MANAGEMENT SCIENCE
Vol. 26, No. 3, March 1980
Printed in U.S.A.

STRUCTURE IN 5'S: A SYNTHESIS OF THE RESEARCH ON ORGANIZATION DESIGN*

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The elements of organizational structuring—which show a curious tendency to appear in five's—suggest a typology of five basic configurations: Simple Structure, Machine Bureaucracy, Professional Bureaucracy, Divisionalized Form, and Adhocracy.

The elements include (1) five basic parts of the organization—the operating core, strategic apex, middle line, technostructure, and support staff; (2) five basic mechanisms of coordination—mutual adjustment, direct supervision, and the standardization of work processes, outputs, and skills; (3) the design parameters—job specialization, behavior formalization, training and indoctrination, unit grouping, unit size, action planning and performance control systems, liaison devices (such as integrating managers, teams, task forces, and matrix structure), vertical decentralization (delegation to line managers), and horizontal decentralization (power sharing by nonmanagers); and (4) the contingency factors—age and size, technical system, environment, and power.

Each of the five configurations relies on one of the five coordinating mechanism and tends to favor one of the five parts. In Simple Structure, the key part is the strategic apex, which coordinates by direct supervision; the structure is minimally elaborated and highly centralized; it is associated with simple, dynamic environments and strong leaders, and tends to be found in smaller, younger organizations or those facing severe crises. The Machine Bureaucracy coordinates primarily by the imposition of work standards from the technostructure; jobs are highly specialized and formalized, units functional and very large (at the operating level), power centralized vertically at the strategic apex with limited horizontal decentralization to the technostructure; this structure tends to be found in simple, stable environments, and is often associated with older, larger organizations, sometimes externally controlled, and mass production technical systems. The Professional Bureaucracy relies on the standardization of skills in its operating core for coordination; jobs are highly specialized but minimally formalized, training is extensive and grouping is on a concurrent functional and market basis, with large sized operating units, and decentralization is extensive in both the vertical and horizontal dimensions; this structure is typically found in complex but stable environments, with technical systems that are simple and non-regulating. In the Divisionalized Form, a good deal of power is delegated to market-based units in the middle line (limited vertical decentralization), whose efforts are coordinated by the standardization of outputs, through the extensive use of performance control systems; such structures are typically found in very large, mature organizations, above all operating in diversified markets. Adhocracy coordinates primarily by mutual adjustment among all of its parts, calling especially for the collaboration of its support staff; jobs are specialized, involving extensive training but little formalization, units are small and combine functional and market bases in matrix structures, liaison devices are used extensively, and the structure is decentralized selectively in both the vertical and horizontal dimensions; these structures are found in complex, dynamic environments, and are often associated with highly sophisticated and automated technical systems.

In conclusion, it is claimed that the effective Organization will favor some sort of configuration—some type of a logically consistent clustering of its elements—as it searches for harmony in its internal processes and consonance with its environment. But some organizations will inevitably be driven to hybrid structures as they react to contradictory pressures or while they effect a transition from one configuration to another, and here too it is believed that the typology of five can serve as a diagnostic tool in organizational design.

(ORGANIZATION DESIGN; ORGANIZATION STRUCTURES)

*Accepted by Arie Y. Lewin; received May 16, 1979. This paper has been with the author 3 months for 1 revision.

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* The *support staff* includes those groups that provide indirect support to the rest of the organization (e.g., in the typical manufacturing firm, legal counsel, public relations, payroll, cafeteria).

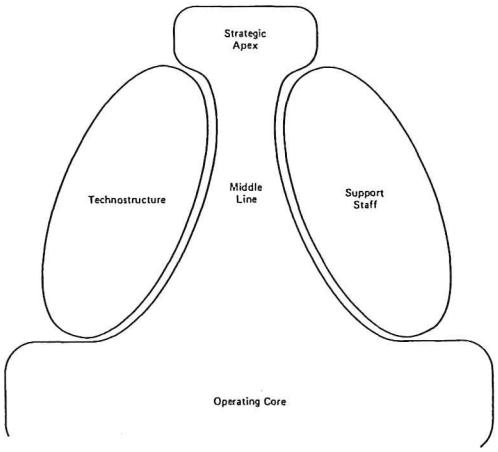

FIGURE 1. The Five Basic Parts of the Organization.

Two points should be noted about this view of the organization. First, a distinction is maintained between "line" and "staff". This is not meant to ignore the criticisms of this classical notion, but simply to allow for the validity of the distinction in certain kinds of structures. And second, two kinds of staff are in fact distinguished, only one of which—the techno-structure—"advises" in the usual sense identified with staff. The support staff may advise, but its prime role is to provide special services to the organization. This part is seldom distinguished in the literature, despite the fact that a glance at the "organigram" (organizational chart) of most large organizations shows it to be an important component in sheer numbers alone.

The Coordinating Mechanisms

Organizational structuring, of course, focuses on the division of labor of an organizational mission into a number of distinct tasks, and then the coordination of all of these tasks to accomplish that mission in a unified way. The literature suggests that this coordination can be effected in at least five basic ways:

* In *direct supervision*, one individual (typically a manager) gives specific orders to others and thereby coordinates their work.

* In the *standardization of work processes*, the work is coordinated by the imposition (typically by analysts of the technostructure) of standards to guide the doing of the work itself—work orders, rules and regulations, etc.

* In the *standardization of outputs*, the work is coordinated by the imposition (again, often by the analysts of the technostructure) of standard performance measures or specifications concerning the outputs of the work.

* In the *standardization of skills*, the work is coordinated by the internalization by individuals of standard skills and knowledge, usually before they begin to do the work.

* And in *mutual adjustment*, individuals coordinate their own work, by communicating informally with each other.

fact measurement of performance of all the decisions or actions of a given position or unit over a given period of time, for example, of the sales growth of a division in the first quarter of the year.

* The *liaison devices* are the means by which the organization encourages mutual adjustment across units. As Galbraith [23] has shown, these can be placed along a rough continuum of increasing elaboration and formality, from liaison positions and then task forces and standing committees, which establish informational connections across units, through integrating managers who are given some (limited) measure of formal authority over the decisions of the units they connect, to fully developed matrix structures which sacrifice the classical principle of unity of command in favor of the joint responsibility of two or more managers or units over the making of certain decisions.

Finally, there are the parameters associated with the design of the decision making system, generally referred to as ones of *decentralization* (which we define as the extent to which power over decision making in the organization is dispersed among its members). We find it convenient to divide these into two groups:

* *Vertical decentralization* refers to the extent to which formal decision making power is "delegated" down to the chain of line authority.

* *Horizontal decentralization* refers to the extent to which power flows informally outside this chain of line authority (that is, to analysts, support staffers, and operators in the operating core).[2] Combining these two design parameters with two other types

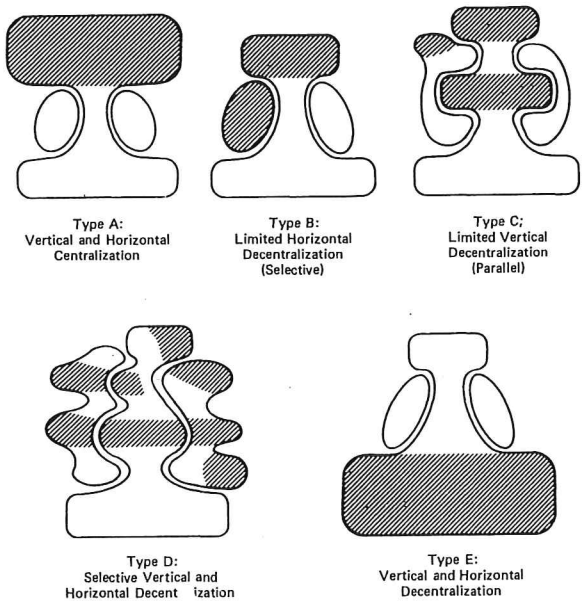

FIGURE 2. The Five Types of Decentralization.

[2] A third use of the term decentralization relates to the physical dispersal of services. Since this has nothing to do with the dispersal of decision making power per se, it is not considered here to be a type of decentralization. The term "concentration" is used instead, and is associated with unit grouping (i.e., the determination of where the support units are grouped).

Burns and Stalker [5]; Burns [4]; Harvey [27]; Lawrence and Lorsch [41]), and complex environments with decentralized ones (Hage and Aiken [25]; Pennings [43][3]). However, laboratory evidence suggests that hostile environments might lead organizations to centralize their structures temporarily (Hamblin [26]). And disparities in the environment appear to encourage selective decentralization to differentiated work constellations (Hlavacek and Thompson [31]; Khandwalla [36]; Lawrence and Lorsch [41]). Finally, there is a good deal of evidence that diversification of the organization's markets encourage the use of market bases for grouping at high levels, assuming favorable economies of scale (Chandler [6]; Wrigley [68]; Rumelt [53]; Channon [8]; Dyas and Thanheiser [18]).

* *Power* factors have also been shown to have selective effects on structure. Most importantly, external control of organizations appears to increase formalization and centralization (Samuel and Mannheim [54]; Heydebrand [28]; Holdaway et al. [32]; Pugh et al. [50]; Reimann [51]; Pondy [47]). The need for power of the various members can influence the distribution of decision making authority, especially in the case of a chief executive whose strong need for power tends to increase centralization (Dill [16]). And fashion has been shown to have an influence on structure, sometimes driving organizations to favor inappropriate though fashionable structures (Woodward [67]; Lawrence and Lorsch [41]; Rumelt [53]; Franko [22]; Child and Keiser [10]; Azuni and McMillan [1]).

3. The Configurations of Structure

The congruence hypothesis related organizational effectiveness to the fit between a given design parameter and a given contingency factor. But a second hypothesis is also possible—what can be called the *configuration* hypothesis—that effective structuring requires an internal consistency among the design parameters. In fact, Khandwalla [35] supports this in his research with the finding that while no single structural variable correlated significantly with performance, when he split his sample of firms into high and low performers, eleven relationships between various structural variables held only for the high performers, eight for both groups, and only two for the low performers alone.

In fact, we can combine our two hypotheses to propose a third, combined one, that we can call the *extended configuration* hypothesis: effective structuring requires a consistency among the design parameters and the contingency factors. In other words, we can search for natural clusters or configurations of the design parameters together with the contingency factors. Implicit in this hypothesis is the notion that the two sets of factors merge into interactive systems, that the design parameters "cause" the so-called contingency factors just as much as the contingency factors influence the choice of design parameters. An organization may become more bureaucratic as it grows, but bureaucracies also have a habit of trying to grow larger; dynamic environments may call for organic structures, but organizations with organic structures also seek out dynamic environments, where they can outmaneuver the bureaucracies. Our

[3]Pennings found few correlations between the environmental variables and the design parameters he measured in his study of stock brokerage offices. One important exception was complexity, which showed some significant correlations with measures that amount to decentralization. But because Pennings made no conceptual distinction between his environmental variables—he viewed them all as "characterized by uncertainty" (p. 394)—instead of concluding support for this hypothesis, he instead rejected the congruency assumption altogether.

These five configurations consititute a typology of "ideal" or "pure" types. The central purpose of this article is to present this typology, and in so doing to make the case that it brings together the various elements of structuring discussed in the

TABLE 1

Elements of the Five Structural Configurations

	Simple Structure	Machine Bureaucracy	Professional Bureaucracy	Divisionalized Form	Adhocracy
Key coordinating mechanism:	Direct Supervision	Standardization of work	Standardization of skills	Standardization of outputs	Mutual Adjustment
Design parameters:					
Specialization of jobs:					
–horizontal	low	high	high	some (between HQ	high
–vertical	high	high	low	some and divisions)	low
Training	low	low	high	some (for division	high
Indoctrination	low	low	high (retraining)	some managers)	varies
Formalization of behavior	low	high	low	high (within divisions)	low
Bureaucratic/ organic	organic	bureaucratic	bureaucratic	bureaucratic	organic
Grouping	usually functional	usually functional	functional and market	market	functional and market
Unit Size	large	large (at bottom, narrow elsewhere)	large (at bottom, narrow elsewhere)	large (between HQ and divisions)	small (throughout)
Planning and control systems	little	action planning	little	perf. control	limited action pl. (esp. in Adm. Ad.)
Liaison devices	few	few	some in administration	few	many throughout
Decentralization	centralization	limited horizontal decentralization	horizontal and vertical decentral-ization	limited vertical decentralization	selective decentralization
Contingency factors:					
Age (typically)	young	old	varies	old	young (Op. Ad.)
Size (typically)	small	large	varies	very large	varies
Technical system					
–regulation	low	high	low	high	low
–complexity	low	low	low	low	low/high (Op./Adm.Ad.)
–automated	no	no	no	no	no/often (Op./Adm.Ad.)
Environment					
–complexity	low	low	high	low	high
–dynamism	high (sometimes hostile)	low	low	low (diversified markets)	high (sometimes disparate)
Power					
–focus	strategic apex	technostructure, often external	professional operators	middle line	experts
–fashionable	no	no	yes	yes	especially

organizations and small organizations also tend to use the Simple Structure, because they have not yet had the time, or yet reached the scale of operations, required for bureaucratization. Finally extreme hostility in their environments force most organizations to use the Simple Structure, no matter how they are normally organized. To deal with crises, organizations tend to centralize at the top temporarily, and to suspend their standard operating procedures.

The classic case of the Simple Structure is, of course, the entrepreneurial firm. The firm is aggressive and often innovative, continually searching for risky environments where the bureaucracies hesitate to operate. But it is also careful to remain in a market niche that its entrepreneur can fully comprehend. Entrepreneurial firms are usually small, so that they can remain organic and their entrepreneurs can retain tight control. Also they are often young, in part because the attrition rate among entrepreneurial firms is so high, and in part because those that survive tend to make the transition to bureaucracy as they age. Inside the structure, all revolves around the entrepreneur. Its goals are his goals, its strategy his vision of its place in the world. Most entrepreneurs loathe bureaucratic procedures as impositions on their flexibility. Their unpredictable maneuvering keeps their structures lean, flexible, organic.

Khandwalla [38] found this structural form in his research on Canadian companies. Pugh et al. [49] also allude to this form in what they call "implicity structured organizations", while Woodward [67] describes such a structure among the smaller unit production and single purpose process firms.

The Machine Bureaucracy

A second clear configuration of the design parameters has held up consistently in the research: highly specialized, routine operating tasks, very formalized procedures and large-sized units in the operating core, reliance on the functional basis for grouping tasks throughout the structure, little use made of training and of the liaison devices, relatively centralized power for decision making with some use of action planning systems, and an elaborate administrative structure with a sharp distinction between line and staff. This is the structure Woodward [67] found in the mass production firms, Burns and Stalker [5] in the textile industry, Crozier [13] in the tobacco monopoly, Lawrence and Lorsch [41] in the container firm; it is the structure the Aston group (Pugh et al., [49]) referred to as "workflow bureaucracy".

Despite its sharp distinction between line and staff, because the machine bureaucracy depends above all on standardization of work processes for coordination, the technostructure—which houses the many analysts who do the standardizing—emerges as the key part of the structure. Consequently, these analysts develop some informal power, with the result that the organization can be described as having limited horizontal decentralization. The analysts gain their power largely at the expense of the operators, whose work they formalize to a high degree, and of the first-line managers, who would otherwise supervise the operators directly. But the emphasis on standardization extends well above the operating core, and with it follows the analysts' influence. Rules and regulations—an obsession with control—permeate the entire structure; formal communication is favored at all levels; decision making tends to follow the formal chain of authority. Only at the strategic apex are the different functional responsibilities brought together; therefore, only at that level can the major decisions be made, hence the centralization of the structure in the vertical dimension.

work relatively freely not only of the administrative hierarchy but also of their own colleagues. Much of the necessary coordination is achieved by design—by the standard skills that predetermine behavior. And this autonomy in the operating core means that the operating units are typically very large, as shown in Figure 5, and that the structure is decentralized in both the vertical and horizontal dimensions. In other words, much of the formal and informal power of the Professional Bureaucracy rests in its operating core, clearly its key part. Not only do the professionals control their own work, but they also tend to maintain collective control of the administrative apparatus of the organization. Managers of the middle line, in order to have power in the Professional Bureaucracy, must be professionals themselves, and must maintain the support of the professional operators. Moreover, they typically share the administrative tasks with the operating professionals. At the administrative level, however, in contrast with the operating level, tasks require a good deal of mutual adjustment, achieved in large part through standing committees, task forces, and other liaison devices.

The technostructure is minimal in this configuration, because the complex work of the operating professionals cannot easily be formalized, or its outputs standardized by action planning and performance control systems. The support staff is, however, highly elaborated, as shown in Figure 5, but largely to carry out the simpler, more routine work and to back-up the high-priced professionals in general. As a result, the support staff tend to work in a machine bureaucratic pocket off to one side of the Professional Bureaucracy. For the support staff of these organizations, there is no democracy, only the oligarchy of the professionals. Finally, a curious feature of this configuration is that it uses the functional and market bases for grouping concurrently in its operating core. That is, clients are categorized and served in terms of functional specialties—chemistry students by the chemistry department in the university, cardiac patients by the cardiac department in the hospital.[6]

The Professional Bureaucracy typically appears in conjunction with an environment that is both complex and stable. Complexity demands the use of skills and knowledge that can be learned only in extensive training programs, while stability ensures that these skills settle down to become the standard operating procedures of the organization. Age and size are not important factors in this configuration: the organization tends to use the same standard skills no matter how small or young it is because its professionals bring these skills with them when they first join the organization. So unlike the Machine Bureaucracy, which must design its own standards, in the Profes-

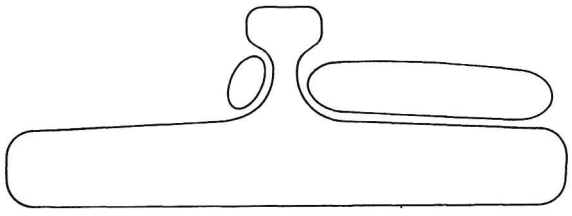

FIGURE 5. The Professional Bureaucracy.

[6]It is interesting to note that in Simon's [57, p. 30] criticism in *Administrative Behavior* of the ambiguities in the classical distinction between grouping by process and by purpose, all of his examples are drawn from professional work.

mance standards, the existence of which depend on two major assumptions. First, each division must be treated as a single integrated system with a single, consistent set of goals. In other words, while the divisions may be loosely coupled with each other, the assumption is that each is tightly coupled within. Second, those goals must be operational ones, in other words, lend themselves to quantitative measures of performance control. And these two assumptions hold only in one configuration, the one that is both bureaucratic (i.e., operates in a stable enough environment to be able to establish performance standards) and integrated, in other words, in Machine Bureaucracy. Moreover, as noted earlier, external control drives organizations toward Machine Bureaucracy; here the headquarters constitutes external control of the divisions.

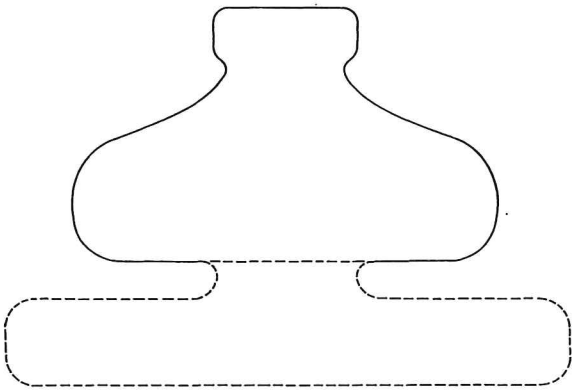

FIGURE 7. The Adhocracy.

One factor above all encourages the use of the Divisionalized Form—market diversity, specifically, that of products and services. (Diversity only in region or client leads, as Channon [9] has shown, to an incomplete form of divisionalization, with certain "critical" functions concentrated at headquarters, as in the case of purchasing in a regionally diversified retailing chain.) But by the same token, it has also been found that divisionalization encourages further diversification (Rumelt [53, pp. 76–77]; Fouraker and Stopford [21]), headquarters being encouraged to do so by the ease with which it can add divisions and by the pressures from the corps of aggressive general managers trained in the middle lines of such structures. Otherwise, as befits a structure that houses Machine Bureaucracies, the Divisionalized Form shares many of their conditions—an environment that is neither very complex nor very dynamic, and an organization that is typically large and mature. In effect, the Divisionalized Form is the common structural response to an integrated Machine Bureaucracy that has diversified its product or service lines horizontally (i.e., in conglomerate fashion).

The Divisionalized Form is very fashionable in industry, found in pure or partial form among the vast majority of America's largest corporations, the notable exceptions being those with giant economies of scale in their traditional businesses (Wrigley [68]; Rumelt [53]). It is also found outside the sphere of business (in the form of multiverities, conglomerate unions, and government itself), but often in impure form due to the difficulty of developing relevant performance measures.

The Adhocracy

Sophisticated innovation requires a fifth and very different structural configuration, one that is able to fuse experts drawn from different specialties into smoothly

the set of skills it performs best and so converting itself from an Operating Adhocracy into a Professional Bureaucracy. Moreover, because Operating Adhocracies in particular are such vulnerable structures—they can never be sure where their next project will come from—they tend to be very young on average: many of them either die early or else shift to bureaucratic configurations to escape the uncertainty.

Adhocracies of the Administrative kind are also associated with technical systems that are sophisticated and automated. Sophistication requires that power over decisions concerning the technical system be given to specialists in the support staff, thereby creating selective decentralization to a work constellation that makes heavy use of the liaison devices. And automation in the operating core transforms a bureacratic administrative structure into an organic one, because it frees the organization of the need to control operators by technocratic standards. The standards are built right into the machines. In effect, the support staff, being charged with the selection and engineering of the automated equipment, takes over the function of designing the work of the operating core. The result is the Adhocracy configuration.

Finally, fashion is an important factor, because every characteristic of Adhocracy is very much in vogue today—emphasis on expertise, organic and matrix structure, teams and task forces, decentralization without power concentration, sophisticated and automated technical systems, youth, and complex, dynamic environments. In fact, perhaps the best support for Stinchcombe's claim, cited earlier, that structure reflects the age of founding of the industry, comes from the observation that while Adhocracy seems to be used in few industries that were fully developed before World War Two, it is found extensively in virtually every one that developed since that time. Thus, it is described by Lawrence and Lorsch [41] in plastics companies, by Chandler and Sayles [7] in NASA, by Woodward [67] in modern process production, and by Galbraith [23] in the Boeing Company. Adhocracy seems clearly to be the structure of *our* age.

4. Beyond Five

Our five configurations have been referred to repeatedly in this article as ideal or pure types. The question then arises as to where—or whether—they can be found. It is clear that each configuration is a simplification, understating the true complexity of all but the simplest organizational structures. In that sense, every sentence in our description of the configurations has been an overstatement (including this one!). And yet our reading of the research literature suggests that in many cases one of the five pulls discussed earlier dominates the other four in an organization, with the result that its structure is drawn toward one of the configurations. It is presumably its search for harmony in structure and situation that causes an organization to favor one of the pure types.

Other structures of course emerge differently. Some appear to be in transition from one pure type to another, in response to a changed situation. Others exhibit structures that can be described as hybrids of the configurations, perhaps because different forces pull them toward different pure types. The symphony orchestra, for example, seems to use a combination of Simple Structure and Professional Bureaucracy: it hires highly trained musicians and relies largely on their standardized skills to produce its music, yet it also requires a strong, sometimes autocratic, leader to weld them into a tightly coordinated unit. Other hybrids seem to be dysfunctional, as in the case of the organization that no sooner gives its middle managers autonomy subject to performance control, as in the Divisionalized Form, than it takes it away by direct

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