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# A General Contingency Theory of Management

Fred Luthans
*University of Nebraska - Lincoln*, fluthans1@unl.edu

Todd I. Stewart
*United States Air Force*

The Academy of Management Review, Vol. 2, No. 2 (Apr., 1977), pp. 181-195. Used by permission.

# A General Contingency Theory of Management

**FRED LUTHANS**
University of Nebraska

**TODD I. STEWART**
United States Air Force

*Recent formal recognition of situational influences on the management of complex organizations has led to an increasing number of contingency models, but a comprehensive and integrative theoretical framework for contingency management has been lacking. A General Contingency Theory (GCT) of Management is introduced as an overall framework that integrates the diverse process, quantitative and behavioral approaches to management; incorporates the environment; and begins to bridge the gap between management theory and practice.*

A major goal of any academic pursuit is the development of an overall theory which can serve as a conceptual framework for understanding, research, and application (8). The search for such a theory in management has resulted in a myriad of complementary, but more often conflicting assumptions and constructs. About 15 years ago Koontz (22) identified six major theoretical approaches to management: process, decision theory, empirical, human behavior, social system and mathematical. He appropriately labelled the existing situation as the "management theory jungle". Today there are at least four widely recognized theoretical approaches to management: process, quantitative, behavioral and systems.

There has been a proselytic tendency on the part of theorists identified with the various ap-

Fred Luthans (Ph.D. — University of Iowa) is Professor of Management at the University of Nebraska, Lincoln.

Todd I. Stewart (M.S. — Southern Methodist University) is an officer in the United States Air Force and a doctoral candidate at the University of Nebraska, Lincoln.

*Received 7/26/76; Accepted 9/7/76; Revised 10/15/76.*

proaches. Prominent theorists promote their ascribed frameworks as conceptually valid and pragmatically applicable to all organizations in all situations, criticizing alternative approaches as conceptually weak, myopic in perspective and inapplicable to practice.

During the formative years of the theoretical development of management, the process approach dominated (11, 31, 41). But with the accelerating theoretical development, research and application of the behavioral and quantitative approaches, the process approach proved to be an inadequate theoretical framework.

In recent years, the systems approach has emerged as an important conceptual framework which attempts to integrate and redirect some divergent theoretical management constructs. Systems concepts such as the environmental suprasystem, the interrelated nature of constituent organizational subsystems, and system boundary permeability which lead to the concepts of "closed" and "open" systems have been particularly useful in integrating process, quantitative and behavioral constructs (21, 40).

The systems approach will undoubtedly continue to have a significant integrating effect, but it is not pragmatic enough to serve as a theoretical framework for the understanding, research, and practice of management (20). At the same time there is a growing awareness that the process, quantitative and behavioral advocates have been unable to substantiate their respective claims for universality. Although each construct from the various approaches to management has been effective in particular situations (12, 24, 36, 38), quantitative advocates have had considerable difficulty accommodating behavioral factors, and behavioral theorists have been only marginally successful in solving management problems more adaptable to quantitative approaches.

There is need for a new theoretical framework for management — not just another approach but one that can achieve the following goals:

1. Integrate and synthesize diverse process, quantitative and behavioral concepts into an interrelated theoretical system (26).
2. Functionally incorporate the systems perspective to organization and management, particularly in developing and defining specific functional relationships between situational factors, management concepts and applications, and organizational performance.
3. Provide a pragmatic basis for analyzing and interpreting the existing body of management knowledge and empirical research, thereby facilitating understanding, prediction and control (8).
4. Provide a framework for systematic and coordinated direction of new research on the complex functional relationships between management and situational variables.
5. Establish a mechanism for effectively translating theoretical constructs and the results of empirical research into management information and application techniques that are relevant and useful to the practitioner.

This article proposes that a General Contingency Theory (GCT) can best meet these important goals for the field of management.

## Toward a General Contingency Theory

### The Situational Approach

A situational perspective has been receiving increased attention. Partly the result of open systems thinking and probably more a direct result of the growing skepticism surrounding the universality assumption of other management approaches, the situational approach argues that the most effective management concept or technique depends on the set of circumstances at a particular point in time (3, 7, 26, 30).

Child (5) relates the situational approach to open systems thinking and the universalist approach to closed system thinking. There is a conceptual dichotomy between situational and universalist approaches. Although the universalist/closed-system constructs ignore potentially significant, but complicating, situational variables, they are easier to apply in practice. The situational approach takes a more conceptually realistic, but complex, open systems perspective, making practical application much more difficult. In other words, the situational approach achieves greater conceptual validity at the expense of practical applicability.

One way of resolving the dichotomy suggested by Child is to propose a synthesis of the two extremes. The goal would be to modify the situational approach in such a way as to maintain theoretical (open systems) validity, but, at the same time, improve its potential as a framework for practical application. A contingency approach seems best able to accomplish this goal.

**The Contingency Approach**

The contingency approach is generically situational in orientation, but much more exacting and rigorous. As used in this discussion, the contingency approach is defined as identifying and developing *functional relationships between environmental, management and performance variables*. There have been diverse contingency applications. Some of the more widely recognized include the following:

1. *Organization Design.* Woodward's (42) classic study of British companies demonstrated contingent relationships between environmental variables (technology), management variables (organization structure), and performance. Probably the most widely recognized work has come from Lawrence and Lorsch (24). Chandler (4) found a contingent relationship between environment, structure/strategy, and performance. There is also more recent work on contingency approaches to organization design (17, 38, 40).
2. *Leadership and Behavioral Applications.* Fiedler's (12) model demonstrated a contingent relationship between environmental variables, leadership style, and effectiveness. Other recent behaviorally oriented applications include models of job design (15) and behavioral change (27).
3. *Quantitative Applications.* Although specific applications are not yet developed, increasing attention is given to situational considerations. Groff and Muth note that:

   > the capabilities developed within the operations area should match the requirements of the firm. These requirements are determined primarily by the characteristics of the environment in which the firm operates (13, p. 4).

   Miller and Starr (29) developed specific contingency relationships between various situations and quantitative decision-making techniques that lead to effective performance.

The contingency approach has also played an important part in classification taxonomies for organizational systems. With the recent emphasis on open-systems models, many of these classification frameworks are based directly or indirectly on the nature of the organization's environmental suprasystem. Particular attention is devoted to the manner in which the organization interacts with its environment. Katz and Kahn (21), Burns and Stalker (2), Thompson (40), Terryberry (39), Perrow (34) and Etzioni (10) offer organizational typologies that are environmentally based. In general, these taxonomies were developed through a deductive methodology. In contrast, Haas, et al. (14), Pugh, et al. (35), McKelvey (28) and others have taken an inductive approach. They propose taxonomies developed empirically through multivariate analysis. McKelvey concludes:

> The recent flourishing of contingency approaches . . . is in fact a grassroots response to

> the absence of useful classifications . . . Organization and management researchers need contingency theories because there is no taxonomy to make it clear that one does not, for example, and only for example, apply findings from small British candy manufacturers to large French universities (28, p. 523).

## A Contingency Model of the Organization

The formulation of a General Contingency Theory of Management must start with a sound construct of the organization system. Drawing on the work of Katz and Kahn (21), Thompson (40), Churchman (6), Shetty and Carlisle (38), Lorsch and Morse (25), and Kast and Rosenzweig (20), an organization can be defined as a *social system consisting of subsystems of resource variables interrelated by various management policies, practices and techniques which interact with variables in the environmental suprasystem to achieve a set of goals or objectives.* The goals and objectives are defined by constituents of the social system in terms of relevant environmental and resource constraints. This definition emphasizes several important constructs relevant to development of a comprehensive contingency theory of management.

First, the systems paradigm is viewed as conceptually viable. A systems perspective is needed to emphasize the organization's inherent interaction with its external environment and, internally, the organization is comprised of interrelated subsystems. Second is identification of relevant system variables, which can be placed into a taxonomical hierarchy of primary, secondary and tertiary levels.

### The Primary System Variables

The primary variables are the elemental "building blocks" of the organization. Specifically, the primary system includes environmental, resource and management variables.

*Environmental Variables* — These factors affect the organization, but are beyond the direct or positive control of the organization's resource managers (6). Thompson (40) and others have emphasized that an organization can affect the environment in which it operates. In the context of this discussion, such influences are indirect results of the manager operating more directly on organizational resources to produce some desired change in the system. As the organization and its management gain more direct control over a segment of its environment, this segment is effectively annexed into the organizational system as its boundaries are expanded. As environmental variables are not subject to the direct control of management, they must be considered as "givens" or independent variables in the contingency framework.

A distinction is made between external and internal environmental factors. External environmental variables, such as federal legislation, are considered to be outside the organizational system. Internal environmental variables are also beyond the direct control of the manager in question, but are within the control of the formal organizational system. For example, the environment for a middle manager is not only affected by those factors external to the organization but, probably more important, by the internal environment (e.g., top management policy) over which he or she has no control.

Another important refinement is to distinguish between specific and general variables. Specific environmental variables affect the organization directly and significantly, while general environmental variables have only an indirect influence on the organization and provide a context for the more directly relevant specific factors. A synthesis of the classification schemes offered by Duncan (9), Hall (16), Kast and Rosenzweig (20) and Negandhi (32) suggests the following representative general environmental variables: cultural, social, technological, educational, legal, political, economic, ecological and demographic. Representative specific environmental variables would include customers/clients, suppliers (including labor), competitors, technology and socio-political factors.

*Resource Variables* — These are tangible and intangible factors over which management has more direct control and on which it operates to produce desired changes in the organizational system or its environmental suprasystem (6). Clearly particular variables may transfer between environmental and resource states (with reference to a specific manager or group of managers), as management gains or loses direct control over such factors. For example, if an organization depends on the independent commercial trucking industry for delivery of supplies and distribution of products, its means of transportation is effectively an environmental variable. Should this same organization acquire its own trucks and drivers to gain control of this transportation variable (i.e. expansion of the organization's system boundaries), the transportation factor is now a resource variable.

Many system variables simultaneously exhibit both environmental and resource characteristics. Extending the transportation example, even though an organization may own its own trucks and employ its own drivers, these drivers, while employees of the organization (and therefore resource variables), are also likely to be members of the Teamsters Union and not subject to the total control of management. The extent to which management's influence over these operators is limited is a measure of the environmental quality of this system variable. A particular system variable can be a resource variable to one manager and an environmental variable to another manager in the same organization. In the final analysis, the manager is also (at least partially) a resource to superiors and a critical factor in the environment of subordinates.

Resource variables can be classified as human and non-human. *Human resource variables* include both demographic characteristics such as number, skills, knowledge, size, race and age, and behavioral characteristics including individual and social behavior and such attendent concepts as needs, attitudes, values, perceptions, expectations, goals, group dynamics and conflict. *Non-human resource variables* include such elements as raw materials, plant, equipment, capital and product or service. Since the set of resource variables on which the manager operates is a "given" at any particular point in time, they too, like environmental variables, are treated as independent variables in the contingency function.

*Management Variables* — A manager is defined as any individual within the organization system having formal authority to make decisions affecting the allocation or utilization of available resources. Management variables are those concepts and techniques expressed in policies, practices and procedures used by the manager to operate on available resource variables in defining and accomplishing system objectives. Recognizing the eclectic nature of the contingency construct, process, quantitative and behavioral concepts are all represented as management variables. On a more micro perspective, process variables include planning/goal-setting, organizing, communicating and controlling. Behavioral variables can be further classified into individual (motivational techniques, reward systems, etc.) and group/inter-group (organization development techniques, leadership styles, etc.). Quantitative variables can be classified into areas such as decision-making models and information/data management.

*Relationship Between the Primary Variables* — Relationships between the primary system variables are illustrated in the Venn diagram of Figure 1. This figure illustrates the role that management plays in coordinating interaction of the resource subsystem and environmental suprasystem. Specifically, it illustrates the concept proposed by Thompson (40) in which the management subsystem serves as a "buffer" between the uncertain environment (i.e., the set of stochastic environmental variables) and what he called the organization's "core technology".

## The Secondary System Variables

Figure 1 also illustrates the secondary system variables, which result from interaction of subsets of the primary variables. As shown, there

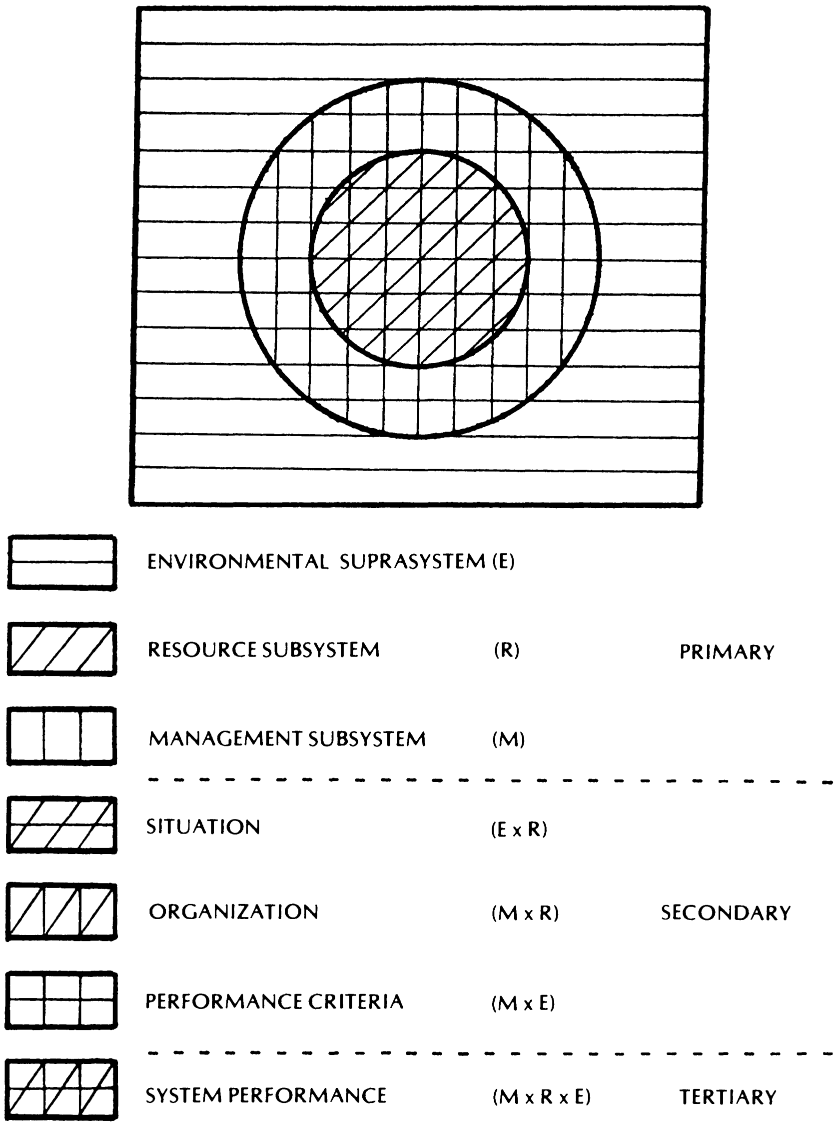


**FIGURE 1. A Contingency Model of the Organization System.**

are three important secondary system variables: situation, organization and performance criteria.

*Situation Variables* — The set of variables defined by the interaction of environmental ($E$) and resource ($R$) variables are called situational variables in the secondary subsystem. This set describes the given state of the organization system with which the manager must interact and operate.

*Organizational Variables* — The intersection of managerial ($M$) and resource ($R$) variable sets results in a secondary subsystem variable set defined as operational organizational variables. This set presents a relatively closed-system description of a particular state of "the organization" at a given point in time, without reference to the environmental suprasystem in which the organization operates.

An example of the organizational variable set is the familiar construct of organizational structure. Structure is, in and of itself, a theoretical concept commonly used to describe the set of formalized or sanctioned social relationships existing between members (primary/resource variables) of the organization system. With regard to the formal organization, these social relationships have been developed by management to facilitate the accomplishment of organization goals. This characterization should not imply that structure, as an organizational variable, is completely independent of environmental variables. The research of Lawrence and Lorsch (24), Woodward (42) and others has clearly demonstrated the correlation between structure and environment. However, the concept of closed-system organizational variables emphasizes that the structure is not *determined directly* or *caused* by the environment. Management develops structure in consideration of (among other factors) environmental variables. The degree to which management is successful in developing a structure compatible with its perception of the environmental suprasystem is reflected in organizational performance.

*Performance Criteria Variables* — The third set of secondary subsystem variables is determined by the intersection of the environmental ($E$) and management ($M$) variable sets. The critical product of this intersection is a set of performance criteria variables relevant to a particular organizational system. Of direct significance to the manager are organizational goals which are conceived to be desired or acceptable levels of performance. These levels are measured by the respective performance criteria variables. A major goal for the manager, particularly the top level manager with strategic decision making concerns, is to effectively analyze the relevant set of environmental variables to determine the continuing viability of the organization's performance criteria and associated goals. The object of this analysis is to determine what changes must be made in the allocation of available resources to achieve and/or sustain acceptable performance as measured against specific performance criteria.

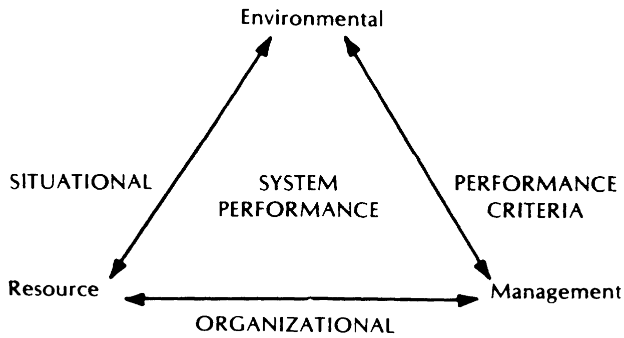


**FIGURE 2. A Summary of the Variables and Relationships in a Contingency Model of the Organization.**

### The Tertiary System Variables

The third level of hierarchical system variables is generated by the interaction of secondary system variables (and, therefore, constituent primary system variables). The product of this interaction is defined as the set of *system performance variables*, which represent the actual performance output of the organization as measured by relevant performance criteria variables. As previously suggested, goals or objectives are defined as a specific subset of these organizational performance variables. This set of performance variables is perhaps the single most distinctive feature of the contingency model, setting this model apart from theoretical constructs that do not emphasize this important link between theory and practice (e.g., 2, 20, 32, 36).

Figure 2 illustrates the relationships between primary, secondary and tertiary variables. It is an illustrative compendium of the conceptual contingency model as a theoretical foundation for developing a GCT framework for management.

## General Contingency Theory

As Dubin (8) notes in his thorough discussion of theory construction, a theory must include both conceptual units (variables) and lawful relationships between these variables. The contingency model illustrated in Figures 1 and 2 depicts relevant constituent variables and suggests the general form of the functional relationships between these variables. To facilitate discussion of these GCT functions, the following notation is introduced:

$E$ = the primary set of environmental variables
$R$ = the primary set of resource variables
$M$ = the primary set of management variables
$S$ = the secondary set of situational variables $(E \times R)$
$O$ = the secondary set of organizational variables $(M \times R)$
$PC$ = the secondary set of performance criteria variables $(M \times E)$
$P$ = the tertiary set of performance variables as measured against $PC$
$P^*$ = the subset of $P$ which meets or exceeds desired or objective levels of performance
$f$ = function of
$X$ = the interaction/intersection of
$s.t.$ = subject to/such that
$.GE.$ = greater than or equal to

From the contingency model of the organization, it is apparent that system performance is a function of the interaction of subsystem variable sets. This suggests that a GCT function will be of the following general form:

1. $P = f(E \times R \times M)$

Here, system performance ($P$) is cast as the dependent variable, while environment, resource and management variable sets are independent. Further, the situational variable set can be expressed as:

2. $S = f(E \times R)$

Consequently, substitution of expression 2. into expression 1. yields:

3. $P = f(S \times M)$

Expression 3. is particularly revealing as it emphasizes the inherent situational nature of the contingency approach (i.e. system performance is a function of the interaction of situational and management variable sets). From a more pragmatic perspective, the practicing manager is primarily interested in that subset of functions in which performance exceeds the desired minimums.

4. $P = f(S \times M) \quad s.t.\ P\ .GE.\ P^*$

Theoretically, it can be argued that in any organizational system, all primary, secondary and tertiary variables are continuous in nature, i.e., there exists an infinite number of variable states (8). But from a more realistic perspective, these system variables can be reasonably approximated by a finite number of discrete and independent variable states. Under this assumption, each of the constituent variable sets can be indexed to represent these discrete states. For example:

5. $S_i \quad i = 1,2,\ldots,l$

6. $M_j \quad j = 1,2,\ldots,m$

Using this indexed notation, expression 6. can be written as:

7. $P_{ij} = f(S_i \times M_j) \ s.t.\ P_{ij}\ .GE.\ P^*_{ij}$

Further, by similarly indexing specific performance criteria as:

8. $PC_k \quad k = 1,2,\ldots,n$

Expression 7. can be extended and refined as:

9. $P_{ijk} = f(S_i \times M_j \times PC_k)\ s.t.\ P_{ijk}\ .GE.\ P^*_{ijk}$

The general functional relationship of expression 9. indicates that a particular level or state of system performance ($P_{ijk}$) is a dependent variable which is functionally determined by the in-

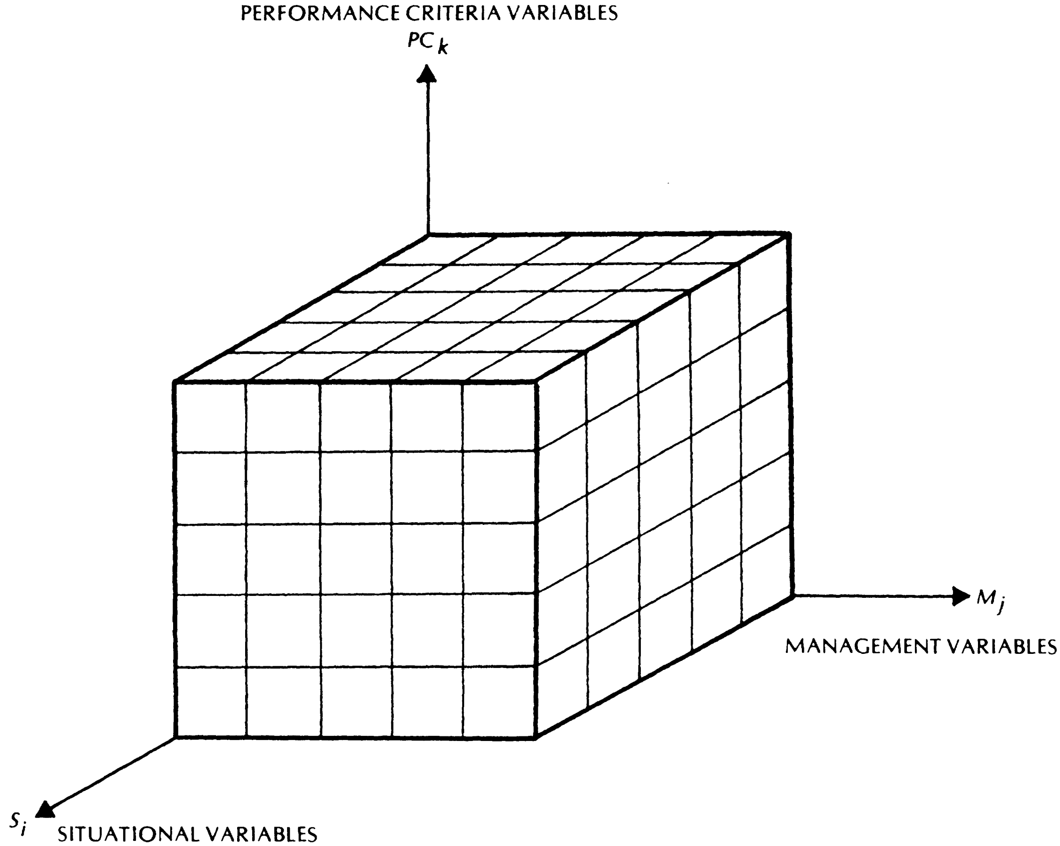


**FIGURE 3. A General Contingency Matrix for Management.**

teraction of independent situational, management and performance criteria variables in states $S_i$, $M_j$ and $PC_k$.

### The GCT Matrix

The general form of the contingency function of expression 9. suggests the possibility of organizing these system variables and relationships as a three dimensional conceptual matrix (see Figure 3). The respective axes represent nominal scales along which are aligned the various independent and discrete states of $S_i$, $M_j$ and $PC_k$. The matrix cell $(i, j, k,)$ determined by the intersection of these variable states holds the associated dependent value of system performance ($P_{ijk}$). This conceptual contingency matrix provides the integrating framework necessary for the development of a GCT of Management. As Dubin (8) observes, a simple collection of propositions or, in this case, contingency functions, does not constitute a theory. A theory depends on a lawful relationship between these functions. The GCT matrix provides the theoretical framework necessary to organize and relate these contingency functions and to facilitate the continuing development of a true general theory of management.

The effectiveness of the matrix as a framework for a GCT of management is postulated from comparison of its characteristics with those definitive objectives required for such a general theoretical approach to management. First, the $M_j$ axis includes management concepts and application techniques from the process, quantitative and behavioral schools. These concepts are systematically integrated by their functional interaction with specific situational and performance criteria variables, as well as to the resultant level of system performance or output. Secondly, the GCT matrix, derived directly from a systems-based model of the organization, incorporates both environmental and resource factors as constituent elements of these situational variables. The matrix framework functionally relates these independent situational variables to management concepts, performance criteria and system performance. Thus the matrix also satisfies the third definitive objective, providing a pragmatic basis for organizing, analyzing and interpreting the existing body of management knowledge.

*Implications for Research* — The GCT matrix can also provide an integrating framework for existing research findings and serve as a guide for future research. Churchman notes that:

> . . . so much social research is conducted in a fragmented way in which enormous amounts of data are collected, correlated and filed away in reports that at best have a mild interest to the reader, and at worst are totally irrelevant for decision-making purposes (6, p. 102).

The empty cells of the matrix indicate specific combinations of situational, management and performance criteria variables for which a functional relationship to system performance has yet to be defined. The framework can also be used to identify contingency functions that require validation by rigorous, empirically-based research methodologies. For example, functions that have been derived deductively from case studies are candidates for validation through replication in controlled laboratory or field experiments.

Finally, the framework can serve as an important vehicle for inductively or deductively generating hypotheses for testing and validation. The framework itself provides a data base upon which secondary or indirect research can be conducted. For example, by holding $M_j$ and $PC_k$ variables constant and varying $S_i$, functional relationships could be developed relating a given management concept or technique at a given performance level across a range of situations. Only after a particular management variable $M_j$ has been systematically and empirically validated across a wide range of situations $S_i$ could a practical claim for universality be justified. In this way, research progress could be made in an orderly, systematic manner, thereby building an integrated, valid general theory of management.

*Implications for Management Practice* — Perhaps the acid test of the GCT matrix is its potential for translating theoretical constructs and associated empirical research data into management information and application techniques that are relevant to the practitioner. The key to facilitating this application is development of an operational matrix, i.e. a data base of contingency functions organized in the format of the GCT matrix framework. Development of an operational GCT data base in turn depends on availability of the data reduction instruments necessary to translate the existing body of management research into functional contingency relationships. To be of value to the practitioner, these data reduction instruments, or a complementary set of diagnostic instruments, must also be effective in analyzing, measuring and defining the current state of system variables in operational organizations. In addition, storing and manipulating the vast amount and wide variety of data implied in an operational GCT data base matrix requires efficient and effective automated data processing hardware and software. For example, a GCT matrix dimensioned at only 100 discrete states on each axis generates an array of one million cells or system state combinations. Consequently, the development of a realistic GCT data base depends in part on availability of adequate computer support.

These problems represent formidable barriers to application of the GCT approach to management. Their resolution would provide the manager with a powerful tool for diagnosis of organizational systems and implementation of planned change designed to improve performance.

With such an automated GCT data base matrix and the associated diagnostic instruments, a manager could periodically conduct a "contingency audit" to identify and measure the current states of relevant system variables and highlight specific performance criteria for which system performance is less than the corresponding objective value. By programmatically comparing results of the contingency audit with the GCT data base, the information system could provide the manager with alternate management applications that have resulted (or are likely to result) in an acceptable level of system performance in a similar situation.

With development of an automated GCT data base, selection of the intervention strategy can be made more effectively. Using simulation and sensitivity analysis techniques, potential intervention strategies can be tested and evaluated without incurring the associated investment and opportunity costs. This process for applying the GCT approach to management practice is summarized more formally in the following algorithm:

*Step 1: The Contingency Audit*

a. Identify through diagnostic techniques the current state of system variables:
   1. The situation ($S_i$), as defined by the interaction of environmental and resource variables.
   2. The existing set of management variables ($M_j$).
   3. Relevant performance criteria ($PC_k$) and associated goals ($P^*_{ijk}$ or, if constant over $S_i \times M_j$, $P^*_k$).
   4. System performance states ($P_{ijk}$).

b. Identify those system performance criteria ($PC_k$) for which $P_{ijk}$ is less than $P^*_{ijk}$.

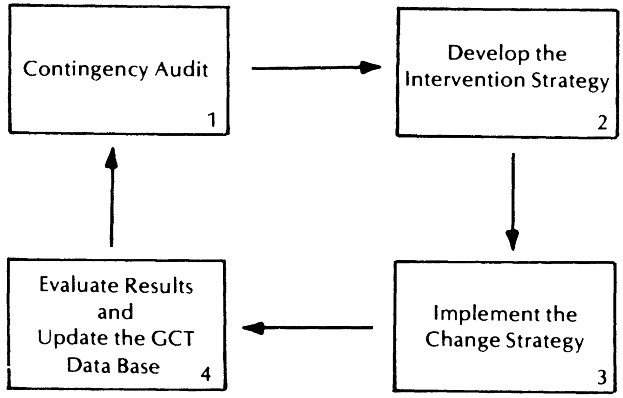


**FIGURE 4. A Contingency Approach to Managing Planned Change.**

*Step 2: Develop the Strategy for Planned Change*

a. For those criteria ($PC_k$) for which $P_{ijk}$ is currently less than $P^*_{ijk}$, identify those states in the conceptual matrix (the existing data base) for which $P_{ijk}$ .GE. $P^*_{ijk}$ for all values of $k$.

b. Using a specific criterion (e.g., performance/cost ratio), determine from acceptable alternates the most effective change strategy, considering changes in management and resource variables, thereby changing the situational state.

*Step 3: Implement the Change Strategy*

*Step 4: Evaluate the Results of the Change Intervention*

a. Determine if management and/or situational variables have been changed to the target state as intended.

b. Determine if $P_{ijk}$, GE. $P^*_{ijk}$ for all values of $k$.

c. Determine if the results of the intervention are consistent with the results predicted by the data base.

d. Update the data base to reflect the results of the intervention (to insure the continuing accuracy and validity of the data base).

The steps of this algorithm are illustrated in the schematic of Figure 4.

A specific example is described in the finite conceptual matrix of Figure 5. Assume that the Step 1 diagnosis reveals that the organization is currently in the state represented by $(S_4 \times M_1)$. Step 1 would also identify unsatisfactory performance against, for example, criteria $C_3$ (i.e. $P_{4,1,3}$ is less than $P^*_{4,1,3}$). In a systematic search of the matrix, $(S_4 \times M_2)$ and (at least) $(S_2 \times M_4)$ result in performance levels that exceed the associated $P^*_{ijk}$. However, adopting a change strategy that results in system state $(S_4 \times M_2)$ suggests that performance will become unsatisfactory as measured against criteria $PC_1$ and $PC_4$. In contrast, system states $(S_4 \times M_3)$ and $(S_2 \times M_4)$ both satisfy all performance objectives. Based on this determination, the system manager selects the most potentially effective intervention strategy, i.e., to change the management variable from $M_1$ to $M_3$ in situation state $S_4$, or to change both management and situational (resource) variables from $(S_4 \times M_1)$ to $(S_2 \times M_4)$. The actual choice of intervention would depend on the decision criteria employed by the manager.

## Operationalizing the GCT Framework

A number of complex developmental problems must be resolved if the GCT matrix construct is to be effectively operationalized and extended beyond the state of intellectual exercise. First, an operational taxonomy must be developed that effectively defines and measures the state of each primary and secondary system variable. Such a taxonomy must be comprehensive enough to handle the highest order of operational measures (nominal, ordinal, interval and ratio scales) that can be validly applied to a particular system variable state. Ideally, these variable taxonomies must describe both a system variable value in its steady-state mode, and also such critical parameters as state stability/state dynamics and the relative deterministic/stochastic nature of the variable state value.

Instruments and techniques must be developed to apply these system variable state taxonomies to source data. Essentially, this problem breaks down into two specific applications. First, data reduction instruments must be devised to translate the research data currently reported in the management literature into appropriate taxonomical dimensions included in the GCT matrix data base. Secondly, a similar set of instruments and techniques is required to support the contingency audit of an operational organization. Such diagnostic tools provide the necessary operational link between the data base of empirically-expressed management contingency functions and the complex problematic realities confronting the practicing manager.

A second fundamental problem attendant to development of an operational GCT matrix is expression of the contingency functions themselves, i.e. the lawful relationships between the various system variable state values. Like the state variables which constitute the other necessary component element of a true theory, these relationships must be operationally defined. Any scheme for expressing these functions must effectively accommodate the range in types of interactions reported in the management research literature.

Dubin (8) recognizes a relative hierarchy of three general forms of interaction expressions. *Categoric laws* of interaction indicate that the value of one system variable is *associated* with the value of another. *Sequential laws* of interaction express *time ordered* relationships between the values of two or more system variables. *Sequential laws* are commonly used to suggest *causal* relationships between various system variable states. A *deterministic law* of interaction is one that associates *specific deterministic values* of one system variable with deterministic values of another. GCT contingency functions may be categoric, sequential or deterministic.

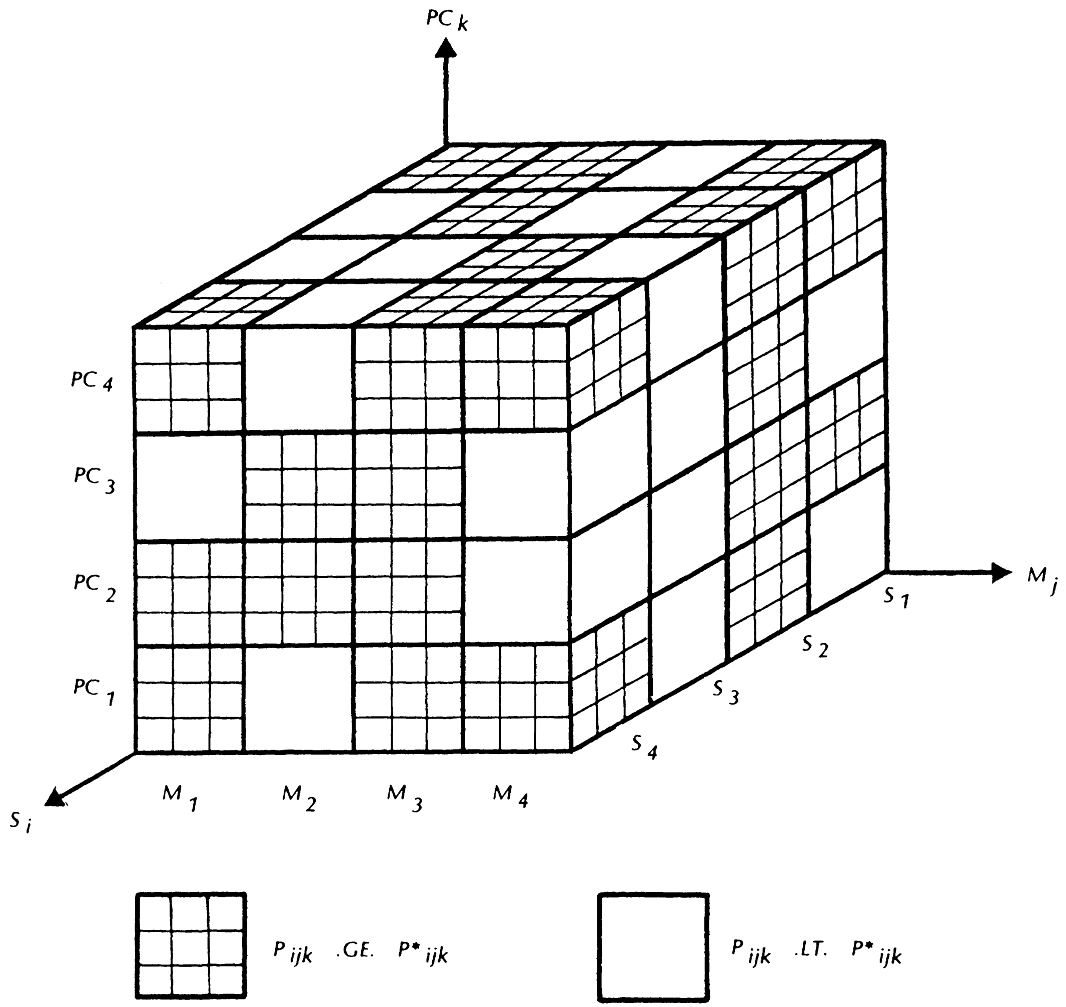


**FIGURE 5. An Example of a Finite Contingency Matrix.**

The third major problem is development of a computer software code capable of effectively and efficiently processing the tremendous amounts of data involved with operationalizing a GCT data base matrix of meaningful capacity. Developing this code requires consideration of such factors as input/output modes, input/output formats, storage requirements, data analysis options, advantages/disadvantages of various programming languages and system hardware compatability.

The problems confronting development of an operational automated GCT matrix data base are complex. Just as research is a continuing process, the development, expansion and refinement of the data base to include an increasing number of system variable states and functional contingency relationships is an unbounded effort, commensurate with development of management knowledge. This process of operationalizing the GCT matrix has been initiated by the authors in the form of descriptive research designed to identify and discuss specific problems, assumptions and decision processes attendant to development of operational system variable taxonomies, data reduction and contingency audit instruments, operational measures of contingency functions, and a computer code for feasibility testing.

## Conclusions and Implications for the Future

In spite of the significant practical problems to be resolved, GCT offers the theorist, researcher and practitioner a real and potential framework for integrating existing contingency approaches and for orchestrating future management research and development. As the rate of change and the associated degree of complexity continues to accelerate, the influence of environmental variables will be increasingly significant to effective management. This increasing environmental impact should make a contingency approach to management more important in the future. However, if the contingency approach is to realize its potential as an effective construct for maintaining and improving managerial effectiveness in a hyperdynamic environment, its development must proceed in a systematic, unified and directed manner. The General Contingency Theory of Management is offered as a conceptually-pragmatic, research-based framework with considerable potential for impact on the future course of management.

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