6

FITTING DESIGN TO SITUATION

Given a set of design parameters at the command of the organization designer, how does he select them? How does he decide when to use a market and when a functional basis for grouping in the middle line, when to formalize behavior in the operating core and when to rely on training or the use of the liaison devices to encourage mutual adjustment, when to decentralize horizontally and when vertically?

Most of the contemporary research on organizational structuring has focused on these questions. This research has uncovered a set of what are called *situational* or *contingency factors*, organizational states or conditions that are associated with the use of certain design parameters. In this chapter we discuss these factors in four groups: the *age* and *size* of the organization; the *technical system* it uses in its operating core; various aspects of its *environment*, notably stability, complexity, diversity, and hostility; and certain of its *power* relationships. But before we discuss each, we must first comment on the notion of effectiveness in structural design.

Two Views of Organizational Effectiveness

A number of researchers have studied the relation between structure and performance, typically by comparing the structures of high- and low-performance firms. Their tendency has been to attribute effectiveness to the fit between certain design parameters and some situational factor—for example, the size of the organization, the technical system it uses, or the dynamic nature of its environment. One study, however, carried out by Khandwalla (1971, 1973b, 1974), found that effectiveness was dependent on the interrelationships among design parameters; in other words, on the use of different ones in a consistent or integrated manner.

These studies lead us to two important and distinct conclusions about structural effectiveness. The first we can label the *congruence* hypothesis: **effective structuring requires a close fit between the situational factors and the design parameters.** In other words, the successful organization designs its structure to match its situation. And the second we can call the *configuration* hypothesis: **effective structuring requires an internal consistency among the design parameters.** The successful organization develops a logical configuration of the design parameters.

Do these two hypotheses contradict each other? Not necessarily. Not as long as an organization's major situational factors—for example, its size on the one hand and its technical system on the other—do not call for design parameters that are mutually inconsistent. Where they do, the organization would have to trade off situational fit for consistency in its internal structure. But where they do not, the organization would simply select the structural configuration that best matches its situation. Of course, this situation is not something beyond the organization's control. That is, it can choose not only its design parameters, but certain aspects of its situation as well: it designs its own technical system, decides whether or not to grow large, gravitates to an environment that is stable or dynamic, and so on. Thus the situational factors can be clustered, too. This conclusion enables us to combine the two hypotheses into a single, *extended configuration* hypothesis: **effective structuring requires a consistency among the design parameters and contingency factors.**

Our preference, as has been evident, is for the extended configuration hypothesis. But before we can develop it, we need to consider the congruence hypothesis, because the research has shed a good deal of light on the relations between design and situation. These findings will in fact help us to develop the configurations and enable us to build the situational factors into them.[1]

In discussing these relationships in this chapter, we shall treat the situational factors as *independent* variables (that is, as given) and the design parameters as *dependent* ones (that is, to be determined). These assumptions will, of course, be dropped when we get to the configurations. As we argued earlier, because the configurations are systems, no one of their parts is independent or given; rather, each is integrated with, and hence dependent on, all the others.

In addition, we shall consider a set of *intermediate* variables in this chapter, through which the situational factors affect the design parameters. These concern the work that is done in the organization and include the comprehensibility of the work (which most strongly affects specialization and decentralization); the predictability of the work (which most strongly affects standardization in its three forms, which means the design parameters of behavior formalization, planning and control systems, and training and indoctrination); the diversity of the work (which most strongly affects the choice of bases for grouping units, as well as behavior formalization and the use of liaison devices); and the speed with which the organization must respond to its environment (which most strongly affects decentralization, behavior formalization, and unit grouping).

We discuss age and size, technical system, and environment in two ways in this chapter—in terms of a set of hypotheses, each typically relating to a specific situational factor to one or more design parameters, and in terms of a framework or set of organizational types suggested by this set of hypotheses. (The power factors will be discussed only in terms of the hypotheses.) As we shall see, these types reinforce the findings of the earlier chapters that point the way to our configurations.

[1]As discussed in the "Note to the Reader" at the outset of this book, we shall not discuss the evidence that supports these relationships here, only the findings themselves. The interested reader can turn for this evidence to the companion volume, H. Mintzberg, *The Structuring of Organizations; A Synthesis of the Research* (Englewood Cliffs, N.J.: Prentice-Hall, 1979), notably Chapters 13–16, where the four sets of situational factors are in turn discussed at length, in much the same format as below.

Age and Size

We have a considerable body of evidence on the effects of age and size on structure, most of which we can capture in five hypotheses, two concerning age and three size. After discussing each hypothesis, we shall see that we can clarify and synthesize them by looking at organizational aging and growth not as linear progressions, but as a sequence of distinct transitions between "stages of development."

Hypothesis 1: The older the organization, the more formalized its behavior.[2] Here we encounter the "we've-seen-it-all-before" syndrome, as in the case of the tenured college professor whose students follow his lecture word for word from the notebook of a previous student, or the government clerk who informs you that your seemingly unique problem is covered in Volume XXII, Page 691, Paragraph 14, a precedent set in 1915. As organizations age, all other things being equal, they repeat their work, with the result that it becomes more predictable, and so more easily and logically formalized.

Hypothesis 2: Structure reflects the age of founding of the industry. This curious hypothesis is suggested in the work of Arthur Stinchcombe

[2]We word these hypotheses factually, in terms of the findings of the research. Given that many also reflect analyses of organizational effectiveness, they might just as well have been worded prescriptively—for example, "The older the organization, the more its behavior *should* be formalized," or, "the more effective it will be *if* its behavior is formalized" (assuming in all cases, of course, no matter what the wording, that all other factors remain the same, an assumption that will prove important later, as we move into the discussion of configurations).

(1965), who studied contemporary organizations operating in industries founded in four different eras. He found a relation between age of industry and job specialization as well as the use of trained professionals in staff positions. For example, organizations of the prefactory era—farms, construction firms, retail stores, and the like—tend today to rely more heavily on family personnel, retaining a kind of craft structure, whereas those of the early nineteenth century—apparel, textiles, and so on—use virtually no unpaid family workers, but many clerks, a sign of bureaucracy. Those of the next era—railroads and coal mines—tend to rely heavily on professional managers in place of owner-managers, a second stage of "bureaucratization of industry," in Stinchcombe's opinion. And organizations whose industries date from the next era—motor vehicles, chemicals, electric utilities, and so on—are distinguished by the size of their staff departments and their use of professionals in their administrative structures. Stinchcombe stops here, but the obvious question concerns the industries of our era—aerospace, electronics, film making. Do they exhibit distinctive structural characteristics? Later we shall see clear evidence that they do indeed.

Hypothesis 3: The larger the organization, the more elaborate its structure—that is, the more specialized its tasks, the more differentiated its units, and the more developed its administrative component. This relationship would seem to spring from job specialization, from an organization's increasing ability to divide its labor as it adds employees and increases its volume of output. Thus, one study by a McGill MBA group found that while "grandpa" could do virtually everything in the family food store, when it became a full-fledged supermarket, there was a need to specialize: ". . . 'grandpa' handled the buying of produce. 'Grandma' supervised the store operations. 'Father' dealt with the procurement of the rest of the goods, whereas 'mother' handled the cash."[3] Likewise, with a greater division of labor, the units can be more extensively differentiated. In other words, increased size gives greater homogeneity of work within units but greater diversity of work between units. But the more differentiated the structure, the more emphasis that must be placed on coordination. Hence, the larger organization must use more, and more elaborate, coordination devices, such as a larger hierarchy to coordinate by direct supervision, more behavior formalization to coordinate by the standardization of work processes, more sophisticated planning and control systems to coordinate by output standardization, or more liaison devices to coordinate by mutual adjustment. All this means a more elaborate administrative component, with a sharper administrative division of labor. That means that we should expect sharper lines drawn between the operators who do the

[3]From a paper submitted to the author in Management Policy 701, McGill University, November 1969, by Selin Anter, Gilles Bonnier, Dominique Egre, and Bill Freeman.

work, the analysts who design and plan it, and the managers who coordinate it. Thus, although it is not uncommon for the president of a small company to roll up his sleeves and fix a machine, or to serve in the role of analyst in designing an inventory system, we would be surprised to see the president of a large company doing these things.

Typically, the industrial firm in mass production, as it grows, first develops its basic operating functions of production, marketing, and so forth. Then it elaborates its administrative hierarchy, particularly its technostructure. Later it tends to integrate vertically—that is, take over some of the activities of its suppliers and customers—and thereby further differentiate its structure along functional lines. Finally it diversifies—introduces new product lines—and expands its geographical markets, first domestically and then internationally. These last changes require the firm to further differentiate its structure, but this time along market lines; eventually, it superimposes a market grouping—product or geographical, or both—on its traditional functional structure.

In fact, this sequence of structural elaboration describes not only the individual business firm but also the whole of industrial society. At the turn of the century, the typical American firm was small, functionally structured, and with little administrative hierarchy; today, U.S. industry is dominated by giant divisionalized corporations with very elaborate administrative structures. In effect, whole societies of organizations grow and elaborate their structures over time. And this, of course, is the very point Stinchcombe was making. The forces of economic and technological development have brought new industries with new structures, as well as ever-larger organizations, and all these changes have caused increasing structural elaboration.

Hypothesis 4: The larger the organization, the larger the average size of its units. Obviously, as an organization adds new employees, it must eventually form new units, each with a new manager, and it must also add more managers over these managers. In other words, it must elaborate its administrative hierarchy. Not so obvious is that this elaboration is moderated by an increase in average unit size. As organizations grow, they apparently call on their managers to supervise more and more employees. We can explain this in terms of the relation between size and specialization, discussed above. As positions in the organization become more specialized and the units more differentiated, each becomes easier to manage. It is one thing to supervise twenty operators all sewing red sweatshirts, or even twenty managers running identical supermarkets; it is quite another to supervise a like number of couturiers, each making a different dress, or a like number of department-store merchandise managers, with different and often overlapping product lines. Furthermore, not only is the work of like specialists more easily supervised, it is also more easily standardized. As a result, the manager's job can be partially institutionalized—replaced

by technocratic systems of behavior formalizing or activity planning—thus reducing his workload and enabling him to supervise more people. Thus, to the extent that larger organization size means greater specialization, it also means larger unit size.

Hypothesis 5: The larger the organization, the more formalized its behavior. Just as the older organization formalizes what it has seen before, so the larger organization formalizes what it sees often. ("Listen, mister, I've heard that story at least five times today. Just fill in the form like it says.") More formally, the larger the organization, the more behaviors repeat themselves; as a result, the more predictable they become; and so the greater the propensity to formalize them. Furthermore, with increased size comes greater internal confusion, and perhaps lower morale owing to impersonalism. Management must find the means to make behavior more predictable, and so it turns to rules, procedures, job descriptions, and the like, all devices that formalize behavior. The findings of the last two hypotheses also suggest increasing formalization with increasing size. With their greater specialization, more unit differentiation, greater need for coordination (particularly by formal means), more elaborate administrative hierarchies, and sharper distinctions between operators, analysts, and managers, it follows that larger organizations will be more regulated by rules and procedures and make greater use of formal communication.

The relationships that we have been discussing in these last three hypotheses are summarized graphically in Figure 6–1.

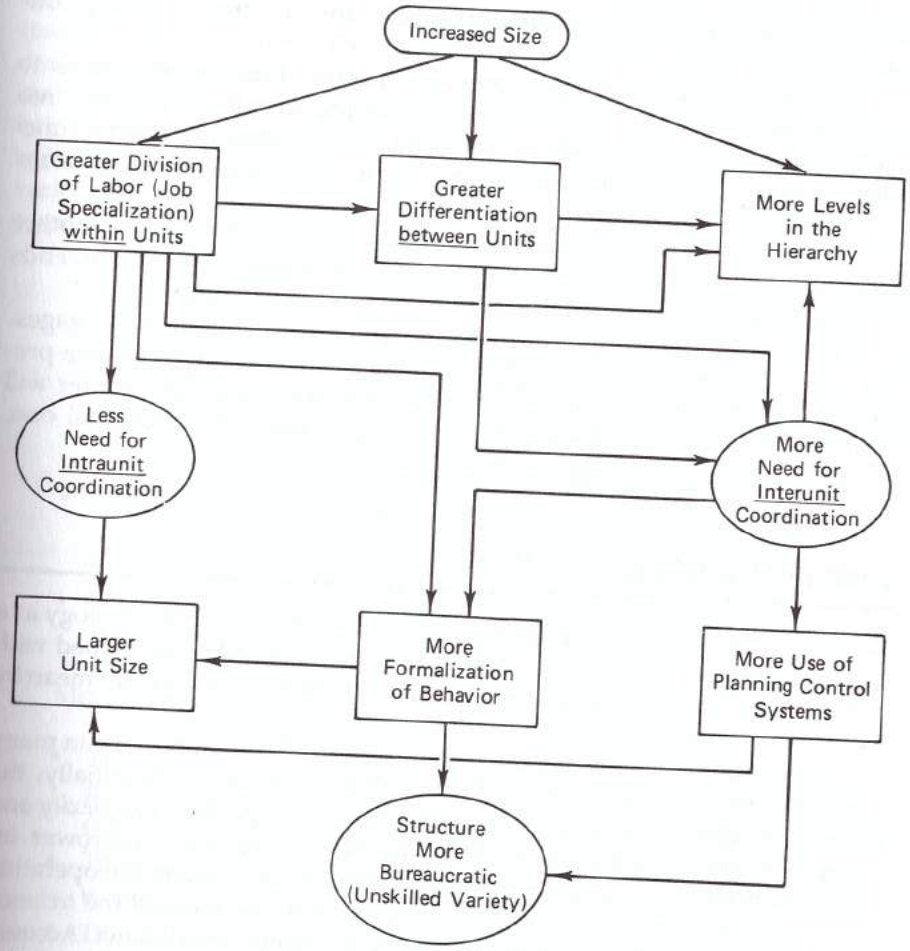
Stages of structural development

Most of these relationships (including those of Figure 6–1, but excluding that of Stinchcombe), imply a kind of continuity—steady growth responded to by continuous changes in structure. But a good deal of other evidence, even though in some ways consistent with the conclusions above, suggests otherwise. Serious changes in structure tend to occur in spurts—in irregular transitions, equivalent to revolutions, following and followed by periods of relative stability in the design parameters.

William Starbuck argued this point eloquently back in 1965 with his "metamorphosis models," which viewed growth not as "a smooth continuous process" but as one "marked by abrupt and discrete changes" in condition and structure (p. 486). Changes more of kind than degree, these transitions bring fundamentally new ways to divide the organization's work and to coordinate it. Thus, just as the pupa sheds its cocoon to emerge as a butterfly, so too does the organic structure shed its informal relationships to emerge as a bureaucracy (hardly as delightful a metamorphosis). These models are generally referred to as ones of stages of growth or development.

A number have been proposed in the literature, but all seem to describe different aspects of the same sequence. Organizations generally begin their lives with nonelaborated, organic structures. Some begin in the *craft* stage and then shift to an *entrepreneurial* stage as they begin to grow, although more seem to begin in the entrepreneurial stage itself, led by powerful chief executives who coordinate largely by direct supervision.

As organizations in the entrepreneurial stage age and grow, they begin to formalize their structures and eventually make the transition to a new stage, that of *bureaucratic* structure. Jobs are specialized, hierarchies of



Note: Similar to that suggested in Blau and Schoenherr (1971); assumes conditions of technical system and environment held constant.

Figure 6-1. *Path diagram of the relationships between organizational size and structure*

authority built, and technostructures added to coordinate by standardization.

Further growth and aging often encourage these bureaucracies to diversify and then, like the overgrown amoeba, to split themselves into market-based units, or divisions, superimposed on their traditional functional structures, thus bringing them into a new stage, of *divisionalized* structure.

Finally, some recent evidence suggests that there may be another stage for some organizations, that of *matrix* structure, which transcends divisionalization and causes a partial reversion to organic structure.

Of course, not all organizations need pass through all these stages. But many do seem to go through a number of them in the sequence presented, sometimes stopping at some intermediate stage. The reader will recall the story of Ms. Raku and Ceramico, a typical if apocryphal one, introduced on the first pages of this book.

Technical System

It has been difficult up to this point to keep from discussing technology as a factor in organization design. Clearly, structure is tightly intertwined with it. But before considering how, we must make quite clear what we mean by the terms we shall use.

Technology is a broad term that has been used—and abused—in many contexts. We prefer to avoid it. For its broader meaning—essentially, the knowledge base of the organization—we shall use the term *complexity* and discuss it under environment. Here we shall focus on a narrower interpretation of technology—namely, the instruments used in the operating core to transform the inputs into outputs, which we shall call the *technical system* of the organization. Note that the two concepts are distinct. Accountants, for example, apply a relatively complex technology (that is, base of knowledge), with a simple technical system—often no more than a sharp pencil. Alternatively, most people drive automobiles without ever knowing what goes on under the hood; in other words, they use a fairly complex technical system with hardly any technological knowledge at all.

In discussing the effect of the technical system on the structural parameters, we find it convenient to introduce our framework or organizational types first, and then turn to hypotheses.

Woodward's study of unit, mass, and process production

We have already referred to Joan Woodward's pathbreaking analysis of the effects on structure of different forms of technical systems used in industry. Woodward focused on three basic systems of production—unit (essentially custom), mass (of many standard items), and process (the intermittent or continuous flow of fluids). These systems also relate to stages and eras, unit production in good part predating the Industrial Revolution, mass production being largely associated with it, and process production being largely a phenomenon of the twentieth century. Woodward found some marked relationships between these three systems of production and various of the design parameters. Specifically, in moving from unit to mass to process production:

- The span of control of the chief executives increased.
- The span of control of middle managers decreased.
- The ratio of managers to nonmanagers increased (from an average of 1 to 23, to 1 to 16, to 1 to 8); also, their qualifications rose (process organizations had more graduates, more managerial training, and more promotion from within).
- The ratio of clerical and administrative personnel to production personnel (indirect salaried to hourly paid) increased (from 1 to 1, to 4 to 1, to 9 to 1).
- The number of levels of management in the production department increased.

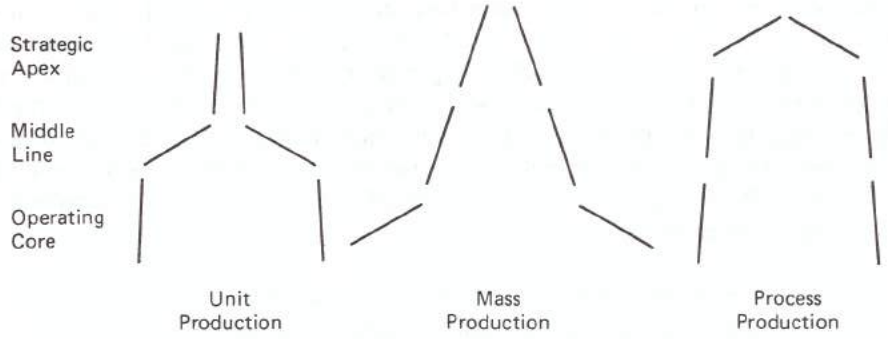
Moreover:

- The span of control of the first-line supervisors was highest in mass-production firms (about 48, compared with about 13 in process firms and 23 in unit-production firms).
- The mass-production firms had the smallest proportion of skilled workers.
- The mass-production firms were bureaucratic in structure, whereas the process- and unit-production firms tended to be organically structured.

But what distinguishes this study from the others is not these random observations but the way Woodward used them to paint an integrated picture of three distinctly different organizational structures associated with the three technical systems.

Unit production

The firms that manufactured individual units, prototypes, and large equipment in stages exhibited a number of characteristics in common. Most important, because their outputs were ad hoc or nonstandard, the unit producers' operating work could likewise not be standardized or for-



Note: Shapes denote narrow, intermediate, and wide spans of control as Woodward described them.

Figure 6-2. *Spans of control at three levels in three technical systems (based on the findings of Woodward, 1965)*

malized, and so their structures were organic. Any coordination that could not be handled by mutual adjustment among the operators themselves was resolved by direct supervision by the first-line managers. Being directly responsible for production, the first-line managers worked closely with the operators, typically in small work groups. This resulted in a narrow span of control at the first level of supervision. (The spans of control for the three different structures at three levels in the hierarchy are shown symbolically in Figure 6–2.) Woodward characterizes unit production as craft in nature, with the structure built around the skills of the workers in the operating core.

These characteristics, in turn, meant little elaboration of the administrative structure. With most of the coordination in the unit-production firms being ad hoc in nature, handled by mutual adjustment among the operators or direct supervision by the first-line managers, there was little need for an elaborate managerial hierarchy above them or a technostructure beside them. Thus, of the three forms of production, the unit type had the smallest proportion of managers and, as can be seen in Figure 6–2, the widest span of control at the middle levels. At the strategic apex, however, the span of control tended to be narrow, a reflection perhaps of the ad hoc nature of the business. Not assured of a steady stream of orders, as in more routine production, the top managers had to spend more time with customers and so could not supervise as many people.

Mass production

If the structures of the unit-production firms were shaped by the nonstandard nature of their technical systems, those of the mass producers were shaped by the standard nature of theirs. Here mass standardized production led to formalized behavior, which led to all the characteristics of the classic bureaucracy. Operating work was routine, unskilled, and highly formalized. Such work required little direct supervision, resulting in wide spans of control for the first-line supervisors. The administration contained a fully developed technostructure to formalize the work. Woodward notes that the mass producers, unlike the other two, conformed to all the patterns of the traditional literature—clearly defined work duties, emphasis on written communication, unity of command, span of control at top levels often in the 5–7 range, a rigid separation of line and staff, and considerable action planning, long-range at the strategic apex (owing to the long product development cycles), short-range at lower levels (primarily to deal with sales fluctuations).

Moreover, Woodward found the structures of the mass-production firms to be the most segmented of the three and the most riddled with hostility and suspicion. She identifies three major points of conflict: (1) between the technical and social systems of the operating core, which gives rise to conflict that Woodward considers fundamentally irreconcilable, even in the well-run mass-production organization; (2) between the short-range focus of the lower-level managers and the long-range focus of the senior managers; (3) and between the line and staff groups in the administrative structure, one with authority, the other with expertise.

Hunt (1970:171–72) refers to this second Woodward group as "performance" organizations, in contrast to the other two, which he calls "problem-solving" organizations. In Hunt's view, whereas the unit producers handled only exceptions and the process firms were concerned only with exceptions, the mass producers experienced fewer exceptions, these were of a less critical nature, and many of them could be handled by formal routines. These mass-production performance organizations spent their time fine-tuning their bureaucratic machines.

Process production

In firms built for the continuous production of fluid substances, Woodward found another structure again. What would cause these firms to be different from the mass producers? And why should Hunt describe them as problem solvers, concerned only with exceptions?

The answer seems to lie in a metamorphosis of structure when a technical system becomes so regulating that it approaches the state of automation. Mass production is often highly mechanized, but, if Woodward's findings are a fair guide, seldom to the point of automation. The result is work that is highly regulated—simple, routine, and dull—requiring a large contingent of unskilled operators. And this, in turn, breeds an obsession with control in the administrative structure: supervisory, especially technocratic, personnel are required to watch over and standardize

the work of uninterested operators. With automation—which Woodward's findings suggest to be more common in process production—comes a dramatic reduction in the number of unskilled operators tied directly to the pace of production. Some giant oil refineries, for example, can be operated by six people, and even they only serve as monitors; the technical system runs itself.

With this change in the operating work force comes a dramatic change in structure: the operating core transcends a state of bureaucracy—in a sense, it becomes totally bureaucratic, totally standardized, but without the people—and the administration shifts its orientation completely. The rules, regulations, and standards are now built into machines, not workers. And machines never become alienated, no matter how demeaning their work. So out goes the need for direct supervision and technocratic standardization and with it the obsession with control. And in comes a corps of technical specialists, to design the technical system and then maintain it. In other words, automation brings a replacement in the operating core of unskilled workers directly tied to the technical system by skilled workers to maintain it, and in the middle levels of the structure a replacement of managers and technocratic staff who control the work of others by a support staff of professional designers who control their own work. And these changes dissolve many of the conflicts of the mass-production firms. Alienated operators no longer resist a control-obsessed management. Even at the strategic apex, "the company executives are increasingly concerned not with running today's factory, but with designing tomorrow's" (Simon, 1977:22–23). And staff need no longer battle line. This classical distinction—between those who advise and those who choose—becomes irrelevant when it is the control of machines that is at stake. Who gives orders to a machine, its staff designer or its line supervisor? Logically, decisions are taken by whoever has the specialized knowledge needed to make them, whether they be called line or staff.

With these points made, the Woodward findings about the process-production firms fall neatly into place, at least assuming that they are highly automated.[4] She found that the process producers' structures were generally organic in nature. Their operating cores consisted mostly of skilled, indirect workers, such as the service people who maintained the equipment. As in the unit-production firms, the first-level supervisory spans of control were narrow, again a reflection of the need for skilled operators to work in "small primary working groups." This led to a "more intimate and informal" relationship between operator and supervisor than

[4]This assumption does not always appear to hold. For example, steel companies in process production require large operating work forces. In these cases, as we shall see later, the structures take on the form of the mass producers. So the Woodward findings really seem to hold for automated production, not for process production per se, although that is where automation is most common.

in the mass-production firms, "probably a contributing factor to better industrial relations" (p. 60).

Of Woodward's three types, the process producers relied most on training and indoctrination, and had the highest ratios of administrators to operators, a reflection of the extensive use of support staff who designed the technical systems and also carried out functions such as research and development. They, too, tended to work in small groups—teams and task forces—hence the finding of narrow spans of control at middle levels as well. Woodward also found that the line/staff distinction was blurred in the process firms, it being "extremely difficult to distinguish between executive and advisory responsibility" (p. 65). In some firms, the staff specialists were incorporated into the line structure; in others, "the line of command seemed to be disintegrating, executive responsibility being conferred on specialist staff" (p. 65). But it made little real difference; in any event, the line managers had training and knowledge similar to that of the staff specialists, and the two in fact interchanged jobs regularly.

These firms also exhibited a sharp separation between product development and operations, resulting in a structure with two independent parts: an inner ring of operations with fixed facilities, short-range orientation, and rigid control built into the machinery; and an outer ring of development—both product and process—with a very long-range orientation, loose control, and an emphasis on social relations. This two-part structure served to reduce conflict, first because it detached the technical and social systems from one another, unlike mass production, which put them into direct confrontation (here people could be free while machines were tightly controlled), and second, because it served to decouple the long- and short-range orientation. Another major source of conflict in the mass-production firms was reduced with the blurring of the line/staff distinction.

At the strategic apex of the process-production firms, Woodward found a tendency to use "management by committee" instead of by single decision makers. This was far less true of unit and mass producers. Yet she also found wide spans of control at the strategic apex, a finding that might be explained by the ability of the specialists lower down to make many key decisions, thereby freeing the top managers to supervise a large number of people. Perhaps the high-level committees served primarily to ensure coordination, by authorizing the choices made lower down.

To conclude, the dominant factor in the process-production firms Woodward studied seems to have been the automation of their technical systems. Automation appears to place an organization in a "postbureaucratic" state: the technical system is fully regulating, but of machines, not people, and the social system—largely outside the operating core—need not be controlled by rules and so can emerge as an organic structure, using mutual adjustment among the experts, encouraged by the liaison devices, to achieve coordination. Thus, the real difference between

Woodward's mass and process producers seems to be that although both sought to regulate their operating work, only the latter could automate it. In having to regulate people, the mass producers developed a control mentality that led to all kinds of conflict; in regulating machines, the process producers experienced less conflict.

With these findings in mind, we can now present three basic hypotheses about the relationships between structure and technical system.

Hypothesis 6: The more regulating the technical system, the more formalized the operating work and the more bureaucratic the structure of the operating core. As the technical system becomes more regulating—that is, broken down into simple, specialized tasks that remove discretion from those who have to use it—the operating work becomes more routine and predictable; as a result, it can more easily be specialized and formalized. Control becomes more impersonal, eventually mechanical, as staff analysts who design the work flow increasingly take power over it away from the unskilled workers who operate it and the managers who supervise them. We saw all these relationships clearly in Woodward's mass-production firms. But what about those in process production? As Woodward described it, this technical system was almost completely regulating—that is, automated. Yet she characterized the structures of these firms as organic. But she meant the administrative structures, where the people were found. Their operating cores were, in a sense, almost perfectly bureaucratic; that is, in production (if not maintenance), their operating work was perfectly standardized; it just did not involve people.

Hypothesis 7: The more sophisticated (difficult to understand) the technical system, the more elaborate the nonoperating structure—specifically, the larger and more professional the support staff, the greater the selective decentralization (to that staff), and the greater the use of liaison devices (to coordinate the work of that staff). If an organization is to use complex machinery, it must hire staff specialists who can understand that machinery, who can design, purchase, and modify it; it must give them considerable power to make decisions concerning that machinery; and they, in turn, must work in teams and task forces to make those decisions. Hence, we would expect organizations with sophisticated technical systems to have a high proportion of support staff, to rely heavily on the liaison devices at middle levels, to favor small units there, and to decentralize selectively—that is, give the support staff power over the technical decisions. All these conclusions are suggested in the Woodward study; specifically, in the absence of an elaborate staff structure in the unit-production firms, generally with the least sophisticated technical systems, and in the presence of all these features in the process firms, generally with the most sophisticated technical systems.

Hypothesis 8: The automation of the operating core transforms a bureaucratic administrative structure into an organic one. We have already discussed this hypothesis at some length in terms of Woodward's process producers. Organizations dominated numerically by unskilled operators doing routine work are riddled with interpersonal conflicts. As Woodward notes, these stem largely from the inherent incompatibility of the social and technical systems: often, what is good for production is simply not good for the producer. As a result, mass-production firms develop an obsession with control—a belief that the workers must be constantly watched and pushed if they are to get their work done. Moreover, the control mentality spills over the operating core and affects all levels of the hierarchy, from the first level of supervision to the strategic apex. Control becomes the watchword of the organization. Top managers watch over middle managers, middle managers watch over operators and staff specialists, and staff specialists design systems to watch over everyone. Automation does not simply bring about more regulation of the activities of the operating core; as we saw, it eliminates the source of many of the social conflicts throughout the organization.[5] Moreover, drawing on our last hypothesis, automated technical systems, typically being the most sophisticated, require the largest proportion of staff specialists. These people tend to communicate among each other informally and to rely for coordination on the liaison devices. And these, of course, are the most flexible of the design parameters. Thus, automation of the operating core breeds all kinds of changes in the administrative structure that drive it to the organic state.

This leads us to an interesting social implication: that one apparent solution to the problems of impersonal bureaucracy is not less regulation of operating tasks but more, to the point of automating them. Automation seems to humanize the traditional bureaucratic structure, something that democratization proves unable to do.[6]

Environment

We have so far discussed the influence on structure of factors intrinsic to the organization itself—its age, its size, and the technical system it uses in its operating core. But every organization also exists in a milieu to which it must respond when designing its structure. Now we consider situational factors associated with this milieu; first the characteristics of the general environment, then specific aspects of the system of power faced by the organization.

[5]New conflicts, however, arise in the organization with an automated operating core, as we shall see later, notably among the different specialists. But these do not regenerate the control mentality; rather, they arise in the absence of it.

[6]But we might ask whether automation has the opposite effect for the clients, further standardizing and impersonalizing the products and services they receive.

What does the word *environment* really mean? The dictionary is as vague as the literature of management: "the aggregate of surrounding things, conditions, or influences . . ." (*Random House Dictionary*). So environment comprises virtually everything outside the organization—its "technology" (the knowledge base it must draw upon); the nature of its products, customers, and competitors; its geographical setting; the economic, political, and even meteorological climate in which it must operate; and so on. What the literature does do, however, is focus on certain dimensions of organizational environments, four in particular:

1 *Stability.* An organization's environment can range from *stable* to *dynamic,* from that of the wood carver whose customers demand the same pine sculptures decade after decade, to that of the detective squad that never knows what to expect next. A variety of factors can make an environment dynamic, including unstable government, unpredictable shifts in the economy, unexpected changes in customer demand or competitor supply, client demands for creativity or frequent novelty as in an advertising agencies, rapidly changing technologies as in electronics manufacturing, even weather that cannot be forecasted, as in the case of open-air theater companies. Notice that *dynamic* here means unpredictable, not variable; variability may be predictable, as in steady growth of demand.

2 *Complexity.* An organization's environment (here, its "technology") can range from *simple* to *complex,* from that of the manufacturer of folding boxes who produces his simple products with simple knowledge, to that of the space agency that must utilize knowledge from a host of the most advanced scientific fields to produce extremely complex outputs. Clearly, the complexity dimension affects structure through the intermediate variable of the comprehensibility of the work to be done. Note that rationalized knowledge, no matter how complex in principle, is here considered simple because it has been broken down into easily comprehended parts. Thus, automobile companies face relatively simple product environments by virtue of their accumulated knowledge about the machines they produce.

3 *Market Diversity.* The markets of an organization can range from *integrated* to *diversified,* from that of an iron mine that sells its one commodity to a single steel mill, to those of a trade commission that seeks to promote all a nation's industrial products all over the world. Market diversity may result from a broad range of clients, of products and services, or of geographical areas in which the outputs are marketed. Clearly, market diversity affects the structure through the intermediate variable of the diversity of the work to be done.

4 *Hostility.* Finally, an organization's environment can range from *munificent* to *hostile,* from that of a prestige surgeon who picks and chooses his patients, through that of a construction firm that must bid on all its contracts, to that of an army fighting a war. Hostility is influenced by competition, by the organization's relations with unions, government, and other outside groups, and by the availability of resources to it. Of course, hostile environments are typically dynamic ones. But extreme hostility has a special effect on structure that we wish to distinguish. Hostility affects structure especially through the intermediate variables of the speed of necessary response.

What matters about environment in the design of structure is its specific effect on the organization. In other words, it is not the environment per se that counts but the organization's ability to cope with it—to predict it, comprehend it, deal with its diversity, and respond quickly to it. That is why, for example, when discussing the complexity dimension, we noted that if the organization is able to rationalize what seems to be a complex product into a system of simple components, its product environment can be called simple. Also, although it is convenient to discuss an organization's environment as uniform—a single entity—the fact is that every organization faces multiple environments. The products may be complex but the marketing channels simple, the economic conditions dynamic but the political ones stable. Often, however, it is a reasonable approximation to treat the environment as uniform along each of its dimensions, either because some of its more placid aspects do not really matter to the organization or, alternatively, because one active part of the environment is so dominant that it affects the entire organization. We shall proceed under this assumption in the first four hypotheses presented below, each considering one of the dimensions, taking up the case of contradictory demands from the environment in the fifth hypothesis.

Hypothesis 9: The more dynamic the environment, the more organic the structure. In peacetime, or well back from the battlefield in wartime, armies tend to be highly bureaucratic institutions, with heavy emphasis on planning, formal drills, and ceremony, close attention being paid to discipline. On the battlefield, at least the modern one, there is the need for greater flexibility, and so the structure becomes less rigid. This is especially so in the dynamic conditions of guerrilla warfare. It stands to reason that in a stable environment, an organization can predict its future conditions and so, all other things being equal, can easily insulate its operating core and standardize its activities there—establish rules, formalize work, plan actions—or perhaps standardize its skills instead. But this relationship also extends beyond the operating core. In a highly stable environment, the whole organization takes on the form of a protected, or undisturbed system, which can standardize its procedures from top to bottom. Alternatively, faced with uncertain sources of supply, unpredictable customer demand, frequent product change, high labor turnover, unstable political

conditions, or rapidly changing technology (knowledge), the organization cannot easily predict its future, and so it cannot rely on standardization for coordination. It must use a more flexible, less formal coordinating mechanism instead—direct supervision or mutual adjustment. In other words, it must have an organic structure.

Note the wording of Hypothesis 9: Dynamic environments lead to organic structures, instead of stable environments leading to bureaucratic ones. This wording was chosen to highlight the asymmetrical nature of the relationship—that dynamic conditions have more influence on structure than do static ones. Specifically, there is evidence to suggest that a dynamic environment will drive the structure to an organic state despite forces of large size and regulating technical system that act in the opposite direction, whereas a stable environment will not override the other situational factors—the structure will be bureaucratic to the extent called for by these other factors.

Hypothesis 10: The more complex the environment, the more decentralized the structure. Before proceeding with discussions of this hypothesis, it will be useful to clarify the distinction between environmental stability and complexity.

Conceptually, it is not difficult to distinguish between these two dimensions of environment. The dice roller easily comprehends his game, yet he cannot predict its outcome. His environment is simple but dynamic. So, too, is that of the dress manufacturer, who easily comprehends his markets and technologies yet has no way to predict style or color from one season to the next. In contrast, the clinical surgeon spends years trying to learn his or her complicated work, yet undertakes it only when rather certain of its consequences. This environment is complex but stable. Despite this, perhaps because many organizations face environments that are simple and stable or complex and dynamic, these two dimensions have often been confused. Yet we shall soon see that important types of organizations face, in one case, simple and dynamic, and in another, complex and stable environments. Again we can turn to our coordinating mechanisms to help resolve the confusion.

Our tenth hypothesis suggests that the complexity dimension has a very different effect on structure from the stability one. Whereas the latter affects bureaucratization, the former affects decentralization. One of the problems in disentangling Hypotheses 9 and 10, aside from the fact that the two environmental variables often move in tandem, is that the most bureaucratizing of the coordinating mechanisms—the standardization of work processes—also tends to be rather centralizing, whereas one of the most organic—mutual adjustment—tends to be the most decentralizing. The relationship between the five coordinating mechanisms and bureaucratization was discussed in Chapter 2, that between the mechanisms and decentralization in Chapter 5. Figure 6–3 summarizes these two discussions, with the coordinating mechanisms of increasing bureaucratization shown along the ordinate and those of increasing decentralization along the abscissa (the latter is, in fact, a replication of Figure 5–3).

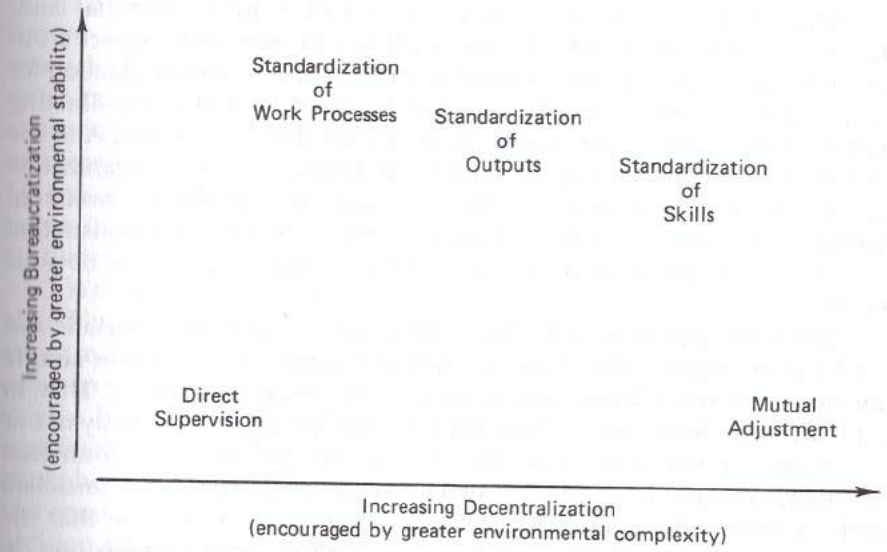


Figure 6-3. *Coordinating mechanisms on scales of decentralization and bureaucratization*

We can draw on an argument of Galbraith to use the coordinating mechanisms as shown in Figure 6–3 to disentangle the two hypotheses, and thereby to develop more support for each. Galbraith argues that coordination is most easily achieved in one brain. Faced, therefore, with a simple environment, the organization will tend to rely on one brain to make its key decisions; in other words, it will centralize. Should that environment also be stable, according to Hypothesis 9 it will be in the organization's best interests to standardize for coordination—in other words, to bureaucratize. As can be seen in Figure 6–3, the organization will select the standardization of work processes for coordination, the mechanism that enables it to maintain the tightest centralization within a bureaucratic structure. But should its simple environment be dynamic instead of stable, the organization can no longer bureaucratize but must, rather, remain flexible—organic. So, as Figure 6–3 shows, it will rely on direct supervision for coordination, the one mechanism of the five that enables it to have a structure that is both centralized and organic.

What about the organization faced with a complex environment? This introduces problems of comprehensibility. In Galbraith's terms, one brain can no longer cope with the information needed to make all the decisions. It becomes overloaded. So the organization must decentralize: The top manager must give up a good deal of his power to others—other manag-

ers, staff specialists, sometimes operators as well. Now, should that complex environment be stable, Hypothesis 9 would lead us to expect a bureaucratic structure—in other words, one that relies on standardization for coordination. In that case, the problem becomes to find a coordinating mechanism that allows for standardization with decentralization. And the solution emerges with a quick glance at Figure 6–3: the organization chooses the standardization of skills. Should the complex environment instead be dynamic, the organization seeks a coordinating mechanism that is both decentralizing and organic. Mutual adjustment is the obvious choice.

What emerges from this discussion are two kinds of bureaucratic and two kinds of organic structures, in each case a centralized one for simple environments and a decentralized one for complex environments. That, in fact, corresponds exactly to the conclusion that emerged repeatedly in our discussion of the design parameters. There, for example, we encountered two fundamentally different bureaucracies, a centralized one for unskilled work, a decentralized one for professional work. Now we see that the former operates in a simple environment, the latter in a complex one, in both cases stable. We shall return to these four types shortly.

Hypothesis 11: The more diversified the organization's markets, the greater the propensity for it to split into market-based units (given favorable economies of scale). Here we propose a relationship between a third environmental variable—market diversity—and a third design parameter—the basis for grouping units. Hypothesis 11 indicates that the organization that can identify distinctly different markets—products or services, geographical regions, or clients—will be predisposed to split itself into high-level units on this basis, and to give each control of a wide range of the decisions affecting its own markets. This amounts to what we called in Chapter 5 limited vertical decentralization, a good deal of the decision-making power being delegated to the managers of the market units. In simple terms, diversification breeds divisionalization.

There is, however, one key impediment to divisionalization, even when markets are diverse, and that is the presence of a common technical system or critical function that cannot be segmented. In divisionalization, each market unit requires its own distinct operating core. This it cannot have when economies of scale dictate a single, unified technical system. Some technical systems can be split up even though of very small scale, and others must remain intact despite massive size. A bakery operating in two states with total sales of, say, $2 million may find it worthwhile to set up a division with its own plant in each, whereas an aluminum producer with sales 100 times as great may, despite a diversity of customers in all fifty states and a variety of end products (foil, sheets, construction components, and so on), be forced to retain a functional structure because it can afford only one smelter.

Likewise, the presence of a function critical to all the markets in common impedes true divisionalization, as in the case of purchasing in the retail chain or investment in the insurance business. The organization still splits itself into market-based units, but it concentrates the critical function at headquarters. This reduces the autonomy of the market units, leading to an incomplete form of divisionalization. In fact, as we shall see in Chapter 11, this is most common when the diversity is based on client or region rather than on product or service, common outputs giving rise to important interdependencies among the different clients or regions.

We can explain Hypothesis 11 in terms similar to those used to explain Hypothesis 10. The organization that must comprehend information about many different aspects of its market environment eventually finds it convenient to segment that environment into distinct markets if it can and to give individual units control over each. In this way it minimizes the coordination of decision making that must take place across units. We must, however, make a clear distinction between environmental diversity and complexity, even though both increase the informational load on the decision makers and thereby encourage some kind of decentralization. A simple environment can be very diverse, as in the case of a conglomerate firm that operates a number of simple businesses, whereas a complex environment may focus on an integrated market, as in the case of the NASA of the 1960s that had one overriding mission—to put a man on the moon before 1970.[7] In fact, for reasons that we shall discuss in Chapter 11, divisionalization appears to be better suited to simple diversified markets than to complex ones.

Hypothesis 12: Extreme hostility in its environment drives any organization to centralize its structure temporarily.[8] Again, we can explain this in terms of our coordinating mechanisms. Direct supervision is the fastest and tightest means of coordination—only one brain is involved. All members of the organization know exactly where to send information; no time is wasted in debate; authority for action is clearly defined; one leader makes and coordinates all the decisions. As we saw in Chapter 5, the more centralized communication networks organized themselves more quickly and required less communication to make decisions. When an organization faces extreme hostility—the sudden loss of its key client or source of supply, severe attack by the government, or whatever—its very survival is threatened. Since it must respond quickly and in an integrated fashion, it turns to its leader for direction.

[7] NASA, of course, had other missions—for example, to launch weather satellites. But the Apollo project was dominant in the 1960s.

[8] It seems reasonable to hypothesize further that extreme hostility drives the organization to organic structure as well, in that hostile environments are unpredictable ones, requiring flexible responses. However, no evidence was found regarding this relationship.

But what of the organization in a complex environment that faces extreme hostility? The complexity requires it to decentralize in order to comprehend the environment, yet the hostility demands the speed and coordination of a centralized response. Forced to choose, the organization presumably centralizes power temporarily, in order to survive. This enables it to respond to the crisis, even if without due regard for its complexity. With some luck, it may be able to ride it out. But should the crisis persist, the organization may simply be incapable of reconciling the two opposing forces. It may simply expire.

Hypothesis 13: Disparities in the environment encourage the organization to decentralize selectively to differentiated work constellations. No organization has ever existed in an environment uniformly dynamic, complex, diverse, or hostile across its entire range. But the organization need not respond to every contingency in its environment either. Some are exigent, demanding responses; others are placid, requiring none. Dynamic economic conditions may require organic structure even though the political environment is stable; hostility from the union in an otherwise munificent environment may require temporary centralization followed by a return to decentralization. But what happens when one contingency does not dominate, when disparities in the environment call for different responses in the design of the structure? Take the case of mixed competition in the large oil company:

> Mobil Oil and Exxon may compete furiously at the intersection of two streets in any American town, but neither of them is really threatened by this marginal competition. They work very closely together in the important matter of oil depletion allowances, our foreign policy about the Mideast, federal tax policies, the pollution issues, and private transit versus mass transit. . . . Where, then, is the furious rate of competition? At the lower levels in the organization—the levels of the regional manager who moves prices up and down a fraction and the station manager who washes the windshields and cleans the rest rooms. (Perrow, 1974:41)

What this example suggests is that disparities in the environment encourage the organization to differentiate its structure, to create pockets—what we earlier referred to as work constellations—to deal with different aspects of the environment (different "subenvironments").[9] Each constellation is located according to the effect of its subenvironment on the organization—near the top if the effect is universal, farther down if it is local. The managers at the top of the oil company can attend to cooperation

[9]This is, of course, akin to the tendency to divisionalize when markets are diverse, except that here the disparities cut across different environmental dimensions, and the response is to differentiate the structure along functional lines (and often vertically), instead of market lines (and horizontally).

while those in the regions deal with the competition. Each work constellation is given power over the decisions required in its subenvironment, and each is allowed to develop the structure its decision processes require. For example, one constellation of an organization may be organically structured to handle dynamic conditions, and others, operating in stable subenvironments, may be structured bureaucratically. We saw this earlier in the case of the new venture teams isolated from the rest of their structures. Thus, disparities in the environment encourage the organization to differentiate its structure and to use selective decentralization in both the vertical and horizontal dimensions. In other words, it can centralize and decentralize at the same time.

This is clearly illustrated by the McGill MBA group study of the Canadian subsidiary of a European recording company. There were two sharply differentiated constellations here. One, at the strategic apex, comprised the top managers sent from the European headquarters. They handled liaison with it, the financial affairs of the company, and some of the production problems, all relatively stable and simple issues. But the marketing decisions—in particular, what Canadian stars and songs to record—required intimate knowledge of the local scene, of the tastes of the Canadian consumers, both English and French, and of Canadian entertainment personalities. It also required a very different orientation to decision making. With a product life cycle of three months ("there is nothing quite so dead as yesterday's number one hit on the hit parade") and with the most dynamic of supply markets (recording artists being "notoriously hard to get along with"), marketing required a free-wheeling style of decision making, in sharp contrast to that of the rather straightlaced European executives. Thus, a second work constellation was created below the first and given complete and undisputed power over marketing decisions. It worked in a structure for which the word "organic" seemed an understatement.[10]

An organizational type for each of four environments

Our discussion of the environment again supports our contention that we learn more by focusing on distinct types of structures found under specific conditions than by tracing continuous relationships between structural and situational variables. Hypotheses 9 and 10, although initially stated in terms of continuous relationships, seem more powerful when used to generate specific types of structures found in specific kinds of environments. In particular, four basic types emerge from that discussion, shown in matrix form as follows:

[10]From a paper submitted to the author by Alain Berranger and Philip Feldman in Management Policy 276–661, McGill University, November 1972.

	Stable	Dynamic
Complex	Decentralized Bureaucratic (standardization of skills)	Decentralized Organic (mutual adjustment)
Simple	Centralized Bureaucratic (standardization of work processes)	Centralized Organic (direct supervision)

Simple, stable environments give rise to centralized, bureaucratic structures, the classic organizational type that relies on standardization of work processes (and the design parameter of formalization of behavior) for coordination. Examples are Woodward's mass-production manufacturing firms and Crozier's tobacco company. Lawrence and Lorsch so describe certain container firms, operating in simple, stable environments, that standardized their products and processes, introduced changes slowly, and coordinated at the top of the hierarchy where information could easily be consolidated and understood. In fact, one container firm that tried to do the opposite—to use the liaison devices to coordinate by mutual adjustment lower down—exhibited lower performance than the others. Apparently, it just confused a simple situation, like four people in a car all trying to decide which way to drive downtown.

Complex, stable environments lead to structures that are bureaucratic but decentralized, reliant for coordination on the standardization of skills. Because their work is rather predictable, the organization can standardize; and because that work is difficult to comprehend, it must decentralize. Power must flow to the highly trained professionals of the operating core who understand the complex but routine work. Typical examples of this are general hospitals and universities.[11]

When its environment is dynamic but nevertheless simple, the organization requires the flexibility of organic structure, but its power can remain centralized. Direct supervision becomes its prime coordinating mechanism. This is characteristic of the entrepreneurial firm, which seeks a niche in the marketplace that is simple to understand yet dynamic enough

[11]We must, therefore, take issue with the conclusion of Beyer and Lodahl that, "If the knowledge taught at the university were a fixed commodity that changed little from year to year, centralization of authority and bureaucratic decision making would be as efficient and effective for universities as for other organizations with stable environments and technologies." (1976:109) Bureaucratic yes, centralized no. Even a university that taught only Latin, Ancient Greek, and Sanskrit would not centralize. These three bodies of knowledge are stable, but together they are too much for central administrators to comprehend. Thus, to the extent that universities teach stable bodies of knowledge—and most of the time, even scientific knowledge remains relatively stable—they bureaucratize and *de*centralize.

to keep out the bureaucracies. In such a place, the entrepreneur can maintain a tight personal control, not even having to share his power with a technostructure.

When the dynamic environment is complex, the organization must decentralize to managers and specialists who can comprehend the issues, yet allow them to interact flexibly in an organic structure so that they can respond to unpredictable changes. Mutual adjustment emerges as the prime coordinating mechanism, its use encouraged by the liaison devices. Research studies have described NASA during the Apollo project, the Boeing Company, and plastics firms in general in this way. (Note, in Stinchcombe's terms, that these are all organizations of our age.)

Market diversity, as discussed in Hypothesis 11, can be viewed as a third dimension—in effect, as a separate condition superimposed on the two-dimensional matrix. These four types of structures will tend to be functional if their markets are integrated, market-based (at least at the highest level of grouping) if they are diversified (assuming favorable economies of scale and an absence of critical functions). Since, as we saw in Chapter 4, coordination in the market-based structure is achieved by the standardization of outputs, effected through performance control systems, we are able to account for our fifth and last coordinating mechanism in this third dimension.

Similarly, Hypothesis 12 can be viewed as imposing another special condition on the two-dimensional matrix. Extreme hostility drives each of the four types to centralize its structure temporarily, no matter what its initial state of decentralization. (Two, of course, are already rather centralized.)

All these conditions assume uniform environments, or at least ones that can be treated as uniform, owing to the dominance of a single characteristic. They are either complex or simple, stable or dynamic, integrated or diversified, extremely hostile or not. Uniformity, in turn, produces consistent use of the design parameters in the structure. Hypothesis 13 drops the assumption of uniformity, indicating that disparities in the environment encourage the organization to respond with a differentiated structure. It sets up work constellations, decentralizes power selectively to them, locates each according to the effect of its decisions on the organization, and allows it to design its internal structure according to the demands of its particular subenvironment.

Power

Organizations do not always adopt the structures called for by their impersonal conditions—their ages and sizes, the technical systems they use, the stability, complexity, diversity, and hostility of their environments. A

number of *power* factors also enter into the design of structure, notably the presence of external control of the organization, the personal needs of its various members, and the fashion of the day, embedded in the culture in which the organization finds itself (in effect, the power of social norms). Three hypotheses describe a number of the findings about these power factors:

Hypothesis 14: The greater the external control of the organization, the more centralized and formalized its structure. A number of studies of both public and private organizations have provided evidence that outside control of them—whether directly by specific owners or indirectly, say, by a major supplier on whom they are dependent—tends to concentrate their decision-making powers at the top of their hierarchies and to encourage greater than usual reliance on rules and regulations for internal control. All this, in fact, seems logical enough. The two most effective means to control an organization from the outside are (1) to hold its most powerful decision maker—its chief executive officer—responsible for its actions, and (2) to impose clearly defined standards on it, transformed into rules and regulations. The first centralizes the structure; the second formalizes it.

Moreover, external control forces the organization to be especially careful about its actions. Because it must justify its behaviors to outsiders, it tends to formalize them. Formal, written communication generates records that can be produced when decisions are questioned. Rules ensure fair treatment to clients and employees alike. External control can also act to bureaucratize the structure by imposing on it more sweeping demands than usual for rationalization. For example, whereas the autonomous firm can deal with its suppliers and clients in the open market, the subsidiary may be informed by headquarters that it must purchase its supplies from a sister subsidiary, and moreover that managers of the two subsidiaries must sit down together to plan the transfers in advance so that no surplus or shortages will result. Or a parent organization or government might insist on standards being applied across the whole range of organizations it controls. It may demand anything from the use of a common logo, or corporate symbol, to a common management information system or set of purchasing regulations. Entrepreneurial firms with organic structures that are purchased by larger corporations are often forced to develop organigrams, specify job descriptions and reporting relationships more clearly, and adopt action planning and a host of other systems that bureaucratize their structures.

To conclude, Hypothesis 14 indicates that when two organizations are the same age and size, use the same technical system, and operate in the same environment, the structure of the one with the greater amount of external control—by government, a parent organization, the unions, or whatever—will be more centralized and more formalized. This, of course, raises all kinds of interesting issues in societies that find more and more of their autonomous organizations being gobbled up by giant conglomerations—big business, big government, big labor. The loss of autonomy means not only the surrender of power to the external controller but also significant changes within the structure of the organization itself, no matter what its intrinsic needs—more power concentrated at its strategic apex, tighter personnel procedures, more standardization of work processes, more formal communication, more regulated reporting, more planning and less adapting. In other words, centralization of power at the societal level leads to centralization of power at the organizational level, and to bureaucratization in the use of that power.

Hypothesis 15: The power needs of the members tend to generate structures that are excessively centralized. All members of the organization typically seek power—if not to control others, at least to control the decisions that affect their own work. The managers of the strategic apex promote centralization in both the vertical and horizontal dimensions; the managers of the middle line promote vertical decentralization, at least down to their own levels, and horizontal centralization to keep power within the line structure; the analysts and the support staff favor horizontal decentralization, to draw power away from the line managers; and the operators seek vertical and horizontal decentralization, all the way down to the operating core.

But the dice of this power game are loaded. To function effectively, organizations typically require hierarchical structures and some degree of formal control. And these naturally put power in the hands of the line managers, as opposed to the staff specialists or the operators, and aggregate that power at the top of the hierarchy, in the hands of the managers of the strategic apex. We have seen that various situational factors—such as a sophisticated technical system and environmental complexity—call for a sharing of central power. But to the extent that the line managers, notably the senior ones, relish power, the structure can easily become excessively centralized. That is, more power can be concentrated at its top than the factors of age, size, technical system, and environment would normally call for (at least until the resulting inefficiencies catch up with the organization).

Hypothesis 16: Fashion favors the structure of the day (and of the culture), sometimes even when inappropriate. Stinchcombe's research, discussed in Hypothesis 2, suggests that there is such a thing as "the structure of the day"—that is, the one favored by industries founded in a given period. But his research also shows that structures transcend periods; in other words, that some organizations retain structures favored in previous periods. The implication of this is that when a new structure comes along, it is appropriate for some organizations but not for others.

This point has, apparently, been lost on a good many organizations, because fashion—the power of the norms of the culture in which the orga-

nization finds itself—seems to play an important role in structural design. We might like to believe that organizations are influenced only by factors such as age, size, technical system, and environment, not by what Jones, Inc., is doing next door. But there is too much evidence to the contrary.

Part of the problem probably lies with the business periodicals and consulting firms eager to promote the latest fad. As Whistler (1975) has noted, "There is still money to be made, and notoriety to be gained, in peddling universal prescriptions. In economic terms, the demand is still there, in the form of executives who seek the gospel, the simple truth, *the one best way*" (1975:4). Paris has its salons of haute couture; likewise, New York has its offices of "haute structure," the consulting firms that bring the latest in high structural fashion to their clients—long-range planning (LRP), management information systems (MIS), management by objectives (MBO), organization development (OD).

In the 1960s, the management media heralded "the coming death of bureaucracy," to use the title of an article by Warren Bennis (1966). And many organizations took this seriously, some to their regret. Thus, when Lawrence and Lorsch describe the low-performance container firm that tried to use integrators—one of the very fashionable tools of organic structure—in a simple, stable environment, we find fashion extracting its toll in inappropriate structural design. Since Bennis's article, it has become evident that bureaucracies will not die. Not as long, at least, as organizations grow old and large, mass-produce their outputs, and find simple, stable environments to nurture their standards. The fact is that articles would not be published and speakers would not attend conferences to tell of "the one best way" if the printers and airlines were not structured as bureaucracies. Today, few would deny that bureaucracies are alive, if not well.

Throughout this century, the swings between centralization and decentralization at the top of large American corporations have resembled the movements of women's hemlines. But the trend toward the use of divisionalization has been consistent, ever since du Pont and General Motors first made it fashionable in the 1920s. Thus, Rumelt found in a study of the Fortune 500 strong support not only for Chandler's (1962) well-known proposition that "structure follows strategy" but for another, that "structure also follows fashion" (1974:149). The use of the divisionalized form increased from 20 percent in 1949 to 76 percent in 1969; but not all of it was explained by market diversification, as Hypothesis 11 would have us believe: "Until the early 1960s the adoption of product-division structures was strongly contingent upon the administrative pressures created by diversification but . . . in more recent years divisionalization has become accepted as the norm and managements have sought reorganization along product-division lines in response to normative theory rather than actual administrative pressure" (p. 77).

Of course, fashionable structure need not be inappropriate structure.

Fashion reflects new advances in organizational design, advances that suit some organizations with older structures. Once the divisionalized form became established, it was appropriately adopted by most diversified companies that had been structured along functional lines.[12] Indeed, those that failed to do so were saddled with structures that suddenly became out of date—less effective than the new alternative. Much like the dowager who always dresses as she did in her heyday, so too the organization may cling to a structure appropriate to days gone by. Thus, one study found that in the absence of competitive pressures, some European companies did not divisionalize even though they were diversified. Placid environments enabled them to retain outdated, ineffective structures (Franko, 1974).

This finding also suggests that structural fashion is in some sense culture-bound. What is all the rage among the Fortune 500 (the largest U.S. corporations) may simply look odd to the Fortune 200 (the largest non–U.S. corporations). West Virginians and Westphalians may simply have different preferences for structure. This is another way of saying that culture, working through fashion, is another factor that influences structural design.

The literature provides evidence for this too, for example, that certain European societies—such as the German—take better to bureaucracy than does the American, or that the Japanese place much heavier emphasis on indoctrination than do most other people.

In contemporary American culture, we see quite different trends in structural fashion. Coming quickly into vogue, close behind the divisionalized form, is project structure, what Bennis and Slater (1964) and then Toffler (1970) have called "ad-hocracy"—in essence, selectively decentralized organic structure that makes heavy use of the liaison devices. One can hardly pick up a management journal without reading about task forces, integrating managers, matrix structure. Clearly, this structure corresponds well to the calls for the destruction of bureaucracy, to the democratic norms prevalent in American society, and to its increasingly better-educated work force. But although this may be the structure of our age—well-suited to new, "future-shocked" industries such as aerospace and think-tank consulting—it may be wholly inappropriate for most older industries. It, too, is no panacea. Like all the structures before it, themselves once fashionable, it suits some organizations and not others. It is to be hoped that those others will not opt for project structure, as did one of Lawrence and Lorsch's container firms, just because it is fashionable.

To conclude our discussion of the situational factors, we note that different ones tend to affect the structure at different levels, although a

[12] In fact, there is reason to argue that the real fashion was the strategy of diversification; divisionalization then became the appropriate structural response.

number can affect the same design parameter (as in the case of formalization of behavior, which is affected by age, size, technical system, environmental stability, and culture). The factors of age and size, although significant at all levels, seem most pronounced in the middle of the structure; that is where, by creating changes in the favored mechanism of coordination, they produce extensive structural elaboration. The technical system, being housed in the operating core, clearly has its greatest effect there. But it has important selective effects elsewhere as well—for example, at middle levels requiring an extensive support staff when it is sophisticated. The environmental factors seem to have exactly the opposite effect from the technical-system ones. It is the managers and staff specialists at and near the strategic apex, those who must function continuously at the organization's boundaries, who are most affected by the environmental dimensions. These dimensions also importantly affect the structure in the middle, but have only a selective effect on the operating core, which the rest of the structure in fact tries to seal off from direct environmental influence. Finally, the power factors seem to cut across all levels of the structure, but only on a selective basis. External control, member needs for power, fashion, and culture sometimes modify the structures that would otherwise result from consideration of only the factors of age, size, technical system, and environment.

7

DESIGN AS CONFIGURATION

Throughout this book, ever since the introduction of the five coordinating mechanisms in its first pages, we have seen growing convergences in its findings. For example, the standardization of work processes was seen in Chapter 1 to relate most closely to the view of the organization as a system of regulated flows. Then in Chapter 2, we saw these two linked up to the design parameter of behavior formalization in particular and the traditional kind of bureaucratic structure in general, where the operating work is highly specialized but unskilled. In the next chapter, we found that the operating units of such structures are large, and that they tend to be grouped by function, as do the units above them in the middle line. In Chapter 5, there emerged the conclusion that decentralization in these structures tends to be of the limited horizontal type, where power resides primarily at the strategic apex and secondarily in the technostructure that formalizes everyone else's work. Then in the last chapter, we found that this combination of the design parameters is most likely to appear in larger and mature organizations, specifically in their second stage of development; in organizations that use mass production technical systems, regulating but not automated; in organizations operating in simple, stable environments; and in those subject to external control. Other such convergences appeared in our findings. In effect, **the elements of our study—the coordinating mechanisms, design parameters, and situational factors—all seem to fall into natural clusters, or configurations.**

It will be recalled that in our discussion of the effective structuring of organizations in the last chapter, two hypotheses were put forward. The congruence hypothesis, which postulates that effective organizations select their design parameters to fit their situation, was the subject of that chapter. Now we take up the configuration hypothesis, which postulates that effective organizations achieve an internal consistency among their