

8

ORGANIZATIONAL DESIGN

After studying this Chapter, you should be able to:

- A Identify the five basic elements of organizational structure.
- A Discuss the six criteria managers can use to group jobs and activities.
- A Describe the factors that influence managerial span of control.
- A Identify four ways activities can be coordinated in an organization.
- A Identify and discuss the strengths and weaknesses of the functional, divisional, hybrid, and matrix designs.
- A Describe and discuss how environment, strategy, size, and technology influence an organization's design.

What do General Motors, Textron, Inc., Digital Equipment Corporation/American Can Corporation, and Texas Instruments have in common? Like many other major U.S. corporations, these companies underwent a substantial restructuring during the 1980s. Restructuring is the "current buzzword, which has swept U.S. industry, (and) involves taking companies apart and putting them together again in different forms."¹

Managers may elect to restructure their organization for a variety of reasons. Current structures may be seen as contributing to inefficiency and related problems. Managers, faced with the prospects of more aggressive competition in the future, may seek to change the organization's structure now to be better equipped to meet the entrance of potential rivals. Or, management may see the current structures as incompatible with projections of future growth and goals and therefore restructure the organization in anticipation of meeting those needs.

ORGANIZATIONAL STRUCTURE

All organizations arrange their activities around structures. We will first define an organizational structure and then identify its basic elements.

Defining Organizational Structure

The concept of structure is generally simple and has application to many scientific and applied disciplines. Physiologists, for example, con-

I. G. Slutsker, "Some Call It Restructuring,"¹ *Forbes*, (September 16, 1985), 40.

sider the skeletal framework as a basic structure of the human body, Similarly, organizational structure can be defined broadly as mechanisms that serve to coordinate and control activities of organizational members. By coordinate, we refer to the process by which tasks and departments are interrelated in order to achieve organizational goals. Control refers to the regulation of activities in a manner that will enable members to predict and stabilize relationships within the organization. Both coordinative and control mechanisms, or structures, must be matched to the organization's context in order for the organization to be effective.

What are the mechanisms that managers use to structure their organization in order to coordinate and control activities? There are five general mechanisms that serve these functions. We refer to them as the basic elements of organizational structure.

Basic Elements of Organizational Structure

Managers make decisions about the structure of their organization when they address issues regarding the ways in which activities will be coordinated and controlled in the organization. Structural decisions that address issues of coordination and control evolve from consideration for the degree of work specialization, the manner of departmentation, the pattern of authority, span of control, and mechanisms of activity coordination.

Work Specialization. **Work specialization** refers to the manner in which labor is divided in the organization. Managers must decide the degree to which tasks are to be divided in the organization. From Chapter 1, we can recall Adam Smith's observation that greater specialization would oftentimes lead to greater productivity. Smith observed that one individual working alone could produce only 20 pins a day. However, if the work was divided into 10 specialized tasks, the equivalent of 4800 pins could be produced a day for each of the 10 individuals.

Managers may decide to have work specialized to a high degree or a low degree in their organization. When work specialization is to a high degree, we find individuals focusing on one or a few tasks. When work specialization is to a low degree, we find individuals performing many different tasks in the organization. The degree of work specialization in an organization can vary both within and across industries. For instance, managers of an automobile company may elect to have a high degree of work specialization on the production line, in this instance, we may find workers whose sole task is to rivet the bolts that hold the left passenger door to the frame of the car. Other workers may then attach the window handles to the door, while others install the door lock mechanism. Indeed, in a highly specialized automobile assembly line, one will find thousands of workers assigned to specific tasks that lead to the production of an automobile. On the other hand, managers of an automobile company may elect to specialize work to a low degree. Here, workers may

When there is a high degree of work specialization, workers focus on one or a few tasks.



operate as a team of eight who "walk" the car down the assembly line, each performing a wide variety of tasks depending on the stage of completion of the automobile.

Work specialization is not, however, confined only to tasks directly related to the production of a good or service. Managerial activities may also be divided into high or low work specialization. A manager who hires and fires personnel, keeps financial records, contacts suppliers to purchase raw materials, and travels to sell the organization's products is operating in a situation of low work specialization. Assigning a manager to perform each of these tasks separately would lead the organization to higher degrees of work specialization at the managerial level.

Work specialization is an important structural mechanism that managers can use in their efforts to coordinate and control member activities. Increasing work specialization enables managers to achieve greater levels of control over tasks. In highly specialized work, an individual can learn the necessary methods quickly, and managers can observe the activity to make sure the task is being performed correctly. Increased work specialization, however, can make coordination of activities more difficult. An individual performing five separate tasks is able to coordinate the various activities as that person has a better understanding of what tasks have been accomplished and what tasks have to be completed in the future. If five individuals are performing each task separately, then the activities must be coordinated to make sure each person completes the task at the appropriate time. Hence, managers must recognize that work specialization can solve problems of control but increase problems of coordination. The issues surrounding work specialization will be discussed further in Chapter 9.

Departmentation. Another basic element of organizational structure is departmentation. **Departmentation** is the grouping of jobs based on criteria that managers believe contribute to the coordination and control of activities. The six criteria for grouping jobs may include the following:

- A *Knowledge and skills.* Positions are grouped according to the specialized knowledge and skills that members bring to the job. For example, universities assign professors to departments such as chemistry, business, and engineering that have been created based on the grouping of knowledge and skills.
- A *Work process and function.* Positions are grouped according to the process or activities to be performed. This is perhaps the most commonly recognized method of grouping in business organizations which establish departments such as production, marketing, research and development, engineering, and finance.
- A *Time.* Grouping of positions is based on the criterion of when the work is to be done. The organization may, for instance, perform identical work 24 hours a day as may occur in food processing. Members are then grouped into three shifts based on a time criterion. Time may also serve as a basis of grouping when work varies within a 24-hour period. Telephone operations vary by weekday, weekend, evening, and late night; thus, different work skills may be required.
- A *Product.* Positions in the organization are grouped on the basis of the good or service that is being produced. A computer manufacturer may assign employees to departments designated by office computers, home computers, or scientific computers.
- A *Customer.* Groups may be formed based on the need to deal with different types of customers. A television production company may have groups formed to handle programming for children, teenagers, and adults.
- A *Location.* Positions may be grouped by location, as in situations where the organization operates in different geographical regions. Thus, one may find the Midwest division, the west division, and the international division, which have been¹, formed based on a defined area of operation.²

The choice of criteria by which managers choose to group positions in an organization is critical. Implications of grouping will be discussed later in the chapter when we examine organizational designs. For now,, we need to recognize that a decision for grouping based on one of the six criteria listed is important, because it defines both the tasks to be corn-

2. H. Mintzberg, *The Structuring of Organization?* [Englewood Cliffs, NJ: Prentice-Hall, 1979], 108-110.

bined into one department and the members who belong to that group.

A hospital administrator, for instance, may make a decision about departmentation that can have a wide range of implications for the way the hospital assigns authority, allocates resources, rewards performance, and establishes communication, as well as implications for the goods and services it provides to patients. Figure 8-1 provides six hypothetical groupings that could be applied to a hospital.

Grouping has four fundamental implications for employees and the manner in which organisational activities are carried out:

- A *Grouping establishes a system of common supervision.* Once jobs have been assigned to a department, a manager can be named to coordinate and control the activities within the department.
- A *Grouping typically requires a sharing of common resources.* Budgets, facilities, and equipment that are necessary to complete activities can be assigned to the department.
- A *Grouping typically creates common measures of performance.* Joint sharing of resource inputs and joint responsibility for out-

Figure 8-1 SIX HYPOTHETICAL GROUPINGS OF A HOSPITAL

KNOWLEDGE AND SKILLS:

Physicians ----- Nurses Lab Technicians

WORK PROCESS AND FUNCTION:

Admittance ----- Diagnosis Treatment

TIME:

8:00a.m.-4:00p.m. 4:00 p.m.-12:00 p.m. ----- 12:00p.m.-8:00a.m.

PRODUCT:

Cardiology: m "Ear, Nose, & Throat Internal Medicine¹

CUSTOMER:

women's Health Geriatrics

LOCATION: ¹

downtown Suburbs GEMJ, Bty

puts allow for the members of the department to be measured on common performance criteria. Recognition of joint performance measures encourages members to coordinate their activities to be effective.

A *Grouping encourages communication.* Departmentation and sharing of common facilities usually bring employees into close proximity. This closeness encourages frequent communication among employees, enabling them to coordinate their tasks more effectively.³

Pattern of Authority. Decision-making authority is the right of a member to make decisions without having to obtain approval from another member in the organization. We will discuss authority in greater detail in Chapter 14. A pattern of authority becomes established in an organization when authority is distributed to all positions in the organization. The distribution of authority through positions can be patterned into a centralized or decentralized structure.

Centralized authority in an organization would exist where decision making is retained by higher level managers. **Decentralized authority** would exist where decision making has been granted to middle and lower level positions in an organization. In this respect, organizations can pattern their authority along a continuum with centralization at one end and decentralization at the other end.

Let us consider how managers of an organisation may elect to have a centralized or decentralized structure. Suppose you have just purchased a small store that sells premium wines obtained worldwide. Six positions exist in the store: store manager, purchaser, stockperson, cashier, custodian, and accountant. You may decide to pattern authority in the store using a centralized structure. To do so, you announce that the purchaser, stockperson, cashier, custodian, and accountant must receive approval from the store manager for any decisions made. This may mean that the purchaser cannot close a deal to buy cases of vintage wine without first receiving approval from the manager. The stockperson would not be allowed to open cases of wine and shelve bottles until the manager makes the decision to do so. The cashier is restricted from cashing checks without the manager's signature; the custodian must schedule repairs and cleaning at the request of the manager; and the accountant is unable to make payments without the manager's signature on the checks. Obviously, in this situation the store manager will be highly involved in the day-to-day operations of the store!

On the other hand, you may elect to decentralize the pattern of authority in the store. In this case, the store manager would grant greater decision authority to the other positions. The purchaser may be granted authority to close a deal on a wine purchase without prior approval from

A. *Ibid.*, 10K.

the manager; the stockperson would have the authority to decide when wine is to be shelved; and so on. By decentralizing, the store manager is removed from the day-to-day decisions of each position and is allowed more time to monitor the environment and plan activities for the future. The choice to centralize or decentralize decision making on the part of a manager is discussed further in Chapter 14.

No organization is ever completely centralized or decentralized. Rather, organizations resemble one end of the authority continuum more than the other. For instance, the manager of the wine store would probably apply conditions to the decision-making capabilities of the subordinate positions. Restricting purchases over \$10,000 without the prior approval of the store manager, requiring check-cashing approval for customer purchases over \$25, and so forth, are techniques used by managers to avoid relinquishing total control.

When should an organization centralize and when should it decentralize? This structural decision is based on a number of factors: the nature of the environment, the decision style of top managers, the type of strategy that the firm pursues, the skills and experience of lower managers, and the extent of boundary-spanning personnel in the organization are all factors that contribute to the pattern of an organization's authority structure. Situation 1 explains that Eastman Kodak chose to decentralize its research and development operations to achieve compatibility with technology and strategy. Later in this chapter, we will discuss specific contingencies and how they influence the authority structure in an organization.

SITUATION 1

Eastman Kodak to Decentralize Research Operations

Eastman Kodak Co. said it will decentralize its research and development efforts to match specific technologies with business strategies. Under the reorganization, Kodak said it will divide operations of its research laboratories in Rochester and San Diego into six research centers. The research centers will be attached to separate business groups within the photographic and information management division. A seventh laboratory will be used for long-term research in new technologies, mainly unrelated to current products.

Source: Reprinted by permission of *The Wall Street Journal*, © Dow Jones & Company, Inc. (February 28, 1986). All Rights Reserved.

Span of Control. **Span of control** is the number of subordinates reporting to a single supervisor. Narrow spans, or few subordinates reporting to a supervisor, allow for greater control over subordinate activ-

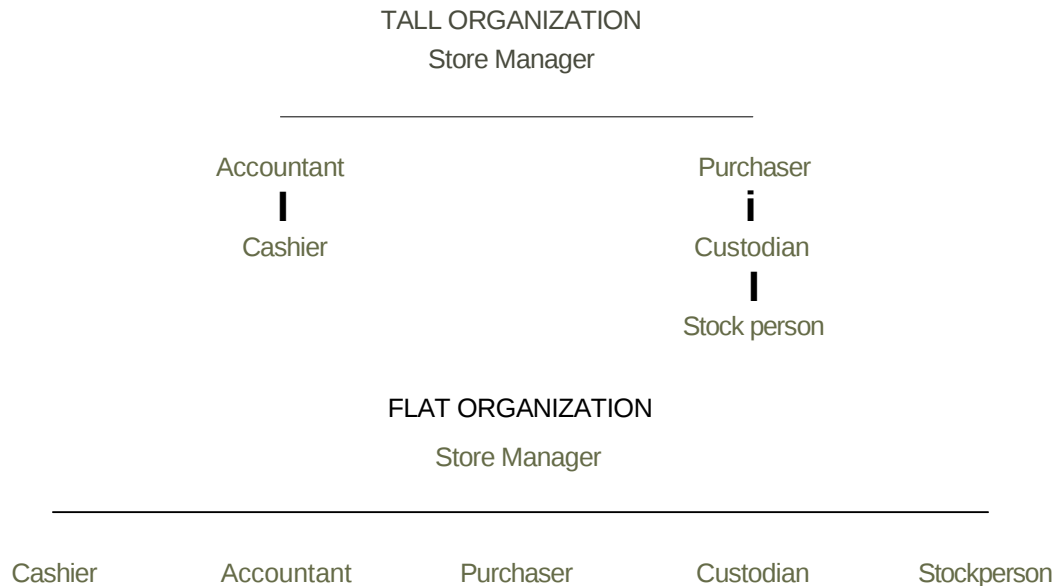
ities. Wide spans, or many subordinates reporting to a supervisor, make close supervision difficult. However, wide spans have the advantage of reducing costs by reducing the number of supervisory positions in the organization.

Figure 8-2 illustrates two approaches for structuring positions in the previously discussed wine store using wide and narrow spans of control. An organization that has narrow spans of control is referred to as a **tall organization** as it requires increased levels of management. In our example, we have the store manager at the top level who directly supervises the accountant and the purchaser. The accountant directly supervises the cashier, while the purchaser supervises the custodian, and the custodian supervises the stockperson. Hence, three levels of management have been established in a store with a total of six positions. A **flat** organization, however, has wider spans of control and thus fewer levels of management. Again, we can use our wine shop example and have the cashier, accountant, purchaser, custodian, and stockperson directly reporting to the store manager. Thus, only one level of management has been established: the store manager.

While the wine store provides an example of how the span of control can be adjusted and readily understood in a small firm, imagine structuring an organization based on the span of control that employs 1,000 or 10,000 or over 100,000, as many multinational corporations do! A decision to reduce or expand by one the span of control in a large company can

Figure 8-2

TWO APPROACHES FOR STRUCTURING SPAN OF CONTROL IN A WINE SHOP



have an enormous impact on organizational costs as well as the control of activities!. Situation 2 indicates a growing trend among many U.S. corporations to reduce costs through the elimination of middle management levels. This "flattening" of the organization will certainly reduce costs by way of savings on salaries and fringe benefits, but may lead to the increase of uncontrolled activities.

SITUATION 2

Middle Manager a Favorite Target of the Job-Cutter

A American Telephone & Telegraph is laying off 24,000 employees at its Information Systems group; nearly one-third of them are in management.

A Ford is committed to trimming its management by 9,000 over the next 5 years.

A Since 1983, Eastman Kodak has reduced its worldwide work force from 136,500 to 124,000 and is not adding to its management ranks.

These events, multiplied many times throughout American industry, demonstrate the new plight of middle managers. Middle managers, the staff people long thought essential to a smooth-running corporate operation, are becoming increasingly expendable because of the rapid increase in office automation and a new corporate emphasis on pushing decision making far down into the operations.

Nowadays, companies want managers who contribute directly to the value of the enterprise through research, product development, manufacturing, and sales. That shift spells trouble for managers whose expertise lies in administration or staff support. Quinn Mills, a Harvard Business School professor who consults for International Business Machines, General Motors, and Bethlehem Steel, says; "Companies simply can't afford to carry people who don't directly contribute to the bottom line. If they reorganize, they can push middle-management functions lower down into the work force and save a good deal of money."

The reason? "Many times, middle management and clerical groups are involved in work that doesn't add value to the product. In international competition, jobs that don't add value to the product are not needed," says Peter C. Van Hull of Arthur Andersen Co.

The idea is to renew a focus on the core elements of the enterprise—design, manufacture, and sales—and to eliminate the managerial redundancy that was once key in assuring that top management edicts were followed. Gone are the days of "checkers checking checkers checking checkers."

Source: Michael Schrage and Warren Brown. "Middle Manager a Favorite Target of the Job-Cutter," as published in *The Milwaukee Journal* (December 1, 1985). ■& *The Washington Post*.

Is there an optimum span of control? This question has been, of major concern to many managers and researchers. Classical theorists generally recommended a narrow span of control, contending that managers cannot effectively monitor the activities of more than six or seven subordinates at one time. V.A. Graicunas (1933) noted that managers must not only control activities of a subordinate in a direct one-to-one relationship, but also must control the relationships that are established among the subordinates themselves. As each subordinate is added to the group, the number of relationships to control grows geometrically and can easily exceed the manager's capabilities to control activities among subordinates effectively. This view has received additional support from George A. Miller (1956), suggesting that humans are unable to process information beyond the "magic number of seven, plus or minus one."

Other writers were to qualify a strict adherence to an optimum number of subordinates within a supervisor's span of control. Ralph C. Davis (1951), for instance, noted that the level of management will determine the number of subordinates a supervisor can handle effectively with wide spans of control possible among lower levels of management and narrow spans of control required among upper management.

The argument that an optimal or maximum span of control exists has been questioned by other management scholars. James Worthy (1950) found that Sears, Roebuck and Co. utilized a span of control of 40 or more that worked very effectively. Subordinates were found to have greater job satisfaction and to be more productive because of the greater job responsibility they accrued with looser controls. And J. M. Pfiffner and Y. Sherwood (1960) noted that in California, the Bank of America had over 600 branch managers reporting directly to corporate headquarters!

While no prescribed number can be assigned to all managers to optimize the span of control in the organization; eight factors can be identified that management should consider prior to the establishment of a span of control to a position. Those factors are as follows:⁴

- ▲ *Professionalism.* The more professional the subordinates are, the less supervision they will need. Professionals, such as scientists, professors, and doctors are generally regarded to have adequate training to make proper judgments and decisions regarding the performance of their tasks. They do not need close supervision, and they are unlikely to perform well under such conditions.
- ▲ *Task uncertainty.* If tasks performed by subordinates contain frequent and hard-to-solve problems, closer supervision may be required to assist the subordinate in coming up with solutions.

4. C. W. Barkdull, "Span of Control—A Method of Evaluation.." *Michigan Business Review* vol. 15, no. 3 [May 1963]; 17-19; and H. Stiglitz, *Organizational Planning* [New York: National Industrial Conference Board, 1966], 15.

If tasks are certain and contain infrequent and easy-to-solve problems, a wider span of control may be established.

- A *Training*. The more training subordinates have, the more they will be able to perform their work without close supervision. Training of superiors can have the same effect in that greater training allows for a wider span of control as the supervisor becomes more competent.
- A *Physical dispersion*. Supervisors may have subordinates located in one plant facility, or they may be scattered throughout the country. The more dispersed subordinates are, the narrower should be the span of control. With a wide span of control, an enormous amount of time would have to be spent in travel or coordination, thus reducing the time that can be applied directly to the supervision of subordinates.
- A *Required interaction*. The more interaction required between a superior and subordinate, the narrower should be the span of control. A manager supervising commodity traders on the floor of the Commodities Exchange should have a narrow span of control. Continual and constant interaction with the floor traders is required in order to manage buy-and-sell requests from customers. On the other hand, a subordinate whose job is to unclog bottles entering a conveyer belt on an assembly line requires little supervision and thus can be added easily to the manager's span of control.
- A *Similarity of tasks*. When tasks among subordinates are similar, a wider span of control for the supervisor can be established. When tasks among subordinates are dissimilar, the supervisor must be more attentive and aware of the different problems that will be encountered by subordinates,- thus, a narrower span of control must be established.
- A *Standardized procedures*. If uniform and specific procedures have been applied to the tasks performed by subordinates, the span of control can be wide. Standardized procedures enable the subordinate to solve existing problems or to take steps that will channel the problem to the appropriate individual or department. Hence, supervisors need not spend as much time working with subordinate problems.
- A *Task integration*. When the tasks of subordinates require integration, A narrower span of control may be necessary. Integration of tasks places a greater burden on the supervisor who must reserve time to make judgments about the quality of the tasks being performed and the way tasks are linked together.

These factors suggest the complex nature of deciding on an appropriate span of control for managers in an organization. Some factors may be contradictory when taken together, as in the case of the supervision of professionals [wide spans], who may be performing similar tasks (narrow

spans). Under these circumstances, managers must assess the relative importance of each factor and decide on a span of control that will fit the situation.

Coordination of Activities. The final structure that serves as a building block of organizations is the coordination of activities. **Coordination** is the linking of activities in the organization that serve to achieve a common goal or objective. As task activities are divided in the organization, managers must attempt to develop mechanisms that will link the tasks together in order for the desired goal to be accomplished. The result of such a linking of activities is the creation of various forms of activity interdependence. The degree to which activities are interdependent can vary from low to high. The four configurations of activity interdependence are pooled, sequential, reciprocal, and team.⁵ The type of interdependence among activities performed in an organization will largely determine the appropriate coordinative mechanisms. Figure 8-3 diagrams each type of interdependence and the kinds of coordinative mechanisms that are associated with each.

Pooled Interdependence. **Pooled interdependence** exists where there is minimal direct contact between individuals or groups performing an activity. Work does not flow between activities; rather, the results of activities are "pooled." at a higher level in the organization. Each member of a planning staff may be individually assigned the task of investigating and preparing a forecast on a specific domain of the organization's environment. After each member has performed the task, the forecasts are submitted to the executive vice-president of strategic planning, who has the task of integrating the material from each report into a broader, long-range plan. Other examples of pooled interdependence exist for franchisees, such as with McDonald's outlets. Each outlet performs its tasks independently from other outlets but contributes or pools some revenues to corporate headquarters to pay for national advertising.

Coordination is most readily achieved through standardization such as the drafting of rules and regulations, imposing direct supervision, and creating training programs. Rules and regulations serve as guidelines for the same activity performed separately. Thus, the vice-president of strategic planning can establish the rule that each report is due on the¹ 15th of the month, that a 10-year time frame is to be used in the analysis, and that forecasts will assume a prime rate of 10 percent. McDonald's is noted for having extensive rules and regulations governing the operations of each franchise. This enables the parent organization to coordinate national advertising for products and services that apply to all locations.

5- J. D. Thompson, *Organizations in Action* (New York: McGraw-Hill Book Co., 1967), 51-65; and A. H. Van tie Veil, A. L. Delbecq, and R. Koenig, Tr., "Determinants of Coordination Modes within Organizations," *American Sociological Review* 41 [1976]: 338.

f

1NTEBDEPENDENCE AJSJJ> tTS (fcELAtitfONSHn* TO GLOOKDINATION

Form of Interdependence

Coordination
Mechanism

Coordination
Mechanism

POOLED INTERDEPENDENCE

Form of Interdependence

SEQUENTIAL INTERDEPENDENCE

Standardization,
Rules, Procedures

Plans,
Schedules

n



Output

Input



Input

Input

Input

Output

RECIPROCAL INTERDEPENDENCE

Input Output Input Output

TEAM INTERDEPENDENCE

Input Output Input Output

n
z



Mutual Adjustment,
Group Meetings

Teamwork,
Impromptu Sessions



Input Output

Input Output

Sequential Interdependence. A greater degree of interdependence is referred to as sequential interdependence and exists when the output of one activity becomes the input of another activity. This form of interdependence describes a typical assembly line where a worker may install the axle on an automobile and then the next worker places the wheel rim on the axle. Sequential interdependence can also operate at the plant level where one plant manufactures the axle and wheel rim and ships them to another plant for assembly. In either case, the activity of one worker or plant cannot be conducted until another worker or plant has completed its activity.

Coordination in sequential interdependence is attained through standardization with emphasis on the use of plans and schedules. Setting deadlines, establishing performance targets, and identifying linkages between activities are all critical managerial decisions which must be made before members or units engage in the work process. Sequential interdependence, therefore, requires managers to spend time planning in order to achieve an effective level of coordination.

Reciprocal Interdependence. When units provide each other with activity inputs, reciprocal interdependence exists. For example, a legal department in a savings and loan may review applications from borrowers that were submitted to the loan department. After an application has been reviewed and changed, it is sent back to the loan department so that the request or denial of the loan can be processed. The output of the loan department becomes the input for the legal department and the output of the legal department becomes the input of the loan department. There is a two-way flow between departments.

In order to coordinate the activities of units engaged in reciprocal interdependence, mutual adjustment is required in addition to standardization of plans and schedules. Mutual adjustment is the process of direct communication and joint decision making among the members or units involved in the task activities. While rules and regulations, direct supervision, training, planning, and scheduling help to facilitate coordination among units with reciprocal interdependence, not all of the problems that result from high levels of interaction between units can be anticipated. Hence, it is important that the linkages between activities are continually adjusted through direct communication in order to facilitate effective task completion.

Team Interdependence. The most intense form of interdependence results when the completion of activities requires teamwork. Team interdependence exists when work is interactive, or acted on jointly by members of different groups or units rather than simply being transferred back and forth. Team interdependence is most commonly used when an activity cannot be broken down easily into distinct tasks because there is uncertainty over what tasks have to be performed in order to accomplish the goal. Basic research in space exploration, cancer research, and new

product development oftentimes requires the use of team interdependence.

Teamwork is the most important method of coordination in team interdependence. Teamwork, in addition to standardization, plans, and mutual adjustment, requires direct contact among activity participants. This can be accomplished through regularly scheduled meetings, impromptu sessions, and informal get-togethers. Physical separation of participants, therefore, makes coordination through teamwork difficult to accomplish.

DESIGNS OF ORGANIZATIONS

Organizational structures provide the basic building blocks for the overall design of an organization. Managers can combine various structures to erect an organizational design that they believe will enhance the accomplishment of goals. First, we will identify four designs that are most frequently used by managers for structuring their organizations. It is important to recognize that each design only serves as a blueprint for managers. Much like building construction crews modify blueprints to conform with land and weather conditions, managers will be required to make modifications in the design of their organization in order to accommodate specific or unusual needs. In the last section of this chapter, we will identify several important contextual factors that influence a manager's choice of an organisational design. But first, let us examine the four basic organizational designs: functional, divisional, hybrid, and matrix.

Functional Design

Functional design is the most basic organizational form wherein employees are grouped together according to similar tasks, skills, or activities. The idea behind a functional design is to group employees who perform similar tasks in one department of the organization. Thus, as depicted in Figure 8-4, all sales personnel are located in the marketing department; all engineers are located in the research and development department; all members trained in accounting are situated in the accounting department, and so on. The grouping of tasks or skills into one department enables the assignment of one senior manager to whom all members of the department report. In many organizations, this position is labeled vice-president.

Functional designs are most common in small- to medium-sized organizations, because they work best when there are few products and there is a need for a high level of work specialization. The functional design tends to centralize decision making at the top of the organization. Decisions about the coordination of activities across departments must

Figure 8-4 **FUNCTIONAL DESIGN**

be made at the top of the organization. Top management also serves as an arbitrator for problems that are the result of interaction between departments. Spans of control within departments are usually wide as supervisors have extensive knowledge about the tasks subordinates have to perform due to common knowledge and expertise.

functional designs of organizations have a variety of strengths and weaknesses.⁶ Several important strengths of the functional design are as follows:

- A *Efficient use of resources.* By grouping common tasks together, economies of scale are possible. Each department is able to serve other departments efficiently by mobilizing problem-solving expertise quickly. Resources are further utilized efficiently by having members who share common facilities or machinery in one place.
- ▲ *In-depth skill development.* More intensive training of members is possible within departments due to the similarity of knowledge and prior skill development. Members have opportunities to specialize their skill to a greater extent by sharing information with colleagues in the department.
- ▲ *Clear career paths.* Employees have a clear understanding of job requirements and the path that will lead to promotion. By observing colleagues with similar backgrounds and expertise, an employee will learn quickly which activities are desired by the organization and which are not.
- A *Strategic decisions made at the top.* A centralized decision-making structure facilitates a unity of direction as top management provides coordination and control to the organization. Departments can be provided with goals and objectives that will support the overall strategy of the organization.

6. R. Duncan, "What Is the Right Organization Structure? Decision Tree Analysis Provides the Answer," *Organizational Dynamics* [Winter 1979], 59-80.

- A *Enhanced coordination within functions.* Common backgrounds of members within a department facilitate communication and enhance collegiality. This in turn facilitates the coordination process as members of the department are more likely to work as a team to accomplish the department's goals.

Weaknesses of the functional design include the following:

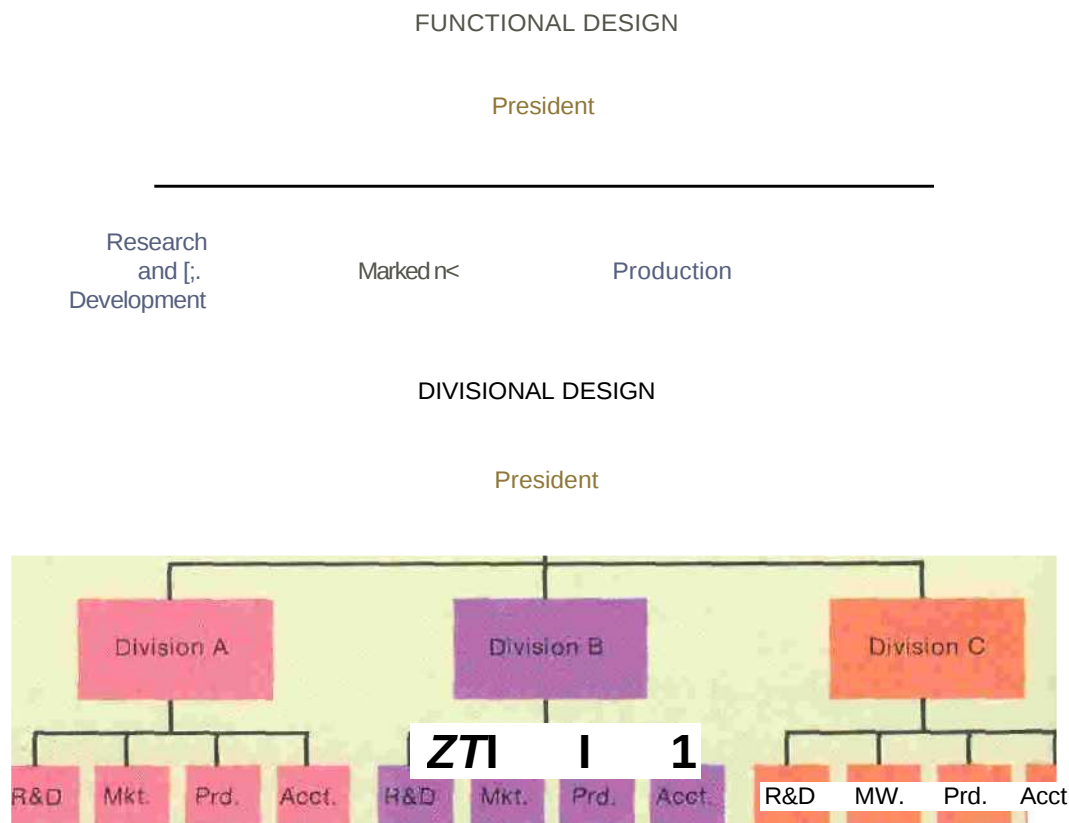
- ▲ *Slow decision making.* With decision making located at the top, senior managers may have an overload of decisions should multiple problems emerge in departments. As a result, decisions may be slowed or of lower quality, causing delays and additional problems in the organization.
- A *Less innovative.* Members of a department become focused only on departmental goals rather than on the overall goals of the organization. Ideas for new product ideas, implementation of new technology, or suggestions for new methods of solving problems often get lost because of the need to communicate or to generate support across departments.
- ▲ *Performance responsibility unclear.* The successes and failures of an organization are an outcome of activities by all departments. Production, marketing, finance, and research and development, among other departments, each contribute to the accomplishment of an organizational goal. However, the contribution of each department to the success or failure of a goal is not easily understood.
- A *Limited management training.* While functional departments excel at training members to solve problems related to specific skills, they do poorly at training members to solve problems concerning the larger organization. Top management is required to have an understanding of how departments can be linked together effectively. Extensive training and experience in one department reduce the opportunity for developing broader management skills.
- A *Poor coordination across functions.* Members of each department may feel isolated and even hostile toward those in other departments. This can result in members having an unwillingness to support or compromise with other departments in order to achieve organizational goals.

Divisional Design

Generally, as organizations grow in size, the weaknesses of a functional design begin to offset the strengths. This is particularly true when the growth of the organization is accompanied by an expanded product line, more customers, or geographic expansion. When this occurs, top

management can create self-contained units, or divisions, that will design, produce, and market its own products. A divisional design means that all activities needed to produce a good or service are grouped together into an autonomous unit. Divisional designs can be distinguished from functional designs by the emphasis on grouping by organizational output. Functional designs are based on grouping by input, such as the tasks, skills, and knowledge that will be required to perform an activity. The divisional design considers the output such as the product, customer, or location. Thus, for each output, a self-contained unit is composed of marketing, finance, and production. The divisional design serves to maximize coordination around a specific output. A firm that manufactures farm equipment and recreation vehicles, for example, does not have to assign both products to one production department. Figure 8-5 shows how a functional design can be changed into a divisional design.

Figure 8-5 **CHANGING A FUNCTIONAL DESIGN TO A DIVISIONAL DESIGN**



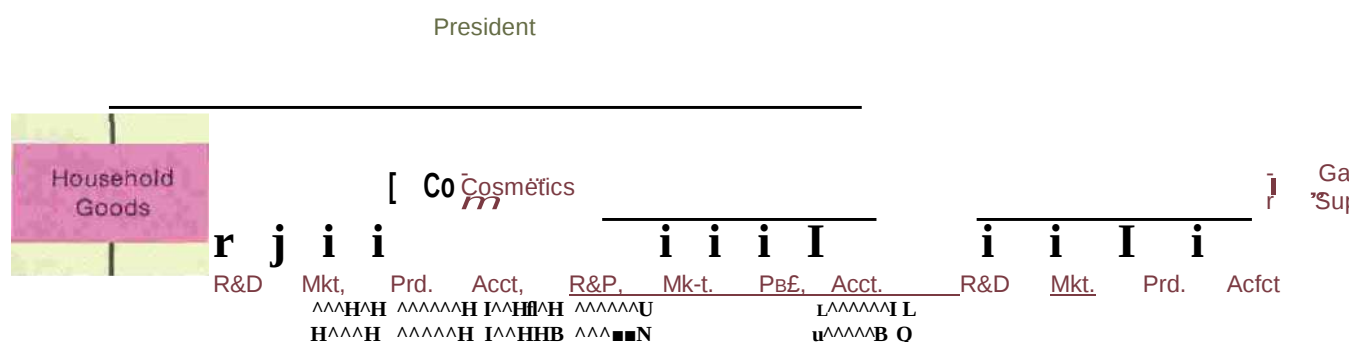
The three patterns of a divisional design are as follows:

- A *Product division*. In **product division**, each unit is responsible for a single product or a group of related products. Division by product is usually created when a product or group of products has a production process and marketing method that are different from those of other types of products in the organization (see Figure 8-6).
- A *Customer division*. When the organization sells products to a diverse group of customers, **customer division** may be the appropriate design. A single product may have diverse customers, or managers may believe there are groups of customers with special needs that have to be met. By instituting a customer division, a close relationship can be established between a division and its customers. For instance, some computer firms have divisions for business, research, and home customers (see Figure 8-7).
- A *Geographic division*. Large organizations that distribute their output nationally or internationally often develop divisions based on geography. **Geographic division** is advantageous when it is necessary to locate facilities close to customers who may have differences in regional tastes and needs. By creating geographic divisions, the organization can facilitate coordination of activities within each region. Large retail grocery stores, for example, often create divisions by region. A manager in charge of the region can then coordinate the purchasing, warehousing, stocking, and advertising of food goods that are commonly purchased in each region (see Figure 8-8).

Figure 8-6

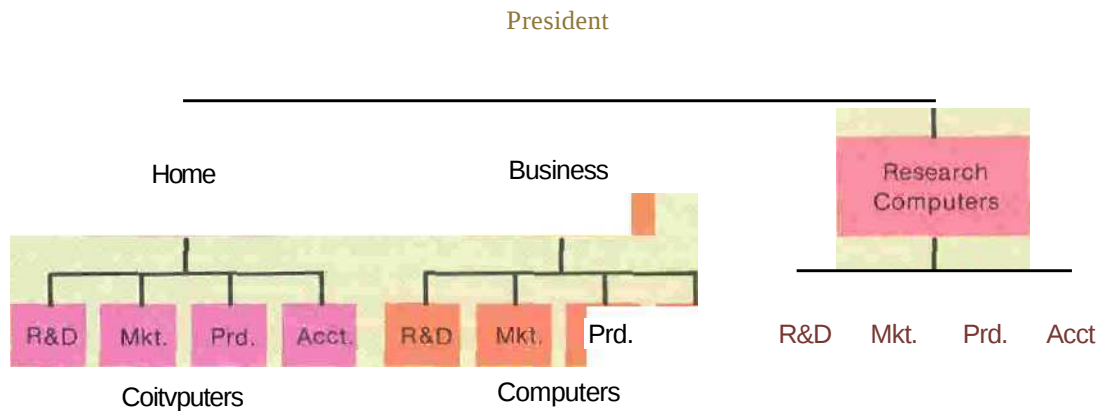
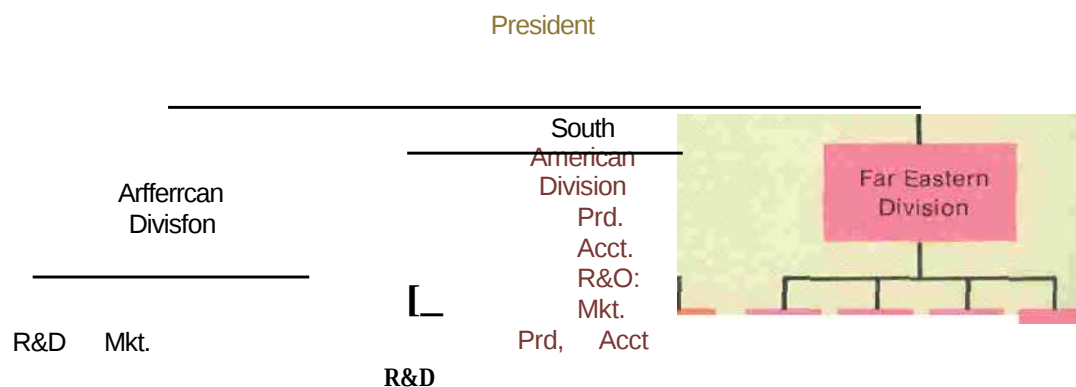
tavn1

DIVISIONAL DESIGN BASED ON PRODUCT DIVISIONS



luru

tf-7

DIVISIONAL DESIGN BASED ON**DIVISIONAL DESIGN BASED ON GEOGRAPHIC DIVISIONS**

Divisional designs have several implications for organizational structures. They tend to make decision making more decentralized by pushing authority and responsibility down to the level of division or unit manager. Since divisions are based on unique output traits, managers at this level are more prepared to respond to problems than top management would be. Work can be specialized by output, and the span of control is reduced for department heads. Finally, coordination for the overall organization is achieved through pooling as each division operates autonomously from other divisions. Coordination is achieved through each division's contribution to the corporation.

The strengths of a divisional design are as follows:^{3*}"

- A *Adaptation to unstable environment.* Since each division is relatively small, it can adapt more readily to changes in product developments, customers, or regions. The decision to change a rule, for instance, does not have to be applied across all divisions, but can be made by the divisional manager and applied to a single division. Divisional managers are closer to the action and thus can respond more quickly to changes in the environment.
- ▲ *High customer satisfaction.* Customers receive more attention under a divisional design because there is greater tailoring of the product to customers' needs and wants. Customers can easily relate ideas as well as express complaints about the product.
- A *High task coordination.* Employees tend to identify more with the product than with the specific department to which they are assigned within the division. As a result, there is more communication and teamwork across departments in the division.
- A *Clear performance responsibility.* Each division can be made a profit center, thus permitting assignment of specific objectives to be met. Top management can assess the performance of each division separately to determine where success and failure have occurred.
- A *General management training.* Divisional managers learn how to coordinate and control activities among several departments within a division. In addition, managers can be shifted to different divisions to learn the various product lines of the organization as well as the various methods of operations that exist. This provides strong experience for top management training.

The weaknesses associated with a divisional design include the following:

- A *Inefficient use of resources.* One major problem of a divisional design is the dispersion of resources across divisions. In the functional design, for example, a sales force of 20 employees may be satisfactory for selling 5 products. Sales personnel can shift readily from one product to another depending on supply and demand. A divisional design would mean that four salespeople would have to be assigned to each of the five product divisions. However, some products may have cyclical demand, requiring eight sales personnel during the summer and two during the winter. The division would then be faced with either hiring eight full-time sales people or requesting transfers from

7. *Bid.*

other divisions. Either way, the costs associated with extra personnel or additional training and moving costs would be higher. A *Low in-depth training*. A decrease in the number of personnel reduces the opportunity for members of the division to specialize. Rather, they must focus on the more basic skills that are required to produce and deliver a product. In addition, there are fewer members in the division with common backgrounds and skills with whom one can interact,

- ▲ *Focus on division objectives*. Coordination across divisions is often difficult. Members of a division become focused on the unit's objectives rather than on the broader goals of the organization. Many times, this results in direct competition between divisions. For example, a company with a detergent division and a paper towel division may have a situation where the detergent salesperson has to convince a grocery store manager to remove the company's paper towels from the shelves to make room for a broader line of detergent.
- ▲ *Loss of control*. Top management may find that divisions have become radically different and thus is unable to impose rules and regulations or plans and schedules across all divisions. Hence, the overall goals of the organization may be difficult to achieve.

Hybrid Design

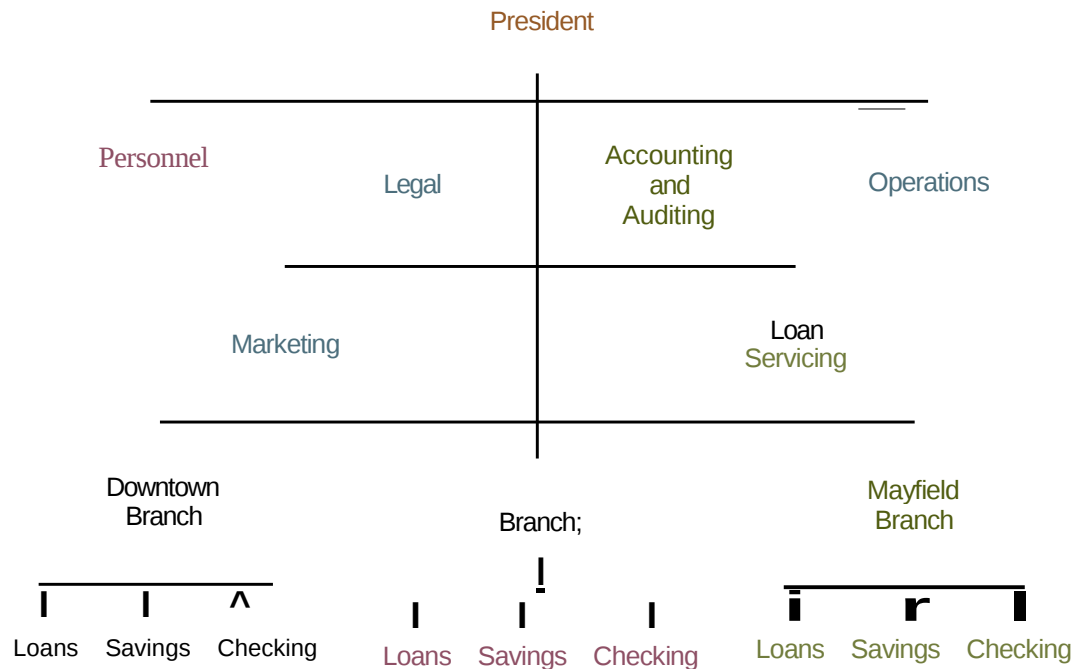
In some instances, managers may find that a purely functional or divisional design is not appropriate for their organization. In practice, many corporations have attempted to include elements of both functional and divisional designs in an effort to reduce weaknesses and achieve strengths. A **hybrid design** is one that has divisional units but also has functional departments centralized and located at corporate headquarters. * For example, a company may elect to have the personnel department located at headquarters. The personnel department would service the various divisions of the company by providing applicant screening, employee training, and maintenance of employee files for all divisions of the company. In so doing, the organization is able to eliminate the need for an entire personnel staff in each product division, thereby saving considerable costs. The hybrid design works best when each division of the organization has a department that is similar to those of all other divisions.

Banks are examples of organizations that frequently use hybrid designs, as depicted in Figure 8-9. Each branch operates as a geographic

8. S. A. Allen, "Organizational Choices and General Management Influence Networks in Divisionalized Companies/" *Academy of Management Journal* 21 (1978): 341-65;



A COMMERCIAL BANK AS A HYBRID DESIGN



division with the centralized functional departments of personnel, legal, accounting and auditing, operations, marketing, and loan servicing. Personnel provides hiring and training services for each branch. Legal problems are channeled to the corporate office, which reduces the number of lawyers that have to be hired. Accounting and auditing assists each branch in the compilation of its financial performance. Operations provides a central location for storing customer information and accounts. Advertising, such as notifying consumers of interest rates, can be coordinated through one centralized marketing department. This means large savings of time and money since each branch will have the same interest lending rates, and managers of the branch do not have to contract independently with advertising sources. Finally, loan servicing located at company headquarters prevents wide differences in lending requirements across branches.

The strengths of the hybrid design include the following;

- A *Simultaneous coordination.* Coordination across and within divisions can be achieved with a hybrid structure. Centralized

functions enable coordination across divisions by establishing activities that direct each division toward a common purpose. Coordination is achieved within each division by locating functions together.

- A *Integration of goals with objectives.* The hybrid structure provides autonomy for divisions to modify their objectives based on unique situations or circumstances. However, the centralized functions serve to generate awareness of the overall corporate goals among divisions.
- A *Adaptability and efficiency.* The divisional units are able to adapt to the opportunities and constraints of their environment. The functional units are able to focus on efficiency of operations. Thus, the hybrid structure is able to attain both adaptability and efficiency within one structural design.

The weaknesses of the hybrid design are as follows:

- A *Slow response to exceptional situations.* When a division confronts a situation that is unique, resolution must be obtained from headquarters. This can result in delays and inefficiencies as the division may be better equipped to handle the case.
- ▲ *Conflict between headquarters and divisions.* Functional departments at headquarters often do not have supervisory authority over divisions, yet they often try to influence divisional activities. Sometimes, different functional departments may place contradictory limitations on decisions.
- A *Administrative overhead.* Functional departments at headquarters have a tendency to grow as staff are added to assist in the control of divisions. This can lead to excessive cost and duplication and result in bottlenecks in decision making.

Matrix Design

Most organizations resemble functional, divisional, or hybrid structural designs. However, not all managers believe that these designs satisfy the needs of their organization. A functional design promotes technical expertise while sacrificing efficient coordination across departments in the production of goods. A divisional design allows for the development of multiple products, but technical expertise may be underdeveloped. The hybrid design enables managers to establish some departments as functional to encourage technical expertise, while creating divisional departments to achieve coordination in the production of goods. Managers may, however, need an organizational design that generates technical expertise and product coordination simultaneously in order to achieve their goals effectively.

The matrix design may be the solution for managers who believe that other designs are inadequate. The matrix design is unique because it implements functional and divisional structures simultaneously in each department as shown in Figure 8-10. The result is a system characterized by employees in each department being supervised by two bosses—or a system of dual authority. One boss is the functional manager while the other boss is the divisional manager. The functional manager and the divisional manager have equal authority within the organization. However, the functional manager is responsible for the work performed by specialists from the functional department. The divisional manager, or project manager, is responsible for integrating the activities of the specialists across functional departments in order for the project to be completed. Hence, the processes of control and coordination are assigned to separate managers in the organization.

The matrix design is a more complicated structural arrangement than are functional, divisional, or hybrid designs. Because of this complication, managers should consider instituting the matrix design only when the following conditions exist:¹⁷

- A *Environmental pressures exist for a dual focus.* Competition, regulatory requirements, or consumer demand may require the organization to provide not only multiple and innovative products, but also products of high technical quality. This dual pressure requires that both product and technical quality be attended to equally in the organization as reflected by the dual authority structure.
- A *Large amounts of information must be processed.* An unstable and complex environment often requires processing information that is extensive and rapidly changing. Separation of task responsibilities by product and technical expertise allows information to be disseminated more quickly throughout the organization.
- A *Efficiency is needed in the use of resources.* The organization does not have the capabilities to allocate separate facilities and personnel to each product, thus a sharing of resources is required. Matrix design allows for shifting personnel and sharing facilities, depending on respective needs across product lines.

Matrix designs were first developed and implemented in the aerospace industry and by the National Aeronautics and Space Administration. More commonly, the matrix design is used in organizations such as

9. S. M. Davis and P. R. Lawrence, *Matrix* (Reading, MA; Addison-Wesley, 1977), 11-24.

NASA was a pioneer in the use of the matrix design. Such a structure may not be appropriate for some organizations.



CPA firms, hospitals, consulting firms, advertising agencies, insurance companies, banks, and law firms.

Matrix designs are often implemented through a four-phase process.¹⁰ Phase **I** is the **traditional pyramid**, in which command is unified at the top level. Phase II is where **temporary overlay** is established through development of project teams assigned to highly important projects. Phase **III, permanent overlay**, occurs when project teams are used for ongoing activities. And Phase IV, the **mature matrix**, is reached when power between the functional and project managers is permanently balanced by having equal amounts of authority assigned to their positions.

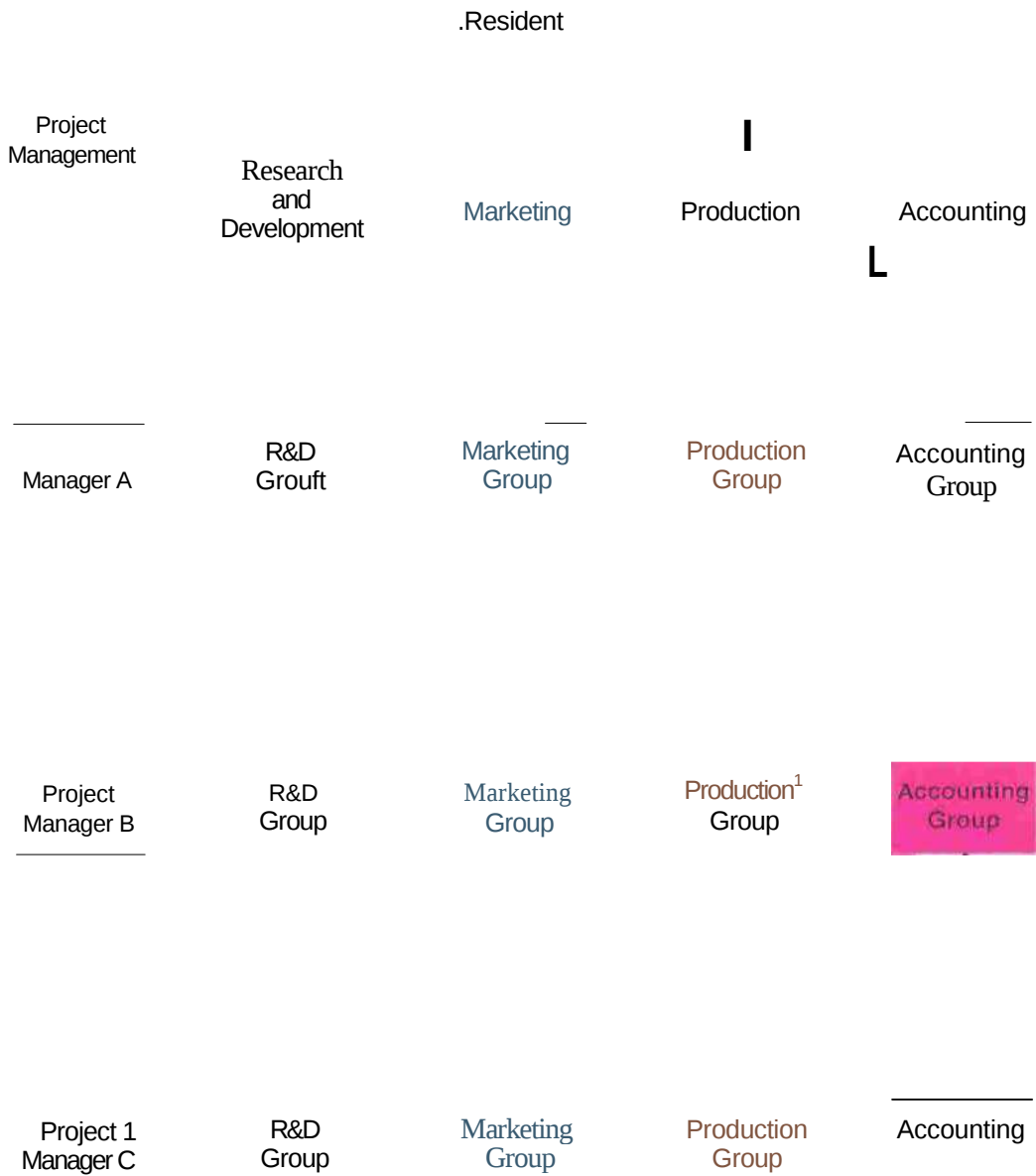
As noted, the matrix design is not for all organizations. It is a complicated design and should be used only when certain conditions exist. Even then, managers should be aware of the strengths and weaknesses of the matrix design. The strengths include the following:¹¹

10. *ibid.*, .19-45.

11. K. Kmghi, "Matrix Organization: A Review," *Journal of Management Studies*. (May 1976), 111-30; and Duncan, "What Is the Right Organization Structure?"



8-1(1) MATRTRX DESIGN



- k. *Allows demands from the environment to be met simultaneously.* Pressures for technical quality as well as multiple products and innovation can be addressed more efficiently and promptly.
- k. *Provides flexibility.* Project teams can be created, modified, and dissolved quickly and continuously as a response to complexity and instability in the environment.
- k. *Encourages resource efficiency.* Personnel can be utilized efficiently by rotating them through projects based on need or assigning one individual to several projects. This reduces the need to hire multiple experts in the organization.
- i. *Enhances skill development.* Through involvement in multiple projects, employees can learn a variety of skills. In addition, general management skills are developed as the employee receives wider exposure to the multiple operations of the organization.
- i. *Increases motivation and commitment* Emphasis on decision making at the project level provides more opportunities for subordinates to contribute to the decision-making process. This in turn generates higher levels of motivation and commitment (di the project.
- k. *Aids top management in planning.* Top management has more time for long-range planning as the matrix design allows for day-to-day operational decisions to be delegated to the functional and project managers.

The weaknesses of the matrix design include the following:

- i. *Creates dual authority confusion.* The assignment of two superiors to one subordinate leads to confusion and conflict. Recall that this structure violates the unity-of-command principle which stipulates that no subordinate should report to more than one superior. As a result, subordinates may receive contradictory directives or instructions. On the other hand, some subordinates may infer that the matrix is a form of anarchy and thus; that they are free to do what they want.
- I. *Spawns power struggles.* The equal sharing of authority by the functional and project managers can lead to power struggles that are unproductive. The functional manager may emphasize technical quality at the cost of production delays, whereas the project manager may emphasize meeting a schedule at the cost of lower technical quality. Efforts to resolve this situation can lead to intense conflict between managers.
- L. *Is time consuming.* The matrix design requires large amounts of time through frequent meetings that are necessary to integral activities. This can result in long delays if meetings get bogged down in discussions not directly related to the project.

- A *Requires interpersonal skill training.* Matrix designs require high levels of interpersonal interaction. Chances for success are greatly diminished if employees are combative, distrustful, or poor communicators. Thus, large investments in interpersonal training may be required.
- ▲ *Generates high implementation cost.* Instituting the matrix design may require years to achieve Phase IV. Additional project managers and staff have to be hired and trained in order for the design to be successful.

Matrix is just one of four organizational designs that managers can consider in the structuring of their organization. Pittsburgh Steel Company, Chase Manhattan Bank, Prudential Insurance, Monsanto, and Dow Corning are some notable corporations which have adopted the matrix design successfully. However, other firms—Citibank, Philips, and Texas Instruments—have adopted the matrix design only to abandon it after disenchantment with its outcomes.

CONTEXT AND ORGANIZATIONAL DESIGN

How do managers know what structural design is best for their organization? While no single indicator is available that will answer this question, there are several important contextual dimensions that can serve to help managers make their decision. These contextual dimensions are the environment, strategy, size, and technology.

No one contextual dimension need dictate the organizational design to be implemented by management. Managers must weigh and consider how each contextual dimension fits with an appropriate organizational design. The remainder of this chapter will examine each contextual dimension and discuss how it influences the choice of a structural design.

Environment and Design

Tom Burns and G. M. Stalker [1961] provide the first extensive formulation of the relationship between an organization's structural design and the environment. After studying 20 industrial firms in England, Burns and Stalker identified two forms of organizational design: mechanistic and organic. In a mechanistic design, which resembles a bureaucratic organization, the structures emphasized rules, specialized jobs, and centralized authority.

In an organic design, rules and regulations were minimal, tasks were done more in groups rather than individually, and authority was decentralized. Members often had to gather information on their own and

Academic Profile

HENRY TOSI



Henry Tosi [Ph.D., Ohio State University) is Professor of Management at the University of Florida. He has been on the faculty of the Graduate School of Business, Michigan State University. He previously taught at the University of Maryland, Cornell University, the University of California at Irvine, and Luigi Bacconi University in Milan, Italy. With Stephen Carroll, he co-authored *Management by Objectives: Research and Applications*, a book based on research at Black and Decker Inc. In addition, Professor Tosi has authored four other books, including *Theories of Organization*, and he is the co-editor of two books, *Motivation and Compensation* and *Organization Behavior: A Contingency Approach*. Professor Tosi has written over 60 articles and papers on management that have appeared in the *Academy of Management Journal*, *Journal of Business*, *Administrative Science Quarterly*, and the *Journal of Applied Psychology*. He is a fellow of the Academy of Management, and in 1972, he served as the president of the Midwest Division.

Q: What do you believe are the most critical parts of an organization's design that a manager must understand in order to be effective?

A: Perhaps the most important thing: that a manager must know about organizational design is that in making a choice of departmental structures, the manager is really determining which problems he or she will have to work on and those which can be minimized by the design. For example, when a firm chooses a divisional organization over a functional organization, it minimizes coordination problems that would occur with the functional organizational design. At the same time, it minimizes problems with accountability because it is easier to assign and control performance in the divisional design.

O: Some pundits claim that the 1970s and 1980s will be regarded as an era when managers became interested in organization restructuring. What has caused this interest, and can we expect to see managers engaged in restructuring efforts in the future?

A: I think the 1970s and the 1980s are decades in which managers realized the importance of organizational structure. In the 70s and continuing into the 80s, there has been a wave of organization mergers and consolidations. These events called for some very complicated organizational designs to be put into place. I think this would become evident if you were to examine the structure of a conglomerate such as Gulf and Western which has divisions in real estate, entertainment, and insurance. My belief is that it takes different approaches to organizational design in each of these industries and, if this is so, this can only create headaches for managers who must coordinate and control activities from the

organization's headquarters. Also, I believe that in many instances where conglomerates have divested certain divisions, it was the result of dramatic differences between the designs of the parent organization and the division which could not be resolved. Managers quickly discover that it is easier to divest a division than to restructure it.

Several important forces for restructuring organizations during this time period stem from a growth in interest in the quality of work and a sense that in the United States there is a need to "Japanese" our major industries. Because of these two forces, many organizations are striving to become more flexible with fewer controls and an emphasis on increasing the utilization of human resources. In the future, managers are going to have to be more willing to make changes in organizational design than they have been in the past. They will have to be able to understand the design options open to them and be flexible enough to implement them. Q: What organizational designs do you believe will become the wave of the future?

A: I think that you will see organizations move in two different directions in the future in terms of their design. Some will become more bureaucratic and rigid as the level of automation and computerization increases. In these organizations, work will become more routine, highly controlled, and boring. The other direction will be organizational designs that are more flexible and changing as new technology is introduced and markets undergo changes. In these organizations, people will have to be very well trained and able to manage themselves without the benefit of explicit managerial controls.

figure out what to do rather than rely on directives from superiors. Figure 8-11 summarizes the differences between mechanistic and organic designs of organizations.

Burns and Stalker also studied the environments of organizations with mechanistic and organic designs. They concluded that a mechanistic design was best suited to a stable environment. In a stable environment, tasks can be specialized and rigidly defined as they are likely to be performed in the same manner. With a lack of environmental and thus task change, rules can be developed and applied over time to maintain control over activities. With a reduced need for decisions at the task level, decision making can be centralized with communication flowing from top to bottom in the organization.

Organic designs were discovered to be more appropriate where the environment is unstable. Tasks are completed through group efforts and are adjusted and redefined in order to cope with demands made by the changing environment. Decision making is carried out by those close to the task as they have a more immediate understanding of problems. Communication is primarily horizontal as members transfer information about adjustments in tasks and changes that have occurred in the environment.

The relationship between environment and organizational design discovered by Burns and Stalker received additional support from Paul R. Lawrence and Jay W. Lorsch (1967). In a study of ten companies in the United States, they found that the match between an organization's design and conditions in the environment influences organizational performance. In addition, they examined the designs of three departments—manufacturing, research, and sales—of each company and concluded that

MECHANISTIC AND ORGANIC ORGANIZATION FORMS _____

Mechanistic	Organic
1. Tasks are broken down into specialized, separate tasks.	1. Employees contribute to common task of department.
2. Tasks are rigidly defined,	2. Tasks are adjusted and redefined through employee interactions.
3. Strict hierarchy of authority and control and many rules.	3. Less hierarchy of authority and only a few rules.
4. Knowledge and control of tasks are centralized at top of organization.	4. Knowledge and control of tasks are anywhere in organization.
5. Communication is vertical;	5. Communication is horizontal.

Source: Adapted from *Innovations and Organizations* by Gerald Zaltman, Robert Duncan, and John Holbek. Copyright © 1973 by John Wiley & Sons, Inc. Reprinted by permission of John Wiley & Sons, Inc.,

the environment has different effects on the subsystems or units of the organization. That is, they discovered that each unit of the organization developed its structural design based on its own unique environment. Thus, a research department working on a high-technology project may need an organic design because of the high degree of change in the environment. The manufacturing department, on the other hand, may need a mechanistic design, assuming that little change is required in the way goods are produced.

Lawrence and Lorsch suggested that organizations will vary along two dimensions as a result of their environment: differentiation and integration. Differentiation describes the extent to which the organization is broken down into departments that differ by managers' orientations and structures. An organization that has many departments which operate differently has a high level of differentiation. An organization that has few departments which operate similarly has a low level of differentiation. Integration is the degree of collaboration that exists among departments. High integration occurs when managers must coordinate their activities with other departments. Low integration occurs when departments can operate autonomously; thus, coordination between departments is not required.

Generally, a complex and rapidly changing environment increases the need for differentiation and integration of an organization. A complex environment requires that managers create highly specialized departments to develop expertise and handle the demands of uncertainty due to environmental change. Increased integration is necessary as frequent change requires greater information processing and adjustments within and across departments.

The studies by Burns and Stalker and by Lawrence and Lorsch illustrate the link between an organization's environment and structural design. Managers of an organization in a stable environment should develop structures that are mechanistic in order to be effective. If the environment is unstable, managers should adopt an organic design for their organization. Managers, however, need to recognize that environments vary by complexity. When the environment is highly complex, an organization should be differentiated with each department developing structures that are best suited to the part of the environment it deals with. Integration is necessary when the departments must work together and when the environment is unstable.

Strategy and Design

Alfred Chandler (1962) advanced the notion that "structure follows strategy." Chandler's conclusion about the relationship between an organization's strategy and its structure was formulated after analyzing the histories of about 100 of America's largest organizations, such as General Motors, Sears, and DuPont. His analysis of strategy examined'

how managers answered the question, "What business are we in?" by focusing on the customers targeted and the competitors considered.

Chandler concluded that the organization's strategy was closely related to a firm's environment and that this relationship influenced the structure of the organization. For example, a firm that saw the opportunity to grow by expanding geographically would be required to alter its structure. This could mean a change to the production of a wider range of goods that might require the firm to shift from a functional to a divisional structure.

In Chapter 6, three adaptive types were presented: defender, prospector, and analyzer. These three strategic types parallel and expand on the ideas of Chandler and others by suggesting which organizational designs are most appropriate for each strategic type. Each strategy has an administrative "problem" to be solved. The solution to the administrative problem for each strategy is presented in Figure 8-12.

Figure 8-12

DESIGN SOLUTIONS TO ADMINISTRATIVE PROBLEM: DEFENDER, PROSPECTOR, AND ANALYZER STRATEGIES

Defender	Prospector	Analyzer
Strategy: To protect the organization's market.	Strategy: Seek high growth in the organization's market.	Strategy: Protect some markets while seeking growth in other markets.
Problem: How to maintain strict control of the organization in order to ensure efficiency.	Problem: How to facilitate and coordinate numerous and diverse operations.	Problem: How to differentiate the organization's structure and processes to accommodate both stable and dynamic areas of operation.
Solutions:	Solutions:	Solutions:
1. Functional design with extensive division of labor and high degree of formalization.	1. Divisional design with low division of labor and low degree of formalization.	1. Matrix design combining both functional departments and product divisions.
2. Centralized control.	2. Decentralized control.	2. Moderately centralized control.
Simple coordination mechanisms and conflict resolved through hierarchy.	3. Complex coordination mechanisms and conflict resolved through mutual adjustment.	3. Extremely complex and expensive coordination mechanisms; some conflict resolution through project managers, some through hierarchy.

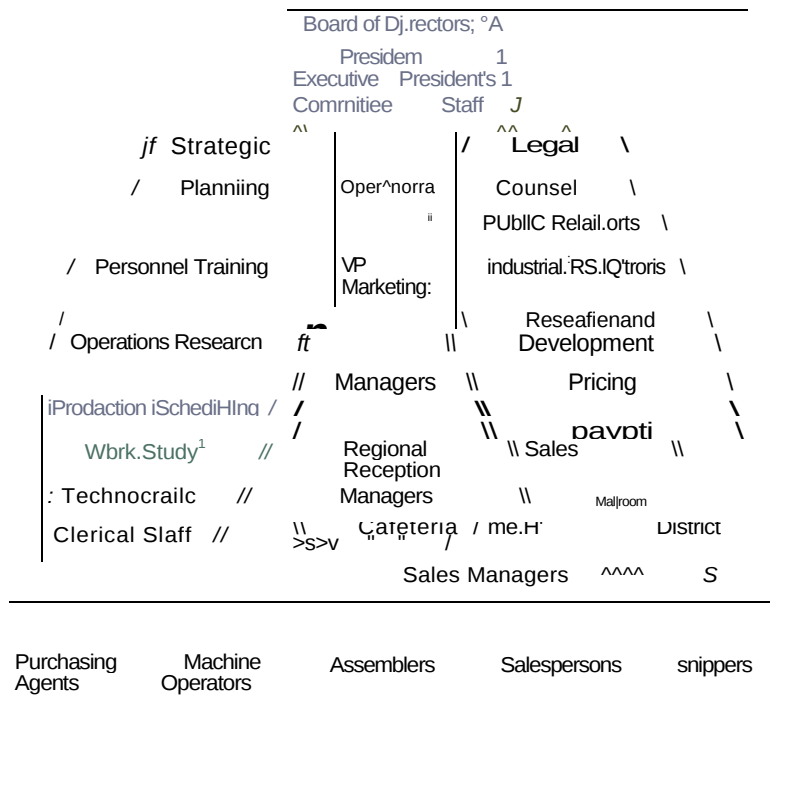
Source: Adapted from Raymond E. Miles, Charles C. Snow, Alan D. Meyer, and Henry I. Coleman, "Organizational Strategy, Structure, and Process," *Academy of Management Review* [July 1978], 546-62.

Further efforts to understand the link between an organization's strategy and an appropriate structural design have been advanced by Henry Mintzberg. Mintzberg identifies five design configurations and their relationships to an organization's strategy and environment. Each design has five basic parts, as described here and illustrated in Figure 8-13:

- A *Strategic apex*. Top management and its staff.
- A *Middle line*. Middle and first-line management.
- A *Operating core*. Members who perform tasks and activities that directly produce a good or service.
- ▲ *Technostructure*. Analysts such as engineers, researchers, planners, and accountants.
- A *Support staff*. Members engaged in such tasks as maintenance, clerical, and mailroom services.

Figure 8-13

THE FIVE PARTS OF MINTZBERG'S ORGANIZATIONAL DESIGNS



Source: Henry Mintzberg, *THE STRUCTURING OF ORGANIZATIONS* ■ 1979, p. 33. Reprinted by permission of Prentice-Hall, Inc., Englewood Clith. New Jersey.

Mintzberg further suggests that organizations vary widely, depending on the strategy and environment, in their methods of coordination. Five mechanisms that organizations utilize in coordinating their activities are as follows:

- ▲ *Mutual adjustment.* Activities are coordinated through informal communication.
- A *Direct supervision.* One individual is designated responsibility over the work of others.
- A *Standardization of work processes.* The content of work or activities is specified.
- A *Standardization of outputs.* The results of work or activities are specified.
- A *Standardization of skills.* Training required to do the work or activity is specified.

Mintzberg contends that the design of an organisation evolves from the formulated and implemented strategy. Five distinct forms of organizational design based on the five parts and five coordination mechanisms are identified as: simple structure, machine bureaucracy, professional bureaucracy, divisionalized form, and adhocracy. These five designs can be matched further with an organization's environment, goals, method of grouping, age, size, and technology, as presented in Figure 8-14. The five designs are described here.

Simple Structure. The **simple structure** is most common among small and young organizations run by an aggressive entrepreneur. Coordination of activities is maintained by a top manager who directly supervises employees in the technical core. The technostructure, support staff, and middle line are underdeveloped or absent. Decision making is retained by the CEO, who is often the owner. Tasks tend not to be specialized. The overall strategy and goals of the organization are directed toward survival and growth. The organization is suited to a simple and dynamic environment with an emphasis on adaptability. Because of its small size, the organization can change quickly with the environment and thus outmaneuver more powerful competitors. Examples of organizations with simple structures are high-technology firms, new government departments, small automobile dealerships, and medium-sized retail stores.

Machine Bureaucracy. The **machine bureaucracy** closely resembles Burns and Stalker's mechanistic design. The organization is large and old, and it divides tasks according to an assembly-line technology. Coordination is achieved through standardization of work processes. The technostructure and support staff are large in number because of the great need for engineers, market researchers, financial analysts, and systems analysts. Key decisions are made in the strategic apex with rigid

Figure 8-14 **DIMENSIONS OF CONTEXT AND STRUCTURE OF ORGANIZATION DESIGNS**

	Simple Structure	Machine Bureaucracy	Professional Bureaucracy	Divisionalized Form	Adhocracy
Environment:	Simple and dynamic, sometimes hostile	Simple and stable	Complex and stable	Simple and stable within diversified markets	Complex and dynamic
Strategy:	Survival and growth	Efficiency	Effectiveness and quality	Efficiency and profits	Innovation and adaptation
Structure:	Functional	Functional	Functional or divisional	Divisional or hybrid	Matrix
Coordination:	Mutual adjustment	Standardization of work processes	Standardization of outputs	Standardization of skills	Mutual adjustment
Key Part of Organization:	Strategic apex	Technostructure	Operating core	Middle line	Technostructure and operating core
Age and Size:	Young and small	Old and large	Varies	Old and very large	Young
Technology:	Simple	Machines, but not automated	Service	Divisible, like machine bureaucracy	Very sophisticated, often automated

Source: Henry Mintzberg, *THE STRUCTURING OF ORGANIZATIONS*, 1979, pp. 466-471. Adapted by permission of Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

patterns of authority. Spans of management are narrow. The machine bureaucracy is best suited to a stable and simple environment with goals directed toward increased efficiency. Steel companies, the U.S. Postal Service, prisons, and automobile manufacturers are examples of the machine bureaucracy.

Professional Bureaucracy. The professional bureaucracy is characterized by an operating core that is primarily composed of professionals, as is common in universities, hospitals, public accounting firms, social work agencies, and craft production firms. Coordination is achieved through standardization of skills. Usually services rather than tangible products are produced in a professional bureaucracy. The technostructure and middle line are often absent, though a large support staff is necessary to handle the organization's administrative affairs.

Decision making is decentralized as professionals in the operating core are powerful. Age and size can vary, while the environment is most often complex and stable. Goals are designed to achieve overall organizational effectiveness with an emphasis on quality of service.

Divisionalized Form. The divisionalized **form** of organizational design achieves coordination through standardization of output. It operates in an environment that is relatively stable and simple, but diversified by product, customer, or geography. Middle managers, who are responsible for division activities, are large in number and make many decisions regarding their divisions. The organization itself tends to be old and very large. Goals direct activities toward efficiency and profit. Divisions tend to structure tasks and activities similar to those in a machine bureaucracy. Examples come largely from *Fortune 500* organizations. Procter & Gamble, Ford, Westinghouse, and IBM are divisionalized organizations.

Adhocracy. The final design based on Mintzberg's framework is the **adhocracy**, typically found in dynamic and complex environments. As in Burns and Stalker's organic design, coordination is achieved through mutual adjustment as it avoids specialization, formality, and centralized authority. Often, adhocracy takes the form of a matrix design with emphasis on activities in the operating core and technostructure. Task activities are highly sophisticated and technical as can be found in aerospace, computer software, and avant-garde film companies. Goals emphasize innovation and adaptation.

Mintzberg's five organizational designs provide unique insight into how various contextual and structural dimensions can be molded into compatible relationships based on a selected strategy. Managers can identify important contextual features, such as the environment, to guide them in the development of an appropriate organizational design. While a departure from the more, traditional approaches to design discussed earlier, Mintzberg's framework does establish common ground: Adhocracy is similar to matrix design, divisionalized form is similar to divisional design, and machine bureaucracy is similar to the functional design. Managers can also consider a simple structure in the early growth stage of their organization and a professional bureaucracy when effectiveness and quality in services offered are the official goals of the organization.

Size and Design

Another contextual dimension that is important for understanding how to design an organization is size. The size of an organization can be measured in a variety of ways. Examples include market share, total revenues, number of employees, and scope of operations. Generally, we use

the total number of employees in the organization as the basis for defining an organization's size. However, we should recognize that some organizations, such as an FM radio station, may garner millions of dollars in revenues with very few employees, while a company that manufactures shoes may obtain less than a million dollars in revenue but have many employees. As a general rule, an organization's size should be measured relative to other organizations operating in the industry. Thus, an FM radio station may be small or large only in respect to the size of other FM radio stations.

From numerous studies conducted on the relationship of organizational size and structural design, one conclusion seems to be consistent: Large organizations are more bureaucratic than small organizations.¹² As organizations grow in size, there are greater pressures on managers to control and coordinate activities. The result is an increase in specialization, departmentation, and decentralization.¹⁵

4 *Specialization.* As size increases, more specialized work practices are likely to result. An increase in the division of labor requires greater supervision and coordination to make the parts of the organization work together.

4 *Departmentation.* Growth in organizational size is usually accompanied by expanded departmentation. Large organizations often require additional specialties. These specialties become grouped into departments which also grow in size with the organization. Many times, departments become so large and unmanageable that they are broken down into several smaller departments, thus increasing departmentation in the organization.

▲ *Decentralization.* In large organizations, decision making is pushed downward and thus becomes decentralized. Top management is unable to make every decision in a large organization because of the long chain of command and the numerous decisions that have to be made regularly. Thus, routine decisions are made at lower levels in the organization. However, these decisions must often be made through explicit rules and procedures which establish boundaries in the decision-making process.

While organizational size is not a perfect determinant of organizational design, managers should be knowledgeable about the effects that size has on structure. This will enable them to understand the types of changes that will be necessary for the organization as it expands in size.

12. I. R. Kimberly, "Organizational Size and the Structuralist Perspective: A Review, Critique, and Proposal," *Administrative Science Quarterly* vol. 21, no. 4 (1976): 571-97.

13. P. M. Blau and R. A. Schoenherr, *The Structure of Organizations* [New York: Basic Books, 1971]; and D. S. Pugh and D. I. Hickson, *Organization Structure in Its Context; The Aston Programme* / [Lexington, MA: D. C. Heath, 1976]

Technology and Design

Technology is a conversion process that transforms organizational inputs into outputs. Technology is not merely machinery, but also includes knowledge, tools, techniques, and actions that are necessary to complete the transformation process.¹⁴ Thus, the concept of technology can be applied not only to manufacturing firms, but also to organizations that engage in information processing (e.g., universities) and service clubs (e.g., Rotarians).

Most of our understanding about the relationship between technology and organizational design comes from the pioneering research of Joan Woodward (1965). Her research demonstrated the way in which technology in manufacturing firms affected the overall design of the organization. Woodward and her colleagues studied 100 firms in South Essex, England, with the original intent of finding what universal principles of management were being applied. Through interviews, observation, and examination of company records, the team of researchers measured such characteristics as management practices and styles, manufacturing processes, size, economic performance, and structural dimensions.

At first, analysis of the data indicated that no management principles were being applied consistently and that differences in their application had no relationship to economic performance. These results directly refuted classical management contentions that there was "one best way" to manage an organization. However, Woodward was not satisfied with merely discrediting classical management theory. Rather, she searched for an alternative explanation that would account for the variations in the way companies in her sample performed. She discovered that a measure of technical complexity, or the firms' technology, accounted for the differences among organizations.

Three basic categories of technology were identified:

- A *Unit, or small-batch, technology*. Organizations utilizing **unit**, or **small-batch**, technology resemble job-shop operations that manufacture custom-made products. The production process resides mostly with individuals who must provide knowledge and skill to the transformation process. These organizations, therefore, tend to be low in mechanization and predictability of the transformation outcome is low. Examples include makers of custom-built cars, custom-jewelry designers, and hairdressers.
- ▲ *Large-batch, or mass-production, technology*. With **large-batch**, or mass-production, technology, the transformation process is performed in an assembly-line fashion characterized by long production runs with standardized parts. Output can be inven-

14. C. Perrow, "A Framework for the Comparative Analysis of Organizations," *American Sociological Review* 32 (1967): 194-208.

toried because products are not designed to satisfy custom needs of the purchaser. Examples of companies that use large-batch technology are automobile manufacturers, large food canners, and soft-drink bottlers.

A *Continuous-process technology*. Continuous-process technology represents the most mechanized and automated transformation process. Machines handle the production process almost entirely; thus, output is highly predictable. Often, there is no starting and stopping of the production process, and quantity of the output is geared toward storage for later sales. Examples would include petroleum and chemical refineries, large breweries, and electrical and nuclear power plants,

Woodward identified unit, or small batch, as the least complex category of technology and continuous process as the most complex category of technology. By studying the types of technology employed by the firms in her sample, Woodward found that structural dimensions were fairly consistent with each technology. Figure 8-15 presents some of the findings from her study.

Figure 8-15 TECHNOLOGY AND STRUCTURAL DIMENSIONS IN WOODWARD'S STUDY

Structural Dimensions	TECHNOLOGY			
	Unit	Large Batch	Continuous Process	
Number of management levels	3	4	6	
Supervisor span of control	U	48	15	
Manager/total employee ratio	%&&	Medium	High	
Number "skilled" workers	W>	Low	High	
Formalized procedures	Low	High	Low	1
Centralization Amount of verbal communication	Low	High	Low	1
Amount of written communication		Low High		
Structural design	Low Organic;	High Mechanistic	Low Organic	

Source: Adapted from Joan Woodward, *Industrial Organization: Theory and Practice* (London: Oxford University Press, 1965)

Note that large-batch technology is best suited to a mechanistic design, while unit and process technology are best suited to organic designs. Large-batch technology requires a greater division of labor and

workers with fewer skills than do unit or process technologies. As a result, more bureaucratic structures are necessary to coordinate and control activities. Structural characteristics, such as span of control, centralization, rules and procedures, and written communication, are also high in large-batch technology because of the standardized nature of the work. The use of more highly skilled workers, decentralization, verbal communication, and few rules and procedures allows unit and continuous technologies to be more adaptable to changing conditions.

The most important of Woodward's findings was the evidence that organisations applying designs complementing the technology were better economic performers than organizations that strayed from the associated structural design. This led Woodward to conclude that there was a technological "imperative" in the design of organizations. That is, technology dictates the design of the organization.

Later research was to discount the technological imperative by noting that the firms in Woodward's sample were, on the whole, small and oriented toward manufacturing. Questions were raised concerning whether the technological imperative was applicable to large organizations and organizations that operated in service industries. Later research largely concluded that, while technology should be considered in the design of an organization, other factors, such as size, strategy, and environment, must be considered as well.^{1*}

IMPLICATIONS FOR MANAGEMENT

Organizational design has important consequences for activities and achievement of goals. Managers must understand how the five basic elements of organizational structure contribute to the performance of the organization. Work specialization can be increased or decreased; departments can be created based on a variety of criteria; authority can be retained by top management or distributed to middle and first-level management; various numbers of subordinates can be assigned to supervisors; and activities can be coordinated by several different methods. Managers must not only contemplate which structures are most effective for their organization, but also must consider how those structures interact with each other.

Organizational designs provide a general framework for structuring organizations and understanding how the structures relate to each other. The most basic design is functional, where departments are based on

15. D. Gerwin, "Relationships between Structure and Technology," in P. C. Nystrom and W. H. Staibuck, *Handbook of Organizational Design* 2 [London: Oxford Univ. Press, 1991] 3-38.

grouping employees by task similarity. As organizations grow in size, managers should consider changing their design to a divisional arrangement. Hybrid designs are useful when support staff is required in the organization, but it is not necessary to have staff distributed across divisions. Matrix design offers managers an appropriate structure when environmental pressures exist for a dual focus; large amounts of information must be processed; and there is a need for efficient use of resources.

When thinking about a new design for your organization, consider the importance of such contextual dimensions as the environment, strategy, size, and technology. Remember that organic designs are most appropriate when the organization resides in a complex and dynamic environment; the strategy emphasizes adaptation and innovation; the organization is small in size; and the technology is of low or high complexity. Mechanistic designs, on the other hand, should be considered when the environment is simple and stable; the strategy requires an emphasis on efficiency in production; the organization is large in size; and technology is large batch.

KEY TERMS
AND
CONCEPTS

adhocracy	centralized	mature matrix
authority		mechanistic design
continuous-process		organic design
technology		organizational structure
coordination		permanent overlay
customer division		pooled interdependence
decentralized authority		product division
departmentation		professional bureaucracy
differentiation		reciprocal interdependence
divisional design		sequential interdependence
divisionalized form		simple interdependence
flat organization		structure
functional design		span of control
geographic division		tall organization
hybrid design		team interdependence
integration		technology
large-batch or mass-		temporary overlay
production technology		traditional pyramid
machine bureaucracy		unit or small-batch
matrix design		technology work specialization

REVIEW
QUESTIONS

1. Identify and explain the difference between coordination and control in an organization.
2. What are the five basic elements of organizational structure-
3. Identify and discuss the six criteria managers can use for grouping jobs and activities in an organization.

4. What are the four fundamental implications that grouping has for employees and the manner in which organizational activities are carried out?
5. Explain the difference between centralized and decentralized authority patterns.
6. How do flat and tall organizations differ?
7. Identify and discuss the eight factors that influence the span of control in an organization.
8. What are the key differences between the four methods of coordination through interdependence of tasks?
9. List and discuss the strengths and weaknesses of a functional design. How do these strengths and weaknesses differ from those of a divisional design? a hybrid design? a matrix design?
10. Explain the difference between a product division, customer division, and geographic division.
11. Describe the four-phase process in which matrix designs are often implemented.
12. How do mechanistic and organic designs differ?
13. What are the differences between differentiation and integration? How does the environment influence their use in an organization?
14. What does the phrase "structure follows strategy" mean?
15. Identify the five basic parts of an organization according to Mintzberg. What are the five mechanisms that Mintzberg identifies that serve to coordinate activities?
16. Identify and discuss the five design configurations suggested by Mintzberg.
17. How does organizational size influence organizational structure?
18. What are the three categories of technologies identified by Woodward? How does organizational technology influence organizational structure?

- REFERENCES ■ Burns, T., and Stalker, G. M. 1961. *The management of innovation*. London: Tavistock.
- Chandler, A. D., Jr. 1962. *Strategy and structure: Chapters in the history of the American industrial enterprise*. Cambridge, MA: MIT Press.
- Davis, R. C. 1951. *Fundamentals of top management*. New York: Harper and Row.
- Graicunas, V. A. 1933. Relationships in organizations. *Bulletin of the International Management Institute* 7:39-42.
- Lawrence, P. R., and Lorsch, J. W. 1967. *Organization and environment*. Homewood, IL: Richard D. Irwin.

- Miller, G. A. 1956. The magical number seven, plus or minus one: Some limits on our capacity for processing information. *Psychological Review* 63:81-97.
- Pfiffner, J. M., and Sherwood, F. 1960. *Administrative organization*. Englewood Cliffs, NJ: Prentice-Hall,
- Woodward, J. 1965. *Industrial organization: Theory and practice*. London: Oxford Univ. Press.
- Worthy, J. C. 1950. Organizational structure and company morale. *American Sociological Review* 15:169-79.

CASE 8 A A New Brand of Management

Procter & Gamble, the company that didn't lay off a single worker in the Depression, has asked scores to take early retirement or just leave. Managers are enthusiastically "Japanizing" production at older plants—though some workers are resisting innovations. Inside the company, staffers are celebrating the declining role of P&G's legendary one-page memo and joining interdivisional teams to cooperate on projects over which a single division once held sway in secrecy. And cost cutting is pervasive, ranging from a 29 percent reduction in hiring to the temporary substitution of paper place mats for tablecloths in an employee lunchroom.

The changes are altering a way of life and work that has long inspired many American companies which have adopted such P&G-pioneered practices as profit sharing and competition among brand managers. Such practices helped the company dominate its many markets. But that dominance has been weakened by tougher competition and maturing markets. Procter & Gamble's Crest toothpaste, for instance, is being threatened by Colgate for being number one in sales. And, partly because of thinning market shares in other divisions, P&G announced in 1985 its first drop in annual operating earnings in 33 years. "If the business isn't growing/" comments a brand manager who says he worked 'by the book/ "you begin to question the book."

That questioning has led to a number of structural changes at Procter & Gamble. For years, P&G has been a top-down organization with a steadily growing bureaucracy. Just about every decision of any significance is pushed upstairs. A former P&G brand manager recalls with amusement how P&G decided whether its new decaffeinated instant Folgers coffee should have a green or gold cap. "The decision went all the way to John Smale," the chief executive officer. [Mr. Smale chose gold.)

The chief tool of these cautious deliberations is the one-page memo. Managers must boil down proposals onto a single page that then gets chewed over and repeatedly bumped back, at higher levels, for rewriting. For many, the memo symbolizes the brand managers' lack of authority. Top management has countered by introducing the "talk sheet" which has been heralded by managers as a dramatic development. The talk sheet, an informal memo outline, allows several levels of management to refine a proposal quickly through conversation instead of just on paper. One advertising manager juc the difference between a memo and a tallcl sheet to be "a week and a half and 15' rewrites."

Moreover, top management is sta ing to loosen its stranglehold on decision"¹) making. For example, it has instituted business teams that now can make decisions oail

everything from product development to cost cutting and encourage cooperation among divisions that used to work in isolation. In the past, marketing or research people might have handed a request to engineering, only to be told that they hadn't anticipated a technical problem that would require redesigns and more approvals, time, and money. "Now we're involved from the beginning/" one engineer says.

Source: Reprinted by permission of *The Wall Street Journal* © Dow Jones & Company, Inc. [May 20, 1985]. All Rights Reserved.

Why does top management at Procter & Gamble see a need to change the way decisions are made?

What is the old method for achieving interdependence? How does this method differ from the "talk sheet" approach? Do you believe management at Procter & Gamble should consider a matrix organization? What strengths and weaknesses might the company obtain by becoming a matrix organization?

