
1-1-1985

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THE STRATEGY-STRUCTURE LINKAGE:
CONCEPTUAL, METHODOLOGICAL AND MEASUREMENT ISSUES

Working Paper 85-116*

by

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Abstract

The purpose of this paper is to present an information based view of the strategy/structure linkage. The paper seeks to compliment previous work on the topic by positing that information and structure are two sides of the same coin. It further argues that the structural complexity of the form or shape of the structure must accommodate the required complexity of strategic information. Strategic information, the very life-blood of firms, is generated by the strategy program of the firm or business unit. A way to operationalize and measure strategy and structure in this mode is presented. Finally, this rather mechanistic analysis is embedded in a political/incremental process model of matching environment and strategy to structure.

The Strategy-Structure Linkage:

Conceptual, Methodological and Measurement Issues

This note will delve into one way to conceive the strategy-structure linkage. In the development of the topic, certain conceptual, methodological and measurement concerns will be broached. This note attempts to complement the rich case oriented work of Chandler (1962) and Bartlett (1979, 1982), the descriptive work and review of Galbraith and Nathanson (1978), the empirical work of Armour and Teece (1979), and Child (1972, 1974, 1975, 1978) and the conceptual work of Williamson (1975, 1981) and Ouchi (1984).

The Strategy-Structure Imperative

The above works, while tremendously powerful in terms of their own objectives and purposes, do not:

1. Posit an underlying causal mechanism that substantively links strategy and structure. Most of the attempts to offer hypotheses refer to the structure/performance linkage, and not the strategy/structure linkage. Chandler (1962) descriptively discusses the linkage through examples and Armour and Teece (1979) and Child (1974, 1975) offer correlational analysis. However, none of these authors supply a theory of why the linkage between strategy and structure should be an imperative. Also, the absence of a persuasive theory does not tell us a priori what the correlations between strategy and structure should look like. Chandler (1962), Armour and Teece (1979) and Williamson (1975) suggest that M-Form firms will out perform others because of synergy or the fact that the planning and decision making processes in such firms allow them to notice and invest in higher returning projects. These findings with respect to structure/performance only implicitly discuss the strategy/structure linkage.
2. Give us, given a theoretical ground, a way to operationalize both strategy and structure together so that definitive tests of the theory can be made. Galbraith and Nathanson (1978:138-143) do give a schematic treatment of a type of linkage however.

This author is not being critical of the works cited above. The omissions suggested here were simply not part of the objectives of the cited papers.

This note attempts to advance one theory of the strategy-structure linkage that is complimentary to the works cited above and propose a method to measure both strategy and structure so that the theory can be confirmed or refuted. The development of the paper supports the recent position that information, properly conceived and managed, represents sources of competitive advantage for firms.

A Theory of the Strategy-Structure Linkage

As stated above, we need to make:

1. A theoretical statement of why there is or should be an imperative linkage between strategy and structure. The term imperative is taken from the review of Jackson and Morgan (1982) of the organization theory literature. They review the various schools of thought which propose certain imperative linkages of the constructs of technology, size, and environment with the construct of structure. The linkage between strategy and structure is the least developed in the organization theory literature (Child, 1978).
2. Given a theoretical underpinning, a position needs to be made on how both the constructs of strategy and structure together can be operationalized so that a "grounded" measure can be constructed. We normally use the term "grounded" to refer to theories. I would like to propose that we use the concept and term at the measurement stage also. This could mitigate the problem of researchers having to use less than desired measures of the underlying constructs that they have labored to theorize.

A. One Theory of the Strategy-Structure Linkage

We can classically present the theory used in this article with the help of the following scheme:

- Premises
- Causal Laws
- Initial Conditions

Therefore: Conclusions

1. **Premise:** The structure of the organization must accommodate the requisite complexity of the information quantity, flow and sharing suggested by the strategy program and thrust.
2. **Causal Law:** As is common knowledge, it is very risky to posit causal laws in the social sciences. However, we can proceed in a hypothetical mode. A fundamental causal law that threads through the strategy-structure linkage is the notion that the strategy program and thrust of the firm is the cause of the quantity and flow and thereby complexity of key information that is the very life blood of firms. The structure of the organization is the primary and natural receptacle of the information complexity. This natural "mating" is hypothesized to be an organizational imperative. The more quantity of information and its reciprocal sharing caused by more complex and turbulent environments and more complex strategies, the more "complex" the structure should be. This will be recognized as simply another form of the law of requisite variety. However, if we view this assertion in terms the complexity of the structural components sharing information, then this author hopes to demonstrate a different view of the strategy-structure linkage. Again, this view is complementary and not rival to the works cited above.
3. **Initial Conditions:** Given a level of environmental and strategic complexity, there will be a feasible range (set) of information complexity that is appropriate. This appropriate range of information complexity can be approximately measured. A feasible set of appropriate structural complexity can be measured approximately also. The two constructs -- structure and information -- are really two sides of the same coin according to this view.
4. **Conclusion:** The requisite complexity and shape of the macro structure will be partially determined by the causal law and initial conditions. As can be seen, these configurations will vary depending on the situation at hand. Figure 1 shows these ideas in schematic form.

B. Fleshing Out the Strategy-Structure Linkage

It will be useful to provide more detail of how this view of the strategy-structure linkage would be conceptualized and operationalized. A following section will attempt to embed this rather mechanical analysis into a model of Environment-Strategy-Structure that is politically and dynamically oriented.

In the development of this view, it will be paramount to build indicators or attributes of the strategic complexity of the structure. These attributes, when measured and summed up, can give us an interval level indicator of the structural complexity. It is to be noted that this measure is not the same thing as the shape of the structure. Conceivably, the same level of structural complexity could adhere to various different shapes of the structure. To press the argument further, a functional type of shape could be as "complex" as a matrix shape, depending on the level of the four attributes discussed below. The cumulative evidence of the literature suggests the following could, if properly operationalized, measure the inherent structural complexity present or required:

1. The Specific Diversity of the Structure

Following Pielou (1966), Bigler (1982), Donaldson and Lorsch (1983) and Palepu (1985) we can use the construct behind the Shannon-Weaver formula for specific diversity to suggest the specific diversity of the structure. This formula:

$$\text{Specific Diversity} = - \sum_{i=1}^N P_i (\text{Log } P_i) \text{ where } P_i = \text{proportion}$$

of a "species" present in 1 ... N categories shows that as there are more categories represented and as the proportion of a population is more evenly spread among the categories, the more diverse the population will be. The formula then measures both the number of categories present and the evenness of distribution among the categories. For our purposes the specific diversity of a structure can be measured by the number of strategic building blocks in the structure (building blocks being departments, SBUs, groups, sectors, etc.) and the evenness of the communication and information that is initiated, received and feedback among the building blocks.

2. The Shape of the Structure

This attribute can be represented by how flat or tall the structure is. This is the traditional way of measuring such things as degree of bureaucracy, degree of centralization or autonomy. However, the flatness or tallness of the structure, measured by the number of levels, or its very shape and architecture might be able to tell us something about the number of elements in the structure that initiate and receive strategic information and the evenness of the transmission among them.

3. Absolute Quantity of Information Sent, Received, Processed and Feedback

This attribute requires little explanation. It is simply an attempt to measure the total quantity of strategic information that is "handled" and processed to some degree.

4. The Time Span of Feedback of Information

Following Lawrence and Lorsch (1967), this attribute is the time it takes for a bit of information to be sent (initiated) and feedback to some appropriate "home."

These four attributes could, if properly operationalized, describe the strategic complexity of the structure. Before I offer some hypotheses concerning the above attributes, perhaps some definitions would be in order. With regard to information, a strategic component or building block (SBU, group, sector, etc.) can:

1. Initiate (transmit) Only: It can transmit information up, down or laterally.
2. Receive Only.
3. Initiate and Receive (this unit is the proactive initiator).
4. Receive and Transmit (this unit reacts to an initiator).

Given these observations, the following hypotheses can be advanced:

- H₁: The more information that is initiated, transmitted, received and processed the more complex the structure is.
- H₂: The more the absolute quantity of information that is initiated, transmitted, received and processed the more complex the structure is. The reason for the distinction between H₁ and H₂ is that in H₁ a given bit of strategic information can, perhaps because of its political content, pass through a "cycle" of information several times before coming to rest. H₂ represents more actual distinct bits of information that are passed through the system.
- H₃: The shorter the time span of feedback for strategic information, the more complex or diverse the structure is. In order to correct for the number of levels in the firm, a ratio of time span of feedback divided by the number of levels could be used. So, given two firms with a varying number of levels, the one with the smallest ratio of time span to number of levels would have a more complex structure than the one with the larger ratio.

If the structure can accommodate all of these occurrences with little friction, then the structure is deemed to be "fluid." It is the fluidity of the structure and not just its shape that determines how flexible and adaptive the firm can be.

Some interesting observations come to mind when one views the complexity of the structure in this manner. For example, it is not just the number of layers in an organization that determines the complexity of the structure. A relatively bureaucratic firm (one that is held to have too many layers) can actually have a less complex structure than one with say only two layers. The complexity of the structure at Apple Computer then could be much more complex (by our measure of structural complexity) than say Burroughs or Xerox. There is simply a blur of information that is processed in a very fluid manner. This is not to say that a large firm with many layers cannot have the requisite strategic complexity and fluidity of its structure. A firm like IBM is a perfect case in point. An interesting derivative question would be what are the exogenous and endogenous factors that allow IBM to enjoy all of the fruits of being a large company.

If the requisite complexity of the structure is crafted properly, the following positive attributes of the structure should surface. It is these positive attributes that make for fluid structures. The structure should be:

1. Flexible: This is where one of the building blocks of the structure can be changed or one can be added, and there will not be an appreciable decrease in the optimal level of complexity and fluidity. In other words, the morphos or form of the organization is malleable.
2. Adaptive: This is where a building block, possibly after having shown a degree of necessary flexibility when a change was called for either:
 - a. Learns: the unit acts on "new" information and either stores it and or passes it on to a higher or lower unit.

- b. **Develops:** the unit uses the "new" information to enhance or change its form.
- 3. **Practical:** For any required task imposed on the structure by the environment and strategy, the least diverse or complex of a feasible set of possibilities should be chosen. Simply stated, this means that the most cost effective level of structural complexity should be chosen.
- 4. **Legitimate:** The structural change or program must respect the very subtle power bases that have been formed in the organization. Many failed structural programs have been caused by change programs that have too hastily unearthed power bases that have taken years to form.

The above analysis has attempted to describe one view of the strategy/structure linkage. The tone of the exegesis so far has been rather mechanical and may have suggested a rather deterministic view of the linkage. The next section will attempt to imbed this mechanistic analysis into the context of a model of the strategy/structure linkage that suggests the process is political, incremental and one that is perhaps more art than science.

C. A Process/Political Model of the Strategy/Structure Linkage

Figure 2 shows one model of the strategy/structural change process. It attempts to be purely strategic in its orientation and attempts to underscore the imperative relationship between strategy and structure. Components 1 through 6 suggest that the imperative linkage is best viewed as a dynamic system. Changing environments will at some point cause certain "key success factors" to become more or less salient (see Bigler: 1983,1985 for a fuller explication). This dynamic process could be gradual or could be catastrophic. Regardless of the rapidity of the environmental change, this may suggest a change in the strategy program of the firm. As Porter (1985) and Bigler (1985) have argued, this will likely suggest that new functional areas (marketing, production, etc.) and value chain components (see Porter, 1985) will emerge as crucial players in the firm's quest for comparative advantage. The

cumulative effect through the model to this point may necessitate a change in the feasible set of criteria for the strategic building blocks of the structure. General Electric's criteria for a structural component (department, group, sector) to be a strategic business unit (SBU) are fairly well documented there. These criteria:

1. Component must have a unique business mission independent of the mission of any other component.
2. The component must have a clearly defined set of competitors.
3. The component must be a full-fledged competitor in external markets (as opposed to a dominant role as an internal supplier).
4. The component must have the ability to accomplish integrated strategic planning with respect to products, markets, facilities and organization relatively independently of other SBUs.
5. The component manager must be able to "call the shots" in areas crucial to the success of the business -- e.g., technology, manufacturing, marketing and cash management.

may need to be changed, however, as influenced by the first four components in Figure 2. General Foods SBU criteria:

1. Inventory the products offered by the corporation to identify specific products, product lines, and mixes of product lines. Determine the end user needs that each product is intended to satisfy.
2. Identify which products satisfy similar needs (e.g., foods for main meals). Also determine which products satisfy the needs of more than one user group.
3. Form units composed of one or more products or product lines that satisfy similar needs (e.g., food preparation appliances). The products that form a planning unit should have major strategic features in common, such as distribution channels, market target, technology, and/or advertising and sales force strategies.
4. Determine if there are management, market, operating, or other advantages to combining two or more planning units into a division, group, or business segment.
5. Review the proposed scheme to determine if it offers both operational and strategic advantages. Do the potential benefits of the scheme exceed the costs?

while useful and practical for their current situation, could also be forced to be changed by changes in the first four panels of Figure 2.

These occurrences in turn allows certain of the strategic "building blocks" of the organization to become more visible. This new found visibility, which may re-establish old building blocks or adhere to previously less visible building blocks, will help to either solidify old power bases, or cause the formation of new power bases. Hickson, et.al., (1971) and March (1962), have reported on the essential information basis for power coalitions in firms. As the next panel in the model shows, the cumulative effect of one cycle of this process/ political model will suggest a likely major configuration of the building blocks in the "macro" structure of the firm. This configuration will be either a functional, divisional, matrix or some hybrid of these. As has been hypothesized in the previous sections of the paper, the last portion of the model suggests that this major structural configuration needs to maximize:

- ° Flexibility
- ° Adaptiveness
- ° Legitimacy

Subject to:

- ° The minimum level of structural complexity:
 - ° Specific Diversity of the Structure
 - ° The Shape of the Structure
 - ° The Absolute Quantity of Information Sent, Received, Processed and Feedback
 - ° The Time Span of Feedback of Information

As was stated above, this minimum level gives practical structures. If all of the preceding is architected usefully, then fluidity of structure should result.

Although Bartlett (1979, 1982) has described structural change in organizations as evolutionary as opposed to revolutionary, one can observe in Figure

2 that this is an inherently dynamic process. Potential forces for change exist almost anywhere in the model.

Conclusion

This paper has tried to present a complementary view of the strategy/structure linkage and process. It has attempted to advance an underlying causal mechanism that bridges the linkage, that of the imperative requirement that the structure accommodate the requisite information "thrown off" from the strategy program. It has attempted to operationalize some attributes of the requisite structural complexity. The paper has tried to embed the causal mechanism and attributes in a political/ process model of strategy/structure transformation. Finally, the paper has suggested some desirable strategic outcomes: flexibility, adaptiveness, practicality and legitimacy. This one complementary view hopefully has filled a gap in the literature by suggesting an operationally oriented view of the strategy/structure linkage and process that should aid managers diagnose and prescribe.

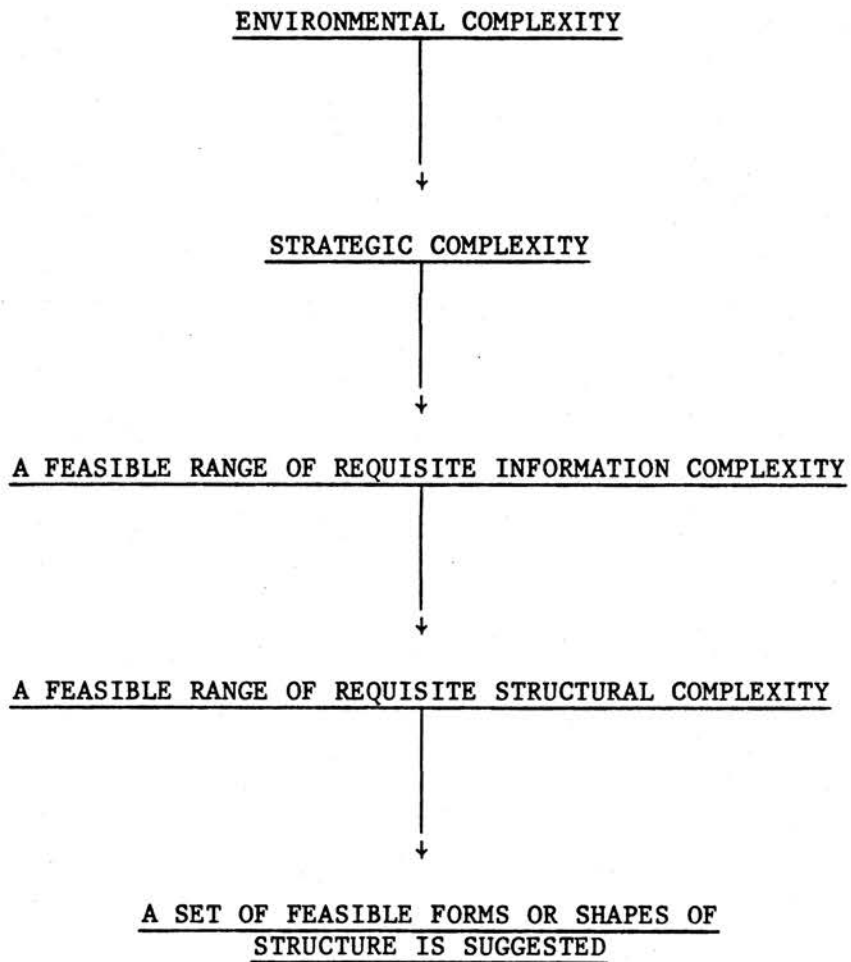
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Figure 1

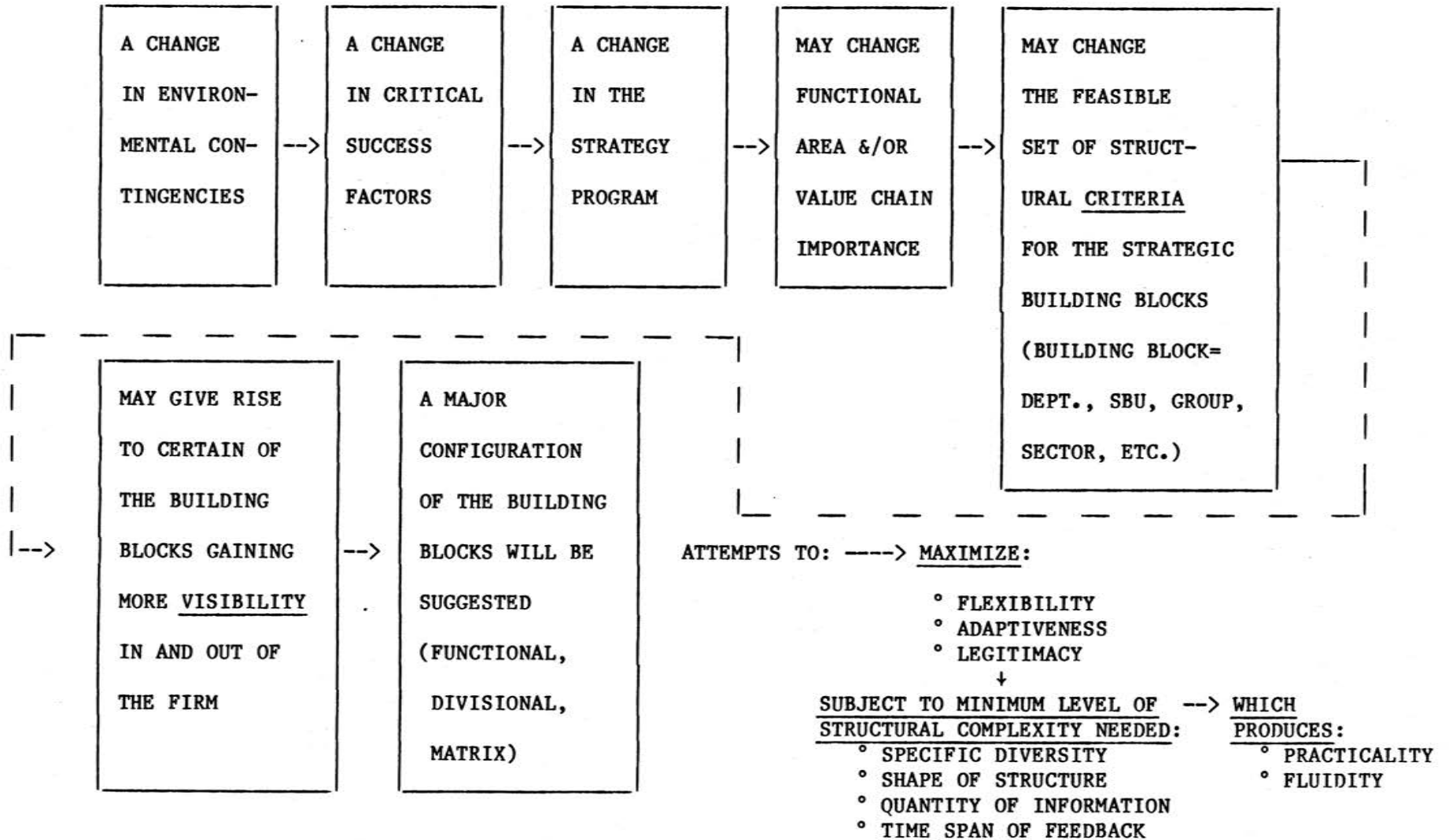
CAUSAL LINKAGES IN AN INFORMATION BASED VIEW OF THE
STRATEGY/STRUCTURE LINKAGE



Source: Primary

Figure 2

A PROCESS/POLITICAL MODEL OF THE STRATEGY/STRUCTURE LINKAGE



Source: Primary

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