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Adaptation: A Promising Metaphor for Strategic Management[1]

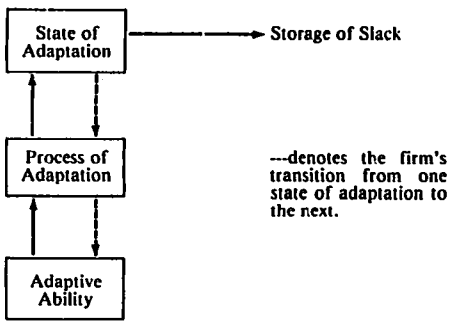
BALAJI S. CHAKRAVARTHY
University of Pennsylvania

Strategic management is the process through which a manager ensures the long term survival and growth of a firm. This paper provides a comprehensive framework for strategic management based on adaptation, a metaphor that succinctly captures the endeavors of an organization to be fitted better to its environment

The essence of management is coping with change. A manager copes with change in the firm's external environment through the choice of an appropriate strategy and the design of a matching structure (Andrews, 1971). However, as Ansoff (1979) observes, such a strategy-structure fit cannot be an enduring one. Strategy is not the solution to a single problem. Even as the firm transforms itself to meet the needs of the original problem, the underlying problem could have undergone enormous changes. The solution may be inappropriate to the new problem. The process of continuously adapting to the changes in a firm's environment is called strategic management (Schendel & Hofer, 1979).

Strategic management is needed not only to cope with changes in the firm's external environment but also to cope with changes caused by processes internal to the firm (Scott, 1971; Greiner, 1972). It would, in fact, seem that the surplus or "slack" (Cyert & March, 1963) created by a successful strategy would itself be a destabilizing influence on that strategy. The firm has more resources as a consequence and can therefore seek new activities. However, a distinction needs to be made between strategies of action triggered by changes in the external environment and a "strategy of structure" that addresses the question: "How do we configure the resources of the firm for effective response to unanticipated surprises" (Ansoff, 1979). Ansoff points out that practically all of management literature has focused on the former, but the latter, that is, "strategy of structure," has been largely ignored. It is the aim of this article to provide a comprehensive conceptual framework incorporating both types of strategy. Because the primary purpose of strategic management is adaptation, i.e., to fit the firm more particularly for existence under the conditions of its changing environment, the framework is built on three concepts borrowed from the literature on adaptation. Figure 1 presents the proposed framework in its skeletal form.

Figure 1
A Skeletal Model of Adaptation



States of Adaptation

A state of adaptation, in a biological sense, describes a state of survival for an organism. Analogously, a state of adaptation for a business

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organization is one in which it can survive the conditions of its environment. There may be several niches available to a firm for surviving the conditions of its environment. These niches can be further arranged in a hierarchy based on the extent of environmental complexity attempted to be handled by the firm. The higher the environmental complexity that can be handled by a firm, the better are the chances of its long term survival and thus the higher is its level of adaptation. Three such levels are proposed here. The proposition derives from Simon's (1969) parallels definition of the three modes that are open to a system for coping with its environment: passive insulation, reactive negative feedback, and predictive adaptation.

Each level of adaptation represents a cluster of niches that have a common characteristic and that correspond to a state of adaptation. Three such states are defined: unstable, stable, and neutral. The terminology, borrowed from mechanics, aptly describes the distinguishing characteristics of the three states. The unstable state is the most vulnerable to changes in the firm's environment, a neutral state is the least vulnerable, and a stable state is vulnerable only to certain environmental changes.

In the *unstable* state, a firm tries to buffer itself from its environment, as it is extremely susceptible to environmental changes. The manager of such a firm, concerned with the fragility of the firm's adaptation, is on the lookout continuously for new buffering arrangements. It is possible for a firm in this state of adaptation to show good financial results in the short run. However, its longterm viability is severely constrained and vulnerable. Called "defenders," such firms have narrow product-market domains, and they seldom seek to make major adjustments in their technology, structure, or methods of operation. Such firms deliberately create stability through a series of decisions and actions that lessen the organization's interaction with its environment. "While perfectly capable of responding to today's world, a defender is ideally suited for its environment only to the extent that the world of tomorrow is similar to that of today" (Miles & Snow, 1978, p. 47). Or, as Miles and Cameron (1977) state, such an organization adapts by simply ignoring environmental events or demands.

A *stable state* describes the state of adaptation in which instead of buffering itself from the environment, the firm is open to it and, in fact, offers a reactive move in keeping with every move of the environment. The firm reacts to environmental changes and complies with environmental mandates (Miles & Cameron, 1977). Although the firm lags environmental change, its response time is extremely short. Called an "analyzer," such a firm has a buffered core like the defender, but unlike the defender it also has extensive market surveillance mechanisms that enable it to imitate the best of products and markets developed by others (Miles & Snow, 1978).

In a *neutral state,* a firm can withstand most environmental changes because they have been anticipated before their occurrence and the firm has invested in the requisite adaptive ability. The environment may even have been modified to suit the organization's needs. Called "prospectors," these organizations continuously are searching for market opportunities. They often create changes in their environment, to which their competitors must respond. "A true prospector is almost immune from the pressures of a changing environment since this type of organization is continually keeping pace with change, and...frequently creating change itself" (Miles & Snow, 1978, p. 57). Miles and Cameron (1977) describe three different strategic choices that seem open to a firm in a neutral state:

1. Forecasting or anticipating environmental events so as either to restructure for them in advance or to prevent their occurrence.
2. Absorbing noxious or threatening environmental elements.
3. Adapting the environment to the firm's preferred goals and modes of operation.

The properties of the three states of adaptation described are summarized in Table 1.

All the three states of adaptation are viable ways of coping with the environment. Defender, analyzer, and prospector are all "stable" forms of organization. "If management chooses to pursue one of these strategies, and designs the organization accordingly, then the organization may be an effective competitor in the particular industry over a considerable period of time" (Miles & Snow, 1978, p. 14).

All states of adaptation, however, do not have the same immunity from environmental changes. The neutral state has the highest immunity, followed by the stable and unstable states. A firm seeking to ensure its future should prefer a neutral state of

Table 1
Three States of Adaptation

Proposed in This Paper	*The Nature of Coping Exhibited in This State (Simon)*	*Nomenclature Used by Miles and Snow (1978) for Firms in this State*	*Nature of Interaction with Environment*
Unstable State	Passive Insulation	Defenders	Defensive
Stable State	Reactive Negative feedback	Analyzers	Reaction
Neutral State	Proactive Adaptation	Prospectors	Proaction

adaptation over the other two states. But, then, why don't all firms show such a preference? The answer to that question has two parts:

1. The state of adaptation that a firm aspires to is predicated on the resources that it commands, that is its adaptive ability.
2. Further, the nature of management processes within these firms (broadly called the process of adaptation) influences the state of adaptation sought.

Adaptive Ability

As mentioned earlier, the three states of adaptation lie in a hierarchy ascending from an unstable state and progressing to a neutral state of adaptation. The higher the level of adaptation, the higher is the environmental complexity that can be handled by the firm. A firm can be made to handle higher environmental complexity if its repertoire of information is expanded continuously and its ability to exploit such repertoire is correspondingly improved (Galbraith, 1973). This can be done by improving the firm's differentiation and integration, respectively (Lawrence & Lorsch, 1967). Christenson (1973) defined a property of the firm called level of organization, which is a composite of its differentiation and integration. The level of organization of a firm, relabeled "organizational capacity" in this paper, thus is directly related to the state of adaptation that can be sought by a firm.

Organizational capacity, which measures the information processing ability of the firm, is an aggregate measure of the human resources of that firm. However, as business policy literature—for example, Andrews (1971)—would suggest, adaptation also is determined by the extent and nature of the firm's material resources. Miles and Cameron (1977) make a similar suggestion and define an "environmental receptiveness cluster" which influences the state of adaptation. Under this cluster, they include:

1. Resource scarcity: The extent to which elements in the input environment of an organization are lean in needed resources.
2. Internal resources: Defined as the generalizability of a firm's core technology and expertise, and the extent of its "slack."

Material resources of a firm include input materials, finance, and technology. The extent of these resources is not measured in absolute terms, but by their relative abundance for that industry. The latitude available to managers in the exploitation of these material resources is another important determinant of a firm's material capacity. For example, a manager pressed for short term profits is unlikely to devote attention to resources that require a long lead time for exploitation. The extent of material resources and the latitude available for their exploitation together determine the range of strategies open to a manager.

It thus would appear that the human and material resources available to a firm influence its state of adaptation. In both cases, the extent of the resource and the latitude available for its exploitation define the strategic capacity provided by that resource (Table 2). Adaptive ability is shaped by the firm's organizational capacity (ORGCAP) and material capacity (MATCAP).

Organizational Capacity

Several studies have examined the information processing ability of different organizational arrangements. Two ideal types that emerge from these studies are the mechanistic arrangement and the organic arrangement (Table 3).

A mechanistic arrangement is excellently suited to stable environments. A firm in such an environment has fairly stable goals, and its strategic

Table 2
Determinants of Adaptive Ability

Resource	*Extent*	*Usability*	*Composite Measure*
1. Human	Differentiation	Integration	Organizational capacity (ORGCAP)
2. Material			
i. Input materials	Relative abundance	Latitude for exploitation	Material capacity (MATCAP)
ii. Finance			
iii. Technology			

response can be shaped by systematic optimization models. In contrast, for a more complex and unstable environment, an organic arrangement is the best suited. Strategic response in such an environment involves a constant revision of goals and is characterized by heuristic, disjointed incrementalism. The organic arrangement can process a greater variety of environmental information than that processed by a mechanistic arrangement.

ORGCAP was defined earlier as the informational processing ability of a firm. To the extent that an organic arrangement processes more varied information, its ORGCAP is higher than that of a mechanistic arrangement. In a mechanistic arrangement, top management alone is involved in the shaping of the firm's strategic response. It is characterized by a highly boss-centered leadership. Important strategic signals from the lower levels of management often are ignored because authority in the firm is based on one's position in the organization. Such an arrangement limits access to external information, and the firm consequently can deal only with an environmental complexity lower than that possible under an organic arrangement. An organic arrangement is more open to external information. Authority in the firm derives from exper-

Table 3
Contrasting Mechanistic and Organic Arrangements[a]

Subsystems	*Mechanistic System Characteristics*	*Organic System Characteristics*
1. Environmental scanning	Routine, standardized procedures	Nonroutine, flexible arrangement
2. Formal organization	High specificity of tasks, functions and roles	Low specificity of tasks, functions, and roles
	Authority based on position	Authority based on knowledge
	Power concentrated at the top	Equalization of power, flat organization structure
	Conflicts not normally surfaced, but resolved by superior, compromise or smoothing	Conflicts resolved by group (situational ethics) and open confrontation
3. Reward system	Emphasis on extrinsic rewards, security and lower level needs	Emphasis on intrinsic rewards, esteem, and self-actualization
	Finite supply of rewards; zero sum game	Supply of reward dependent on environment plus non zero sum game
	Influence based on manipulation of income and economic security	Influence based on linking individual to organizational goals
4. Planning, control, and information system	Problem solving characterized by algorithmic, systematic optimization models	Problem solving characterized by heuristic, disjointed incrementalism, satisficing models
	Take goals as given	Concerned with revision of social system boundaries
	Uses standard information taxonomies and standard sources of information	Uses special purpose information and open to information exchange with other systems
5. Leadership style	Boss centered	Subordinate centered

[a]Sources: Kast and Rosenzweig (1973); Duncan, (1971); Normann (1976).

Table 4
Relating ORGCAP With States of Adaptation

Organizational Arrangement	*Basis of Authority*	*ORGCAP*	*State of Adaptation Most Appropriate to the ORGCAP*
Mechanistic	Position	Lean	Unstable
Bureaucratic	A combination of both position and expertise	Moderate	Stable
Organic	Expertise	Rich	Neutral

tise regardless of one's position in the organization. The arrangement is characterized by a participative leadership style.

In between the two ideal types of organizational arrangements lies another, which provides neither a predominantly position-based authority like a mechanistic arrangement nor an expertise-based authority like an organic arrangement. For want of a better term, such an arrangement is called bureaucratic. In a bureaucratic firm, strategic response is shaped largely by formal planning systems, whereby subordinates are allowed to participate on a limited basis in the evaluation and elaboration of a strategy, identified by top management. The firm is neither predominantly boss-centered nor entirely participative or subordinate-centered. It is closest to being systems-centered.

The three organizational arrangements identified here correspond to the three states of adaptation described earlier (Table 4). The suggested relationship parallels that described by Miles and Snow (1978). For a defender, they recommend an organizational arrangement characterized by a functional structure, centralized control, long-looped vertical information systems, and conflict resolution through hierarchical channels. In sum, the arrangement suggested is ideally suited to maintain stability and efficiency, but it is not well suited to locating and responding to new product or market opportunities. Miles and Snow's (1978) description corresponds closely to the definition of a mechanistic organizational arrangement.

For a prospector, Miles and Snow recommend a product structure with low division of labor, a low degree of formalization, decentralized control, short-looped horizontal information systems, and resolution of conflicts through integrators. This is an arrangement ideally suited to maintain flexibility and effectiveness. It fits the description of an organic organizational arrangement.

The analyzer, a hybrid of mechanistic and organic arrangements, aims at balancing stability and flexibility. Its coordinating mechanisms necessarily are extremely complex and expensive. Systems play an important role. The analyzer's organization resembles a bureaucratic arrangement.

Material Capacity

When MATCAP of a firm is poor, the firm is preoccupied with conserving its limited resources. The strategic choices open to the firm tend to be limited because of the scanty material resources available to it. Moreover, given its extremely limited latitude for experimentation, its choice tends to be conservative. In contrast, a firm with unlimited material resources and a larger latitude for experimentation can explore several strategic options.

The latitude for experimentation is influenced by two factors:

1. The importance of the firm's short term performance to its financial viability—constant pressure for short term results can divert a manager's attention from strategic goals.
2. The extent of financial risk that a manager is allowed to take—the greater the risk, the more proactive the stategies that can be explored. In anticipating the environment there is always the danger that a manager may guess wrong. But such risk seeking behavior may have to be encouraged if proactive strategies are desired.

There is an obvious relationship between the material capacity of a firm and the type of strategy that it can pursue. A firm poorly endowed with material capacity is preoccupied with the conservation of its limited resources and is likely to prefer defensive strategies. In contrast, a firm richly endowed with material capacity is likely to seek proactive strategies. A firm endowed with rich material resources but constrained in its latitude to exploit these resources is likely to opt for low risk reactive strategies, strategies that are imitative (Quinn,

Table 5
Relating MATCAP with States of Adaptation

Strategy	Material Resources		MATCAP	State of Adaptation Associated with MATCAP
	Relative Abundance	Latitude for Exploitation		
Defensive	Low	Low	Lean	Unstable
Reactive	High	Low	Moderate	Stable
Proactive	High	High	Rich	Neutral

1979). The three distinct strategic responses described above are associated with the three states of adaptation proposed in this study (Table 5).

Adaptive Ability and States of Adaptation

In the previous section a definite relationship was shown to exist between organizational capacity, material capacity, and states of adaptation. Figure 2 summarizes this relationship. Three types of adaptive fits can be identified in Figure 2: unstable fit, stable fit, and neutral fit.

Unstable fit is the equilibrium condition in which a defensive strategy and a mechanistic organizational arrangement are matched. The firm tries to buffer itself from the environment as it is extremely susceptible to environmental changes.

Stable fit is the equilibrium condition in which a reactive strategy and a bureaucratic organizational arrangement are matched. The firm has enough material capacity to respond to several environmental changes. However, given the limited latitude for exploitation available to its managers, decision making is often reactive.

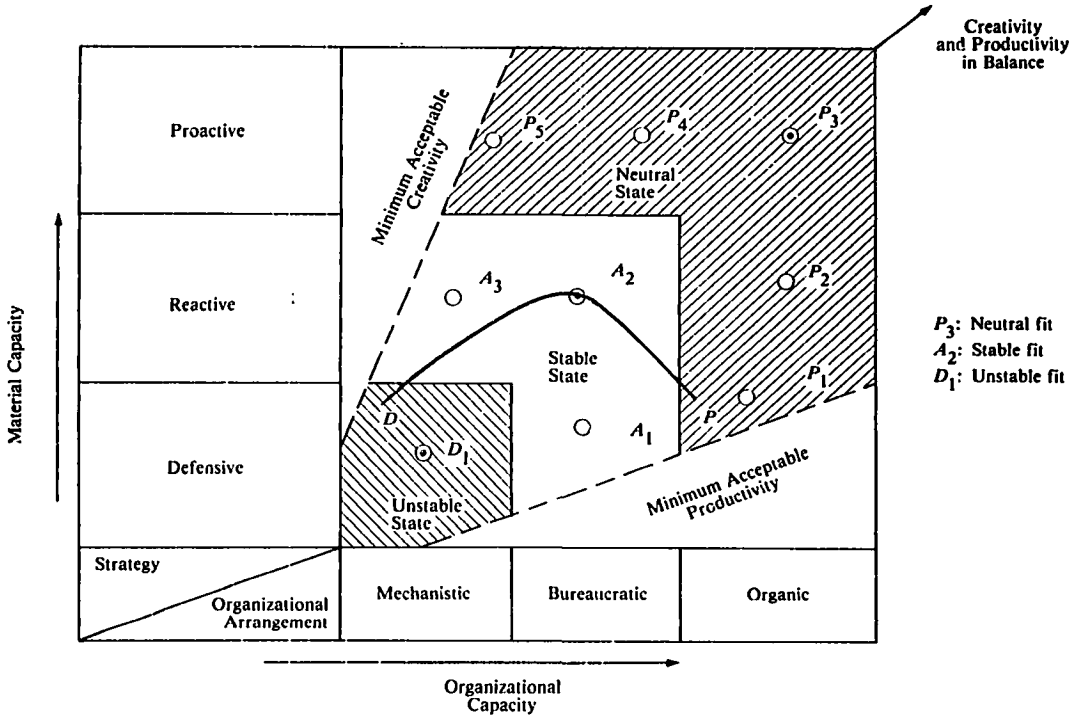
Neutral fit is the highest equilibrium condition and occurs when a proactive strategy and an organic organizational arrangement are matched. The firm has an ideal match of both material and organizational capacities for its managers to make innovative decisions. The firm's vulnerability to environmental changes is likely to be the least because its managers can anticipate most environmental changes before they occur.

It is important to distinguish between states of adaptation and adaptive fits. Whereas a state of adaptation ensures survival, an adaptive fit ensures *in addition* the optimal use of the material and organizational capacities of a firm. Survival of a firm requires that its effectiveness and efficiency be kept within desired limits (Ashby, 1971). Effectiveness has to do with the choice of a purpose acceptable to the environment, and efficiency presumes that the "contributions" generated by the firm in meeting its purpose are at least equal to or greater than the "inducements" it has to provide to ensure the cooperation of its stakeholders (Barnard, 1938). Effectiveness requires a constant reexamination of purpose and the selection of alternate purposes—an innovative activity. Efficiency requires, in contrast, a productivity orientation. Clearly the degree of innovation or productivity required of a firm varies from industry to industry. For example, the auto industry until recently was described as having tolerated more of a productivity orientation with minimal demands on innovation (Abernathy, 1978). Whereas a state of adaptation can represent varying emphases on creativity and productivity (within the limits for survival in a given industry), an adaptive fit represents an optimal balance between creativity and productivity (Figure 2).

It is important to note that a defender, analyzer, or prospector need not necessarily be adaptively fitted. As shown in Figure 2, P, P_1, P_2, P_3, P_4, and P_5 are all prospectors, but only P_3 is adaptively fitted. Thus, one can conceive of a prospector having moderate or even low organizational or material capacities, depending on the industry. In fact, the curve $P\,A_2\,D$ may trace the path of one such prospector P, that chose to ride the entire product life cycle. Although such a firm is adapted to its environment at all times, it is adaptively fitted only at A_2. However, instead of moving the firm from a totally creative orientation to a totally productive orientation, as the life cycle implies, managers may choose instead to keep creativity and productivity in relatively better balance. As described earlier, adaptive fits D_1, A_2, P_3 are points of such balance.

Firms outside of these adaptive fits can move to a point of fit through the process of adaptation. In general, a defender, analyzer, or prospector is distinguished by the highest fit that it can aspire for. Thus, at best, a defender can seek an unstable fit,

Figure 2
Adaptive Abilities, States of Adaptation, and Adaptive Fits



an analyzer a stable fit, and a prospector a neutral fit. In the process of such a transition, these firms may be misfitted temporarily. It is in the nature of adaptation to transcend misfits before achieving an adaptive fit. Firms under such a transition should be distinguished from firms, called reactors, whose pattern of adjustment to the environment is "both inconsistent and unstable" (Miles & Snow, 1978, p. 81). The inconsistency stems from three sources: (1) failure to articulate a viable strategy, (2) inappropriate linkage of strategy to technology, structure, and process, and (3) pursuit of a strategy-structure fit no longer relevant to the environment. A reactor cannot adapt to its environment. It is important to note that a firm in a state of adaptation can at times show inappropriate linkages or misfits similar to those that a reactor would show. It is not the misfits per se that should classify a firm as a reactor. A firm in a state of adaptation is misfitted with a purpose; it may be in transition to a point of fit. At any rate, such a firm has the ability to manage misfits, but a reactor is incapable of managing misfits.

The Process of Adaptation

The process of adaptation includes two subprocesses. Dunn (1971) called these adaptive specialization and adaptive generalization. Adaptive specialization is the process of improving the goodness of fit in a given state of adaptation. It refers to the rationalization of processes and structure using available MATCAP and ORGCAP for moving to the nearest adaptive fit. Adaptive generalization refers to the process that improves the survival potential of the organization. It is the aim of adaptive generalization to enhance the material and/or organizational capacity of a firm as

required to move it to the next higher state of adaptation.

Adaptive specialization has been discussed at great length in the business policy literature. It involves the choice of a strategy appropriate to the environment and resources of the firm, and the design of a matching structure. Adaptive generalization, in contrast, is a little understood process.

In order to understand adaptive generalization, a successful firm, adaptively fitted with its environment, is considered. In such a condition of fit, the firm generates a surplus of contributions over the inducements that it provides. This surplus is called "slack" (Cyert & March, 1963). Slack is normally identifiable in monetary terms. It can be paid back to stakeholders as added inducements, advance payments to secure their sacrifices in times of future adversity for the firm. Alternatively, the slack can be used to build the material and organizational capacities of the firm. Managing slack is the key to adaptive generalization. Christenson describes how slack should be managed:

> The manager or designer of an organization who wishes to increase its capability for the long run should "invest" any capacity his system has to do work in excess of its current maintenance requirements to create conflict-resolution mechanisms of the preferred kind. That is, he should *overintegrate* the system relative to what a "fit" theory would call for. Then he should seek to provide as much cognitive conflict as his system can handle effectively, by increasing the flow of environmental information. That is, he should *overdifferentiate* the system relative to the subjective environment. The natural tendency of the system, then, as it seeks to restore its internal equilibrium, will be to increase the complexity and sophistication with which it perceives the environment. (1973, p. 46).

The process of adaptive generalization thus requires that an old fit be consciously disturbed for the sake of a new and higher fit. However, the process not only requires an improvement in the organizational capacity of a firm, as suggested by Christenson, but also an improvement in the firm's material capacity. Furthermore, once the firm acquires these additional capacities, mere "natural tendencies" will not make it adaptively fitted once again, as suggested by Christenson. The process of fitting a firm at its new and higher state of adaptation was defined earlier as adaptive specialization. This is a consciously managed process.

The process of adaptation includes both of the above named subprocesses: adaptive generalization or *managing misfits* and adaptive specialization or *managing for fits.*

A Comprehensive Framework for Strategic Management

Strategic management now can be described in the language of adaptation (Figure 3). An important part of strategic management is adaptive specialization. This involves:

1. Managing the choice of purpose for the firm so as to exploit its material and organizational capacities optimally.
2. Minimizing the misfit, if any, in the match between the chosen purpose and the firm's organizational and material capactities, by making the appropriate improvements in either of the two capacities so as to bring them in balance, or by revising the chosen purpose, or both.

In a state of fit, a firm generates surpluses called slack. Skillful management of slack by the general manager will ensure adaptive generalization for his firm.

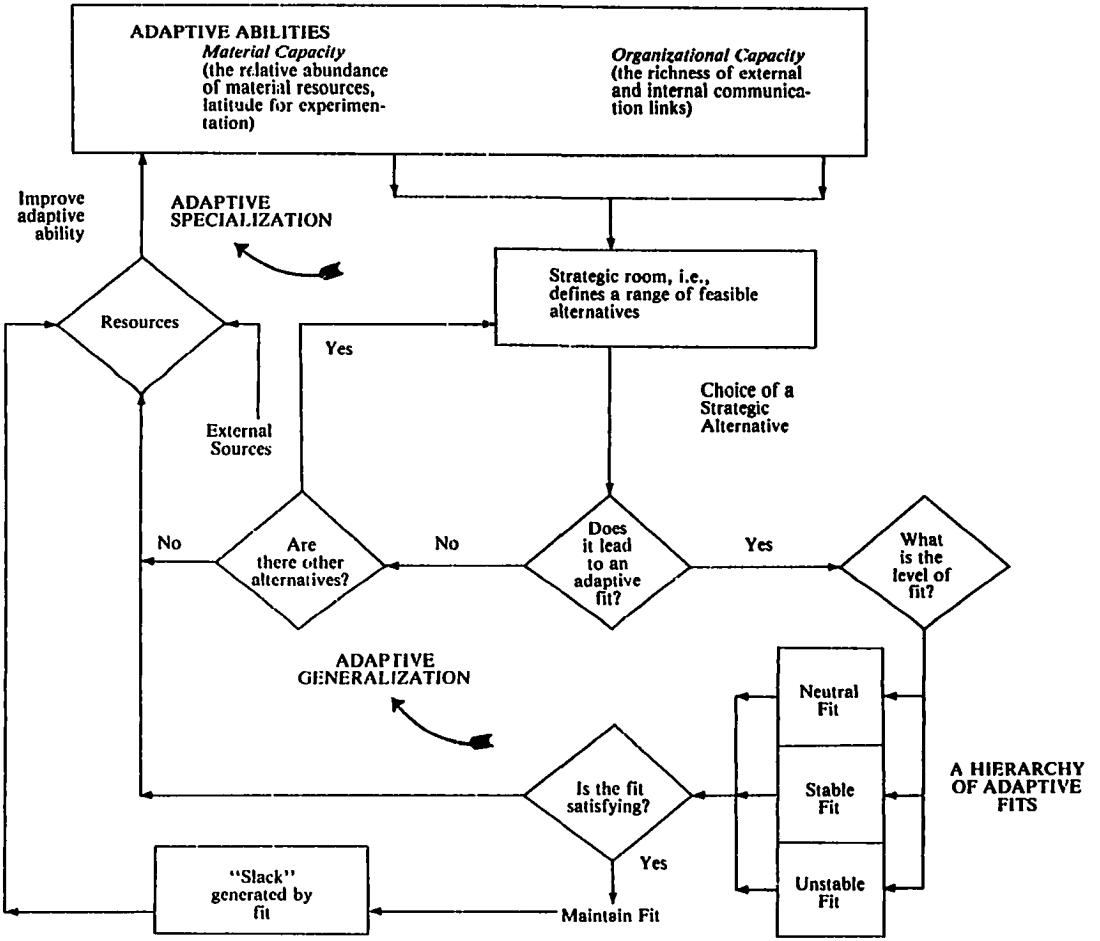
This requires:

1. Managing the process of investing slack. Slack can be invested in improving both the material capacity and the organizational capacity of the firm.
2. Ensuring that in the process of improving material and/or organizational capacity, the efficiency and effectiveness of the firm are always kept within survival limits.

Once the firm acquires a higher adaptive ability, adaptive specialization once again is needed to improve the goodness of its adaptive fit. A general manager can shape the evolution of the firm by careful control over adaptive generalization and adaptive specialization.

The chicken and egg question of whether strategy leads structure or structure leads strategy is resolved by the framework proposed here. The framework suggests that both notions are correct, but they refer to different aspects of a firm's adaptation. Adaptive specialization involves formulation of a strategy in keeping with the firm's resources. Such a strategy must be *followed* by an appropriate structure for successful implementation. However, in the process of adaptive generalization the general manager concentrates on improving the material and organizational capacities of the firm, redesigning the structure where necessary to improve the firm's organizational capacity. It is through adaptive generalization that a firm can consider new strategies for coping with more environmental com-

Figure 3
A Comprehensive Framework for Strategic Management



plexity. In that sense it is structure that *leads* strategy.

The framework also addresses another debate. Contingency theorists—for example, Lawrence and Lorsch (1967) and Burns and Stalker (1961)—have been criticized for their prescription of the best single organizational arrangement to fit a given industry environment (Christenson, 1973). The present framework allows for three distinct fits within any given industry environment. Furthermore, by arranging these fits in a hierarchy, two distinct managerial processes are identified:

1. Managing for fits within a given state of adaptation, that is, adaptive specialization.
2. Managing misfits so as to move the firm to a higher state of adaptation, that is, adaptive generalization.

The descriptive power of the framework has been demonstrated in the coal industry (Chakravarthy, 1981). Parts of the framework also are supported by other recent industry studies (Miles & Snow, 1978; Miles & Cameron, 1977). Although by no means definitive, the framework provides a useful conceptualization of strategic management.

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Balaji S. Chakravarthy is Associate Professor of Management at The Wharton School, University of Pennsylvania.