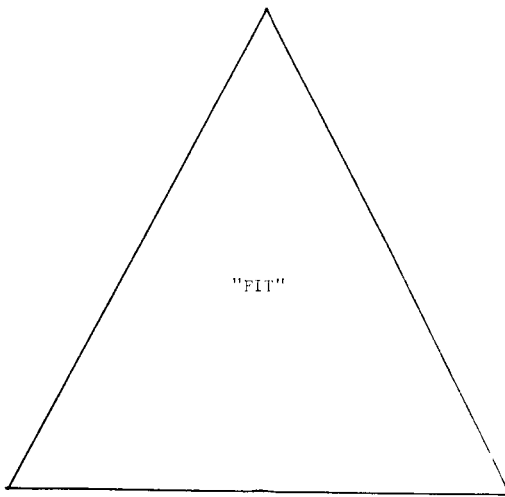
criterion suggests that given a particular set of design categories or subunits of an organization (that is, given the specification of subunit boundaries), each subunit should be internally designed to fit best with the characteristics of its task environment. For example, if the task environment or subenvironment facing a subunit is primarily stable, then a highly structured, traditional, bureaucratic design would best foster subunit efficiency and effectiveness (as in most production departments, for example). At the same time, if the members in the subunit are motivated and prefer to work in such a bureaucratic design (because of various motivational and personality characteristics), then the efficiency and effectiveness of the subunit are further enhanced because of this fit. On the other hand, if the task environment facing the subunit is dynamic and changing, then a more loosely structured, nontraditional, organic-adaptive design would be desirable (as in some R&D departments). In the latter case, individuals who are motivated and prefer to work in such a fluid design would best contribute to the efficiency and effectiveness of the subunit, given the necessary expertise and the like.

Figure 3 diagrams this contingency model of organization design, showing the proper fit of environment, subunit design, and members, once subunit boundaries have been specified. It is important to emphasize, however, that the extent to which the various subunits face different environments is the extent that the internal designs of the subunits would be different, ranging from the “pure” bureaucratic to an extreme organic-adaptive design (as well as suggesting the different types of individuals who could best staff the various subunits). This is the essence of differentiation in organization designing.

### *Integration Designing*

The second question addressed by contingency theory—how to design the mechanisms to coordinate the residual interdependencies between subunits—is handled by the concept of integration. It is recognized that even if most of the interdependencies are contained within subunit boundaries, the subunits themselves are still not entirely independent of one another. At a minimum, certain pooled interdependencies would remain, and more often than not some sequential and even reciprocal interdependencies would still be present in any complex organization. Integration is concerned with coordinating the subunits into a functioning whole. Often the use of a management hierarchy

TASK ENVIRONMENT OF SUB-UNIT  
(Stable vs. Dynamic)



INTERNAL DESIGN  
OF SUB-UNIT  
  
(Bureaucratic vs.  
Organic-Adaptive)

CHARACTERISTICS OF  
MEMBERS IN SUB-UNIT  
  
(Prefer high structure vs.  
Prefer loose structure)

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Figure 3: Contingency Theory

would constitute the primary form of integration (managers being responsible for coordinating the interdependencies of two or more subunits; managers to coordinate other managers; and so on). Other integrative mechanisms include committees, special task forces and project groups, the "informal" organization, and specially designed information links.

Besides the general need for integration across subunits, the more that the various subunits are designed differently (via differentiation), the more that additional integrative mechanisms, as mentioned above,

are necessary. Differentiated subunits tend to foster special communication problems and seem to generate problems of “misunderstanding” because of differences in subunit goals and time orientation as well as member differences in cognitive style, motivation, and even interpersonal behavior (across, rather than within, subunits). Thus, the residual interdependencies between subunits, including the differences in the internal structure of organization subunits themselves, call for integration in organization designing.

### ***Designing for Knowledge Utilization***

It is now appropriate to return to the issues raised at the outset, namely, can the knowledge of organization design be applied to improve the knowledge utilization process? Specifically, how can the concepts just discussed be used to design collateral organizations—organizing people, tasks, objectives, authority, and the like into particular subunits in order to pursue knowledge utilization activities?

A collateral organization is suggested, since knowledge utilization has a longer-term orientation than the typical day-to-day operational design. Also, knowledge utilization usually requires expertise from several parts of the operational design, involving managers with different substantive responsibilities as well as staff with research skills. Those who would be involved in the collateral organization would spend several hours per week working on knowledge utilization activities, while the remainder of their time would be spent back in the operational design. This dual responsibility, while potentially creating some adjustment problems (which usually can be managed with some special effort), tends to enhance the actual utilization of knowledge. Basically, some individuals who partake in the knowledge utilization process in the collateral organization are directly responsible for applying new knowledge in the operational design and are backed with the authority for doing so. Incidentally, these same individuals can also be instrumental in bringing to the collateral organization an on-line perspective of the needs for knowledge in the operational design.

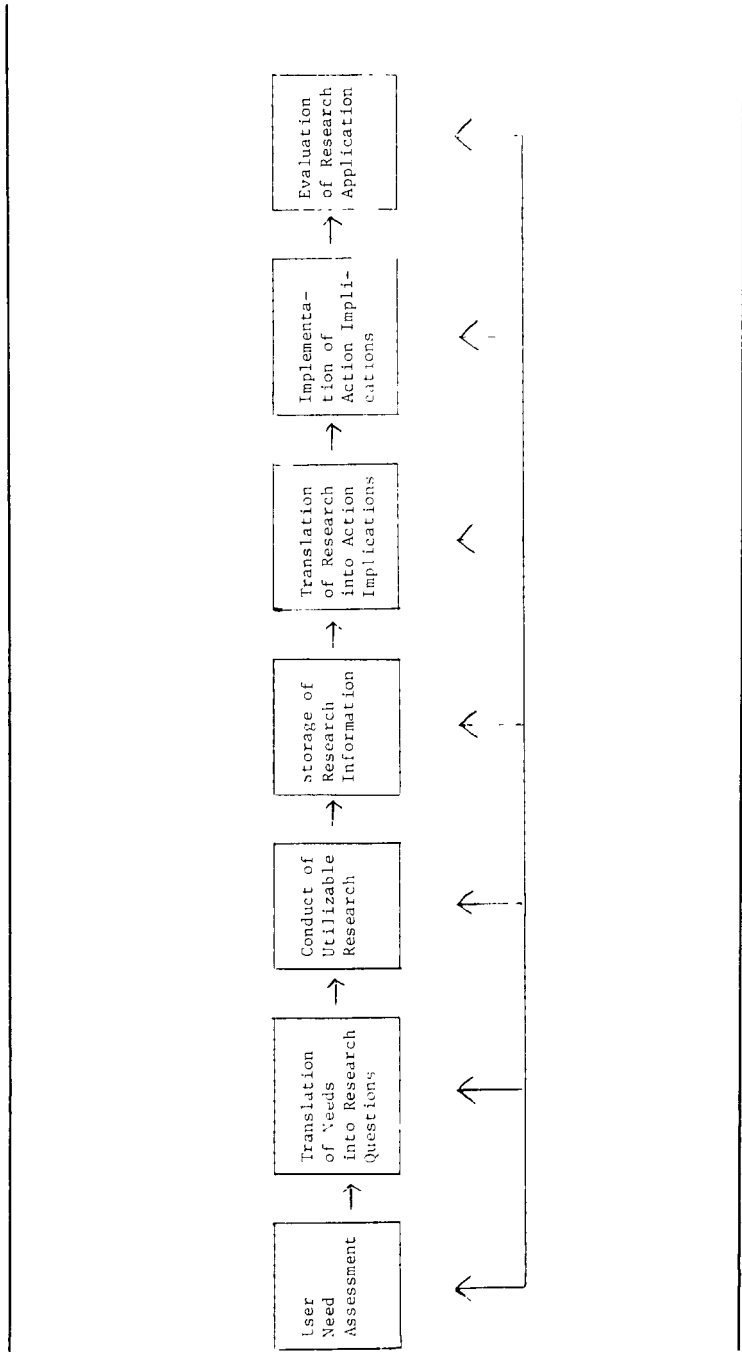
A major contribution from the literature on organization design is certainly the concept and principles of task interdependencies: first identifying the important tasks involved in knowledge utilization, then determining the interdependencies among them (reciprocal, sequential, and pooled), and finally drawing subunit boundaries around the most

important interdependencies (primarily reciprocal and sequential) so that the costs of managing the overall knowledge utilization process are minimized. But what are the appropriate tasks and associated task interdependencies of knowledge utilization?

Figure 4 shows a diagram of the generic knowledge utilization process as summarized by Zaltman (1977). The seven components are (1) user need assessment, (2) the translation of needs into research questions, (3) the conduct of utilization research, (4) the storage of research information, (5) the translation of research into action implications, (6) the implementation of action implications, and (7) the evaluation of research application. Each of the seven steps, however, would involve several if not many substeps or tasks in order to address its own objective as well as the overall goal of knowledge utilization.

The boxes around the seven components indicate that a subunit could be formed around each; therefore Figure 4 shows an organization design or collateral design for knowledge utilization. In fact, Zaltman (1977), in proposing a number of guidelines for conducting knowledge utilization, suggests that an ideal knowledge utilization group would have its functions (tasks) organized along these lines. There is a certain logic to these seven components and they constitute a useful theoretical taxonomy or framework for organizing knowledge utilization activity. But what is theoretically interesting or useful may not be an empirically valid approach to actually designing a knowledge utilization organization. Specifically, one must consider the types of interdependencies among all the implicit tasks subsumed under the seven components, and ask whether some other design of subunits would better contain the most important interdependencies.

In essence, Figure 4 is a stereotype for a knowledge utilization design, just like most organizations in society are organized by traditional, stereotyped functions. For example, industrial organizations usually are designed around production, marketing, and finance functions, even if they are designed along specific product lines or according to geographical area. Similarly, university departments are designed in regard to traditional scientific disciplines, hospitals via traditional medical specializations, and the same for governments, railroads, and so on. It is one thing if these traditional design categories were appropriate years ago, but because of changes in culture, values, technology, information, problems, and the very structure of knowledge (Toffler, 1970), these traditional designs may no longer contain the important



**Figure 4: Knowledge Utilization**

NOTE: From Zaltman (1977).

task interdependencies. In fact, any stereotyped design may result more from theoretical sense rather than from empirical or practical sense.

The major point is that *the traditional components of knowledge utilization do not necessarily contain the most important interdependencies, and an actual knowledge utilization effort designed via these functions may be severely constrained and ineffective*. It is interesting to note that Zaltman (1977) did portray the unidirectional arrows between the components shown in Figure 4, implying that significant sequential interdependencies were between rather than within these design categories! One might even argue that some of these cross-unit interdependencies may be reciprocal as well. And if the knowledge utilization efforts of organizations have been conducted according to these stereotyped components, it is apparent that knowledge utilization thus far has not benefited from knowledge of organization design—the major premise of this article. It is necessary, therefore, to explicate the numerous tasks implied in the seven theoretical components of knowledge utilization and then to derive empirically the actual types of interdependencies among these tasks before the subunit boundaries of a knowledge utilization, collateral organization are formed.

Perhaps it would be helpful to suggest how such a design process might take place. First, selection would be based on the expertise deemed necessary to partake in a knowledge utilization design. This could include managers, technical specialists, researchers from different departments in the operational design, and even members from the external environment (experts in knowledge utilization, clients and consumers, and so on). Next, these members would generate a comprehensive list of tasks relevant to conducting knowledge utilization effectively. The seven components of knowledge utilization shown in Figure 4 could be used as a basis for generating these more specific tasks. The final list would probably consist of 30 to 70 items that would be clear, concise, and understandable to all participants. The following is a likely listing:

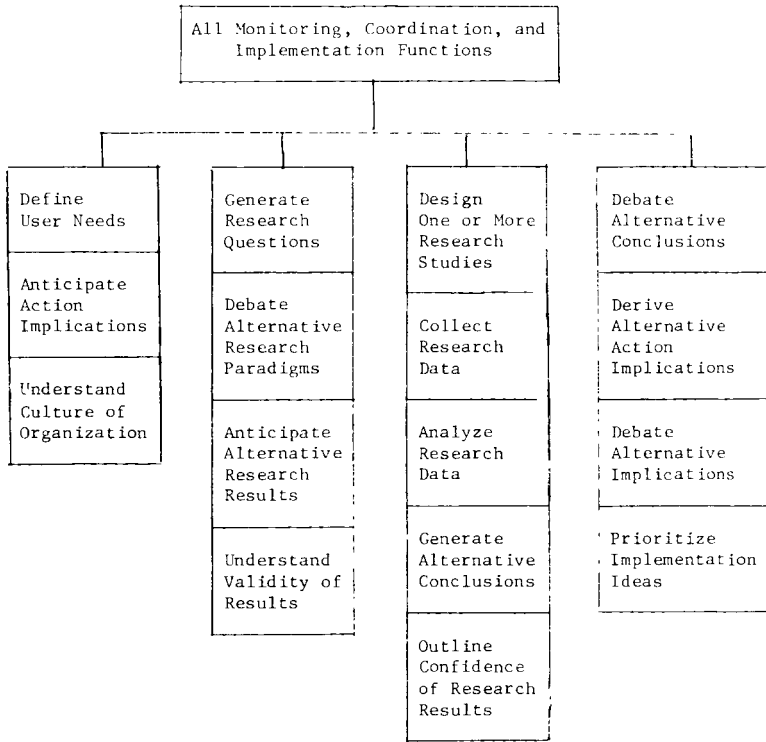
- (1) Define user needs.
- (2) Generate research questions.
- (3) Design one or more research studies.
- (4) Debate alternative research studies.
- (5) Anticipate action implications.
- (6) Debate alternative research paradigms.
- (7) Collect research data.
- (8) Derive alternative action implications.



- (9) Understand culture of organization.
- (10) Anticipate alternative research results.
- (11) Analyze research data.
- (12) Debate alternative action implications.
- (13) Understand validity of research results.
- (14) Generate alternative research conclusions.
- (15) Outline confidence of research results.
- (16) Prioritize implementation ideas.
- (17) Monitor process of user need assessment.
- (18) Coordinate and support research design process.
- (19) Guide implementation.
- (20) Evaluate implementation ideas.
- (21) Monitor and conduct debates on research issues.
- (22) Generate alternative implementation strategies.
- (23) Coordinate and support implementation process.
- (24) Maintain inventory storage of all research efforts.
- (25) Coordinate interaction among all research staff.

The members in the organization who will partake in the collateral design then would respond to a task questionnaire (Kilmann, 1977). This questionnaire would list each task as a separate item and ask respondents to indicate on a 7-point Likert scale (1 = not at all; 7 = extremely), how much he or she would like to work on each task, or to what extent he or she has the expertise to work on each task (or a combination of motivation and ability, as in expected success working on each task). The data collected from member responses to this questionnaire would then be processed through the MAPS computer program. Because of space limitations, the reader is referred to Kilmann (1977) for a detailed discussion of the multivariate statistics in MAPS. Suffice to say that the MAPS analysis searches out the reciprocal and sequential interdependencies from members' responses to task items (primarily through correlational and factor analysis) so that boundaries around clusters of tasks can be specified (leaving pooled interdependencies between subunit boundaries). The MAPS analysis also selects a group of people to work on each cluster of tasks based on respondents' assessments of their abilities (and/or motivations) to work on these tasks. Figure 5 shows the kind of knowledge utilization subunits that could result from an interdependency analysis (like MAPS), where nontraditional subunit boundaries are formed around the reciprocal and sequential interdependencies.

Incidentally, it should be recognized that the types of task interdependencies could vary from organization to organization, depending



**Figure 5: A Nontraditional Knowledge Utilization Design (four subunits plus hierarchy)**

NOTE: Reciprocal interdependencies largely within rather than between subunits; some sequential between subunits in terms of timing of activities; pooled between subunits fostering overall coordination and implementation.

on the unique focus of knowledge utilization in any particular setting, as well as on the people involved in the knowledge utilization process. There is simply no reason to believe that there is one ideal knowledge utilization organization of subunits, just as there is not a single ideal design for all types of organizations. The “ideal” specification for designs is contingent on numerous internal and external organizational factors (Lawrence and Lorsch, 1967).

Once the subunit boundaries are formed for a particular knowledge utilization, collateral organization, each subunit's "environment" is assessed to determine the type of differentiation (such as bureaucratic versus organic-adaptive) most appropriate for that subunit. For instance, if one knowledge utilization subunit is primarily concerned with brainstorming and the identification of complex problem areas, an organic-adaptive design would probably fit best with the task at hand. If some other subunit is to concentrate on the selection of research methodologies and the conduct of research studies, then a more bureaucratic design would foster efficiency and effectiveness (according to prescribed scientific criteria for conducting research studies). Naturally, the actual substance of each subunit must first be known before any properties of internal design can be suggested. Finally, integration (coordination) structures would be added across the knowledge utilization subunits. A management hierarchy, for example, would be needed in order to plan, schedule, and coordinate the interdependencies that still fall between subunit boundaries—since no design of subunits could contain all interdependencies perfectly.

## ***Conclusion***

The ultimate test of whether the concepts and principles of organization design do add to the field of knowledge utilization and, in fact, improve actual knowledge utilization efforts remains an empirical question. Research studies would have to be planned and conducted to examine the effects of different knowledge utilization designs in comparison with traditional efforts at knowledge utilization conducted within the operational design.

For example, one underlying hypothesis in this article concerns the central role that interdependency designing plays in the overall value of a knowledge utilization design (or any design, for that matter). Assuming that various field sites would be available for testing (field experiments or even case studies), a number of knowledge utilization designs could be formed: some according to the interdependency principles described earlier, some by ignoring the interdependency issues and randomly distributing tasks among subunits, some by purposely placing the most important task interdependencies between subunits rather than within, and some according to the theoretical

functions shown earlier in Figure 4 (Zaltman, 1977). Again, assuming that such alternative applications are feasible, let alone ethical, the effects of interdependency designing could be explored on a number of outcome variables pertaining to knowledge utilization.

The same approach could be applied to examine other steps in the design process, such as differentiation and integration unique to knowledge utilization or the very question of whether or not a collateral design for knowledge utilization is "better" than conducting knowledge utilization within the operational design of an organization. These research studies would help to demonstrate or at least to consider the generalizability of the principles of organization design to the field of knowledge utilization and, consequently, to articulate further the questions and "answers" proposed in this article.

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