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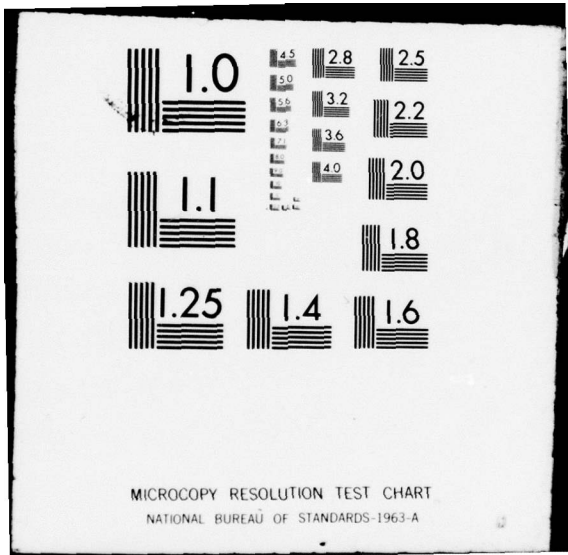
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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER Technical Report No. 163 ✓	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) ORGANIZATION DESIGN ✓	5. TYPE OF REPORT & PERIOD COVERED Technical Report May 1979	6. PERFORMING ORG. REPORT NUMBER
		8. CONTRACT OR GRANT NUMBER(s) N00014-75-C-0556 ✓
7. AUTHOR(s) Arnoldo C. Hax Nicolas S. Majluf	9. PERFORMING ORGANIZATION NAME AND ADDRESS M.I.T. Operations Research Center 77 Massachusetts Avenue Cambridge, MA 02139 ✓	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS NR 347-027
11. CONTROLLING OFFICE NAME AND ADDRESS O.R. Branch, ONR Navy Dept. 800 North Quincy Street Arlington, VA 22217	12. REPORT DATE May 1979 ✓	13. NUMBER OF PAGES 99 pages
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) TR-163	15. SECURITY CLASS. (of this report) TOP SECRET	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Releasable without limitation on dissemination.		DISTRIBUTION STATEMENT A Approved for public release; Distribution Unlimited
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		DDC JUL 10 1979 B
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) organization design segmentation functional, divisional and matrix organizations hybrid organization		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) See page ii. 270 720		

ORGANIZATION DESIGN

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Technical Report No. 163

Work Performed Under

Contract N00014-75-C-0556, Office of Naval Research

Multilevel Logistics Organization Models

Project No. NR 347-027

Operations Research Center

Massachusetts Institute of Technology

Cambridge, Massachusetts 02139

May 1979

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FOREWORD

The Operations Research Center at the Massachusetts Institute of Technology is an interdepartmental activity devoted to graduate education and research in the field of operations research. The work of the Center is supported by government contracts and grants. The work reported herein was supported by the Office of Naval Research under Contracts N00014-75-C-0556 and N00014-76-C-1033.

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ABSTRACT

The purpose of this paper is to review the major concepts underlying the proper design of an organization structure for a business firm. It provides a review of the various managerial processes to support decision making in an organization. It discusses the major organization archetypes (functional, divisional, and matrix organization forms); presents a brief historical overview of various organization theories; and finally concludes with recommendations of steps to be undertaken in the design of an organization structure.

ORGANIZATION DESIGN

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1. Introduction

Organizations are formed whenever the pursuit of an objective requires the realization of a task that calls for the joint efforts of two or more individuals. We can identify the following major components in the definition of an organization (Galbraith [9]):

- Organizations are composed of individuals and groups of people,
- seeking the achievement of shared objectives,
- through division of labor,
- integrated by information-bound decision processes,
- continuously through time.

Organizations are developed around the concept that a complex task can be subdivided into simpler components by means of division of labor. The design of a structure to attain the organization goals requires addressing two primary issues: how to perform this division of labor, and how to coordinate the resulting tasks.

The purpose of this paper is to suggest a methodology to design the structure of formal organizations and to illustrate the application of this methodology to an actual situation. We will concentrate our attention on the design of formal organizations in business firms. However, the issues and methodologies presented might be extendable to other forms of organizations.

The central notion we adopt is derived from the contingency theory of organization design, which states that there is no single set of principles to shape the structure of an organization. Rather, each organization should develop its structure in tune with its internal characteristics, and the relationships with its environment. Therefore, from the outset, we are forced to recognize that the question of organization design does not admit

a simple answer. There is no mechanistic "how to do" recipe. Instead, this paper outlines the basic concepts of design that can be translated into broad guidelines to support the task of structuring an organization.

The organization structure may be defined as "the relatively enduring allocation of work roles and administrative mechanisms that creates a pattern of interrelated work activities, and allows the organization to conduct, coordinate, and control its work activities" (Jackson and Morgan [17]). Thus, this structure is not only a hierarchical allocation of authorities and responsibilities. It encompasses all the managerial processes that concur in the realization of the tasks undertaken by the organization. Usually, these processes give rise to formal managerial systems; among which one can cite the strategic and operational planning system, the communication and information system, the motivation and reward system, and the management control system. The nature of the interdependence between structure and processes is examined in Section 2.

The major organization archetypes (functional, divisional, and matrix), are discussed in Section 3. Although in practice we seldom encounter actual organizations structured in accordance with these pure archetypes, it is useful to reflect on their advantages and disadvantages to gain some insights into the question of organization design.

In Section 4, a brief historical overview is presented. The classical theory, the human relations theory, the organization decision-making theory, and the contingency theory are discussed. The notion of contingency is central in the formulation of a unitary concept of design that calls for segmentation of an organization into units, differentiation of units to adapt to unique environmental conditions, and integration of units to insure a coordinated pursuit of the organization objectives.

The primary recommendations for organization design emerge in Section 5, which addresses both the basic and detailed organization design tasks. The basic structure is heavily dependent upon the strategic positioning of the organization, while the detailed structure is more related with operational matters. The need to fit structure and managerial processes to the strategic and operational demands of the organization is also discussed in that section.

Finally, Section 6 describes a real application of this design approach.

2. An Overall Perspective for Organization Design

The study of the organization structure must give proper attention to the complex web of relationships and mutual conditioning between structure and all other elements of the organization. The purpose of this section is to identify and briefly describe the principal components of an organization, in order to position the notion of structure in its relation with other decision support systems.

A useful starting point is to recall that organizations are molded in the confluence of two fundamentally different systems of needs and objectives. On the one side, we observe the organization as a purposive entity, even though its specific goals may not be transparently defined; and, on the other side, we find the personal and social needs sought by individuals who belong to the organization. Both realities are recognized in what may be called the management focus and the behavioral focus of the organization, and these two aspects are correspondingly supported by essentially different organization mechanisms. The degree of coherence attained between the achievement of the organization objectives and the satisfaction of individual needs is reflected in the organization climate, which can be seen as directly linked to final performance, as shown in Figure 1. In turn, the organization climate that conditioned final performance acts as a factor of change in the managerial and behavioral views of the organization. Therefore, the same figure shows the organization climate as a result and also as a conditioner of these two perspectives of the organization.

Although the basic aim of this paper is to discuss approaches for the design of an effective organization structure, it is important to

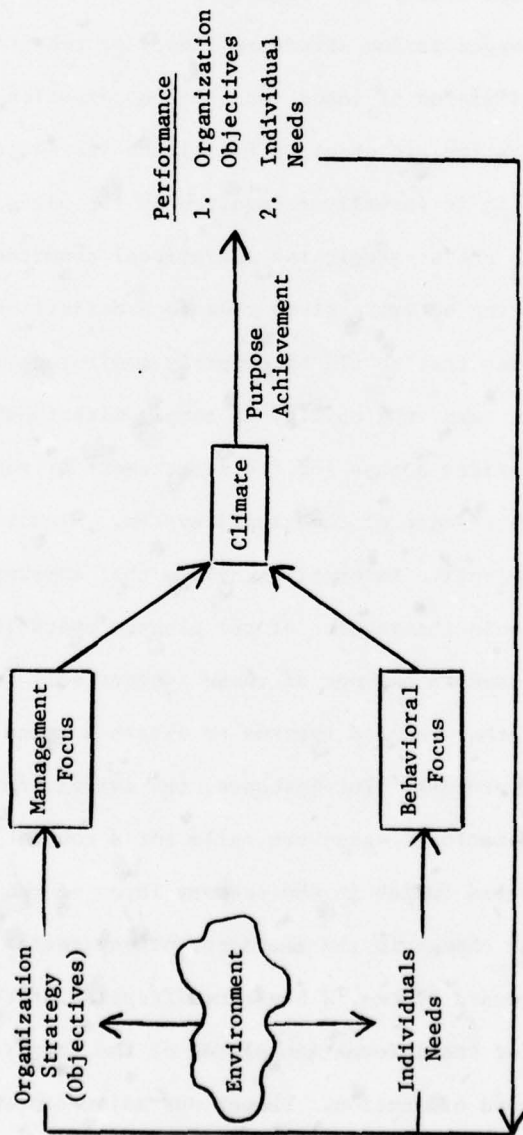


Figure 1: The Management and Behavioral Focuses in the Organization

recognize from the outset that this topic cannot be addressed in isolation. There is a strong interdependence among the basic management support systems of the firm: the organization structure, the planning system, the management control system, the information and communication system, and the evaluation and reward system (see Figure 2).

In fact, the organization structure simply represents an orderly way of conducting the division of labor and the coordination of the major tasks of an organization, in order to facilitate its decision making process. Clearly, that process is formally recognized in the planning system, which attempts to address the strategic and operational commitments of the firm. Moreover, the planning activity gives rise to a definition of standards, goals, and objectives that should be properly monitored by the management control system. In turn, the ability to comply with these goals by individual managers provides a base for the measurement of managerial performance, which is the essence of the reward system. Finally, all these processes need a selective information system that communicates to the managers at all levels the results of the planned operations.

Changes exercised in any one of these systems call for an immediate adjustment on the other related systems to obtain a sound balance of the overall managerial process. For instance, the switch from a functional to a divisional organizational structure calls for a comprehensive review of the accounting process (which is the primary layer of the management control system), a thorough change in the character of managerial accountabilities reflected in the reward system, a basic modification of the planning system, and a full review of the information system of the organization. Thus, we should give a word of caution. Though our major concern will be to deal with organization structure problems, one should not fall into the trap of

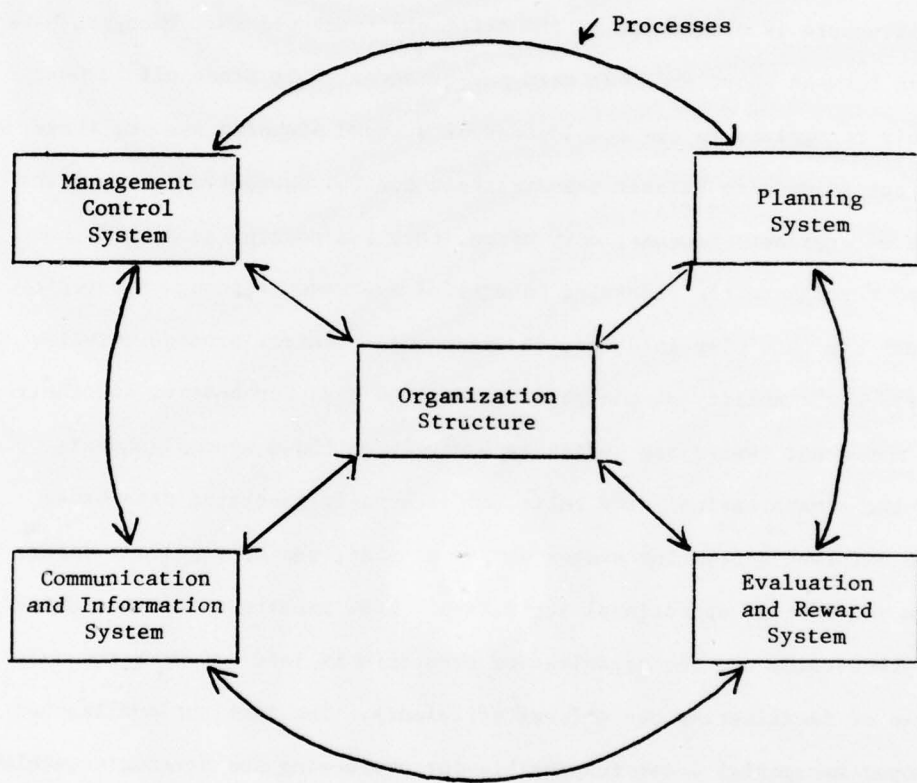


Figure 2: Management Systems: Structure and Processes

thinking that decisions aimed at changing a given structure can be conducted in isolation from the major decision support systems.

Another important issue to bear in mind in the design of an organization structure is originated in the difficult trade-off that managers have to make between short and long term performance. This trade-off is most commonly recognized in the development of a sound planning system, where an effort is made to balance the strategic and the operational objectives of the enterprise. However, very often, this fundamental problem is not carried through to the remaining managerial systems. Although strategic programs are carefully laid out, the management control process normally emphasizes the ability of managers to meet the one year budget, and their performance and reward are judged exclusively on those accomplishments. Also, the communications flow relies on internally generated data based on the existing accounting system which, at best, can only provide information relevant to operational activities. Most important for the subject that preoccupies us, the organization structure is laid out with the sole purpose of facilitating operational efficiency. The institutionalization of proper managerial order responsible for overseeing the strategic development of the organization is neglected.

The fundamental lesson to be learned from these comments is the need to translate the concerns for strategic and operational matters throughout every element of the management support systems. Thus, not only planning should recognize strategic and operational matters, but also the control process has to follow up both strategic and operational goals. Moreover, managers should be rewarded by their abilities to attain both their strategic and operational commitments, and the information system should report the actual realizations in both modes. Our primary thesis, to be developed in detail throughout the chapter, is that a proper organization structure should recog-

nize the strategic positioning of the firm, as well as facilitate its operational efficiency.

3. Organization Archetypes

We turn in this section to the analysis of three archetypes that represent distinct forms of organization structures: functional, divisional, and matrix. They are important design anchors, because these organization structures have been extensively tested and studied, and their advantages and disadvantages are relatively well known. In fact, in practice most organizations present combinations of these three archetypes resulting in what we designate as a hybrid organization. Moreover, this section discusses the historical evolution of the organization structure observed in U.S. firms.

3.1 Functional and Divisional Organizations

Functional and divisional forms constitute the classical opposite archetypes for organization design.

The functional form is structured around the inputs required to perform the tasks of the organization. Typically, these inputs are functions or specialties such as: finance, marketing, production, engineering, research and development, and personnel. Figure 3 presents the organization chart of Admiral Corporation which is structured primarily around the functions of Finance and Administration, Operations, and Sales and Marketing.

The divisional form is structured according to the outputs generated by the organization. The most common distinction of the outputs is in terms of the products delivered. However, other types of outputs could serve as a basis for divisionalization, such as programs and projects. Also, markets, clients, and geographical locations could serve as criteria for divisionalization.

Figure 4 presents the Organization Chart of The Anaconda Company, which has five main product divisions: Primary Metals Division, Anaconda Aluminum Company, Anaconda Wire and Cable Company, Anaconda American Brass Company,

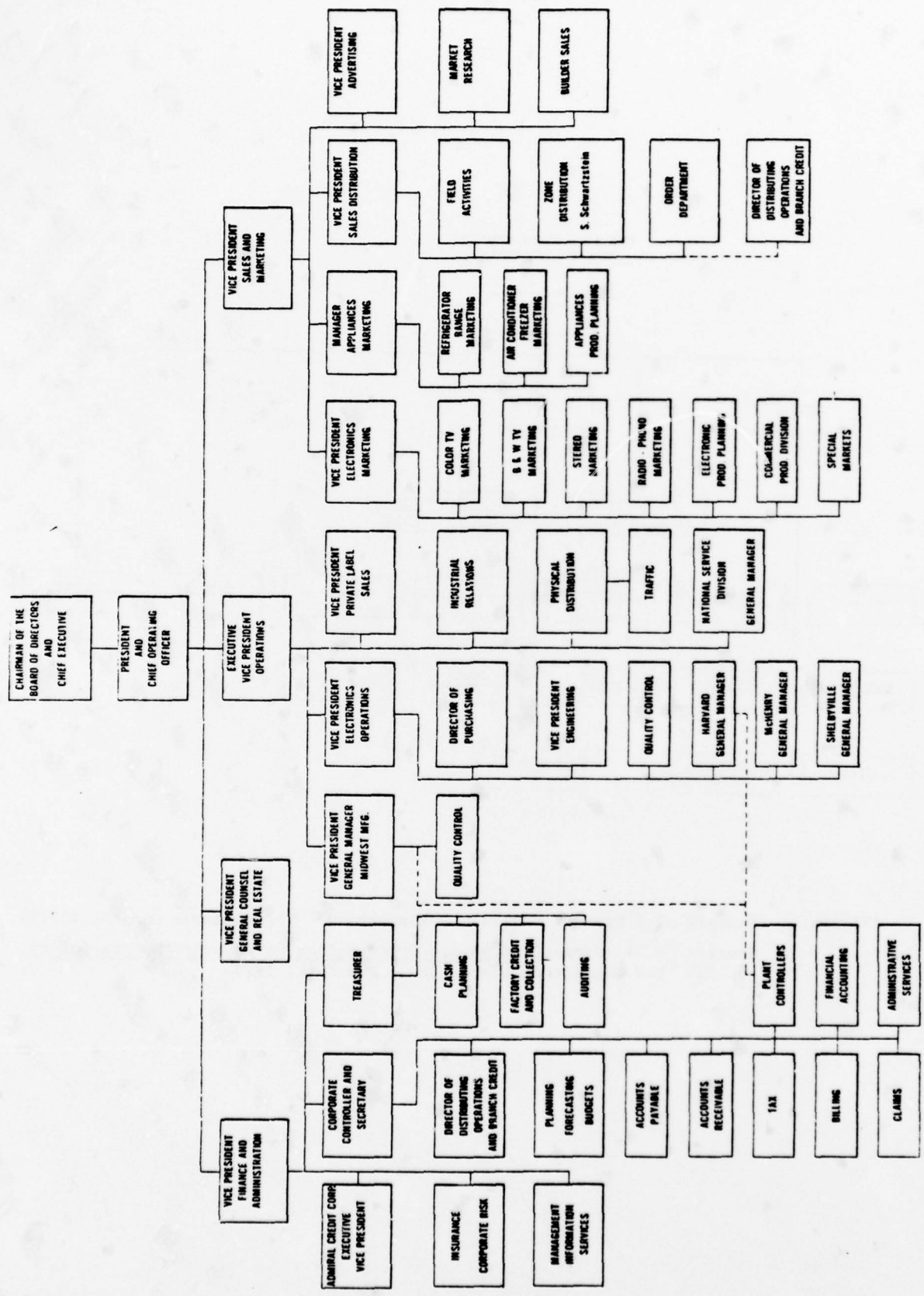


Figure 3: Example of a Functional Organization - Admiral Corporation (1971)

Source: A. R. Janger, Corporate Organization Structures: Manufacturing, The Conference Board, Inc., New York, 1973.

THE ANACONDA COMPANY
CORPORATE ORGANIZATION

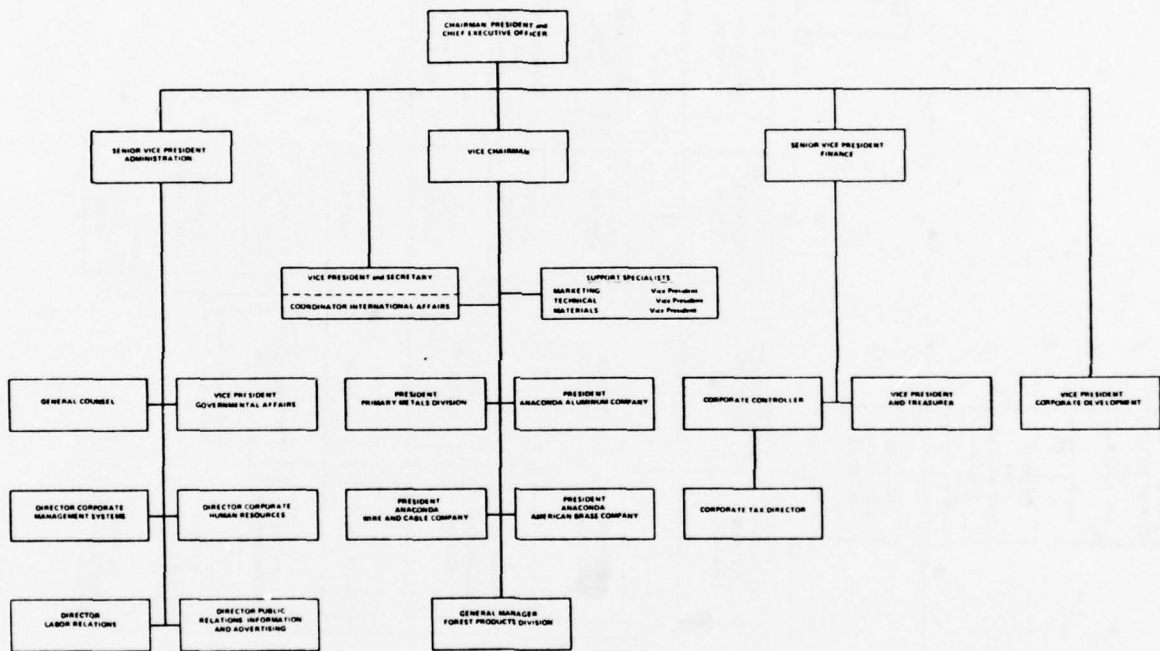


Figure 4: Example of a Product Division Organization - The Anaconda Company (1972)

Source: A. R. Janger, Corporate Organization Structures: Manufacturing, The Conference Board, Inc., New York, 1973.

THE ANACONDA COMPANY
PRIMARY METALS DIVISION
Tuscon, Arizona

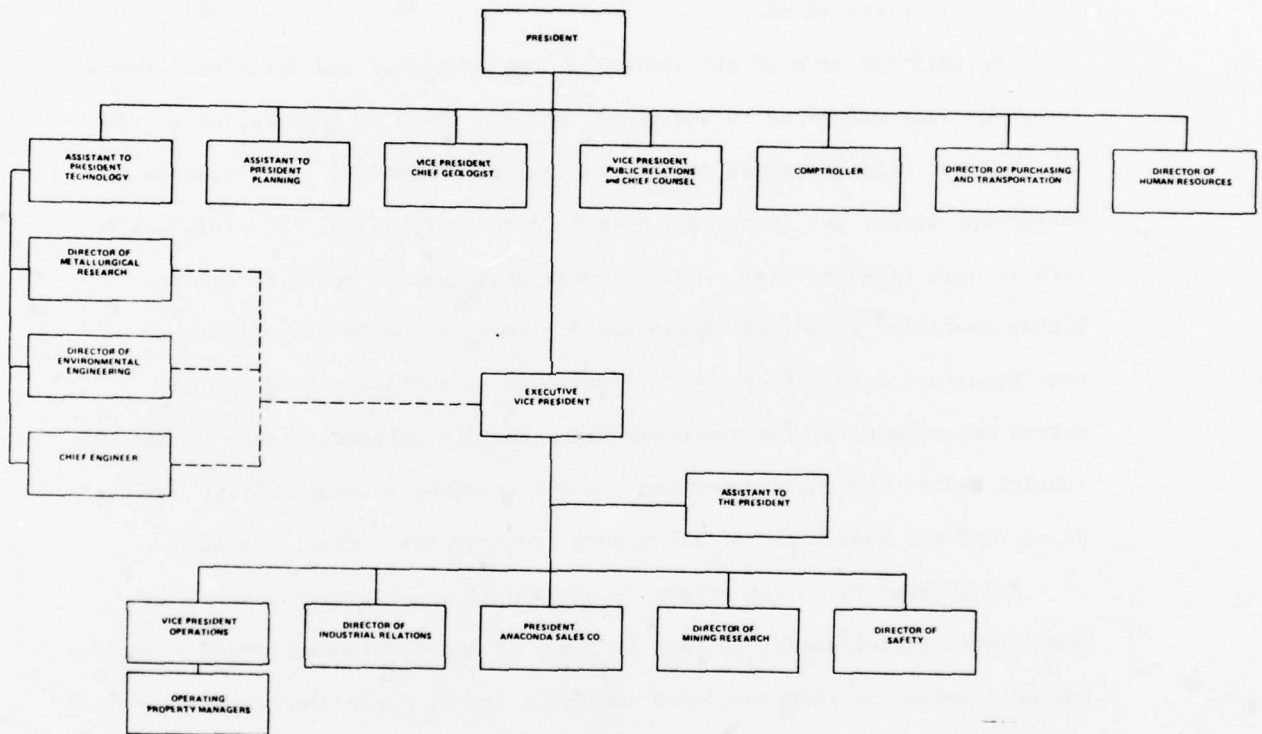


Figure 4 (cont'd): Example of a Product Division Organization -
The Anaconda Company (1972)

Source: A. R. Janger, Corporate Organization Structures: Manufacturing, The Conference Board, Inc., New York, 1973.

and Forest Products Division. The functions of Administration and Finance are held at the corporate level. The detailed organization of the Primary Metals Division shows a typical functional structure with Operations, Industrial Relations, Sales, Mining Research, and Safety reporting to an Executive Vice President.

The full spectrum of attributes of the functional and divisional forms is not totally displayed in the charts above. There is a pervasive character of these organizational structures that differentiate the resulting management style: the functional form is more centralized, the divisional form is more decentralized. A functional organization tends to develop highly qualified technical skills and a climate conducive to technical excellence and high efficiency. It provides a "critical mass" for the career advancement of its professionals. But its inherent stress on specialization pushes the decision-making process upwards, because only at the top do we find the confluence of all inputs required for a final decision.

A different situation exists in divisional organizations, where some functional specialization is lost in favor of added autonomy. Many decisions can be resolved at the divisional manager's level, preventing an overburdened top hierarchy. The middle-layer of managers created in divisional organizations provides an effective training ground for general management skills. Though in charge of only one segment of the overall business, divisional managers are exposed to a full range of managerial problems. That experience gives them a decisive advantage over functional managers, who are confronted with situations involving only their narrow fields of specialty.

An excellent characterization of the distinct managerial profiles required under these two structures has been proposed by Vancil [36] and reproduced in Figure 5. It is not surprising, therefore, that a traumatic

	DIVISIONAL MANAGER	FUNCTIONAL MANAGER
<u>Strategic</u>		
Orientation Relevant Environment Objective of Task	Entrepreneurial External Adaptability	Professional Internal Efficiency
<u>Operational</u>		
Responsibility Authority Interdependence on others	Broad; Cross-functional Less than responsibility May be high	Narrow; Parochial Equal to responsibility Usually low
<u>Personal</u>		
Style Ambiguity of Task	Proactive; Initiator High	Reactive, Implementor Low
<u>Performance Evaluation</u>		
Measurements Quality of Feedback	Profit; Growth; Return on Investment Slow; Garbled	Costs, compared to standards or budgets Rapid; Accurate
<u>Risks and Rewards</u>		
Risk of Failure Compensation Potential	Higher Higher	Lower Lower

Figure 5: Division Managers and Functional Managers - Dimensions of the Task

Source: R. F. Vancil, Decentralization: Managerial Ambiguity by Design, prepublication edition, Financial Executives Research Foundation, Inc., July 1978.

adaptation in managerial style takes place whenever a functional organization changes its structure to a divisional form. The previous functional managers, with their narrow concerns for professional specialization, have to develop a broad entrepreneurial spirit, which is not an easy transition.

There is a certain alignment between authority and responsibility in functional organizations that is absent in divisional forms. An illustration may be useful to clarify this point. A manufacturing manager in a functional organization is fully responsible for the operation concerning plant facilities. His responsibilities completely match his authority.

Turn now to a divisional organization with two divisional managers responsible for two different product lines. If these product lines are manufactured in a common plant, an unavoidable ambiguity results in the accountability of the plant operations. One or both divisional managers do not have total authority over the output of that plant. In this case, at least one divisional manager has more responsibility than authority.

The resolution of conflicts among managers is also different in functional and divisional organizations. The functional organization has a trouble-free functional line, but conflicts of interest among functional managers are usually handled at the top level. The general manager must act as the final decision-maker and arbitrate disputes among specialties, because he is the only one fully accountable for the performance of the organization. This situation could be aggravated by a tendency to develop parochial orientations in each functional group. Since in a divisional organization middle managers are accountable for the performance of their individual business, there is a clear incentive for them to resolve conflicts of interest by direct negotiations among themselves. Normally, ground rules are instituted to facilitate this accommodation process, such as the

development of negotiated transfer prices for goods flowing among divisions.

The direct profit accountability of each segment of a divisional organization creates a genuine business climate at the divisional level that has important motivational implications. In contrast, the principal motivator in functional organizations is technical excellence more than business prominence. This attitude may be considered a drawback in a highly competitive environment.

Both functional and divisional forms are extensively used in structuring organizations. Functional forms are more predominant in organizations having single or dominant products, while divisional forms emerge as diversification increases. An empirical study conducted by Rumelt [29], based on observations of Fortune 500 firms, reports a notorious shift from functional to divisional structure from 1950 to 1970. Figure 6 registers Rumelt's findings. Some arguments given to explain this shift are the increase in diversification by those firms in those elapsing years, the alleged higher efficiency of divisional forms, and their ability to deal with growth and cope with size and complexity. However, a conscious effort must be made to retain critical technical expertise when a divisional structure is adopted. In fact, most divisionalized corporations still retain a central R&D function.

An interesting example pointed out by Janger [18] shows the change undertaken by Kendall Company from a divisionalized organization in 1970 to a functional one in 1972 (see Figure 7). This case, which is contrary to the normal evolution of most corporations, might represent an attempt to regain specialization and efficiency by adopting a functional form.

As complexity begins to grow in the context of the evolution of an organization, decentralization is a must. It becomes impossible for the top manager to retain his role as the sole coordinator of all the acti-

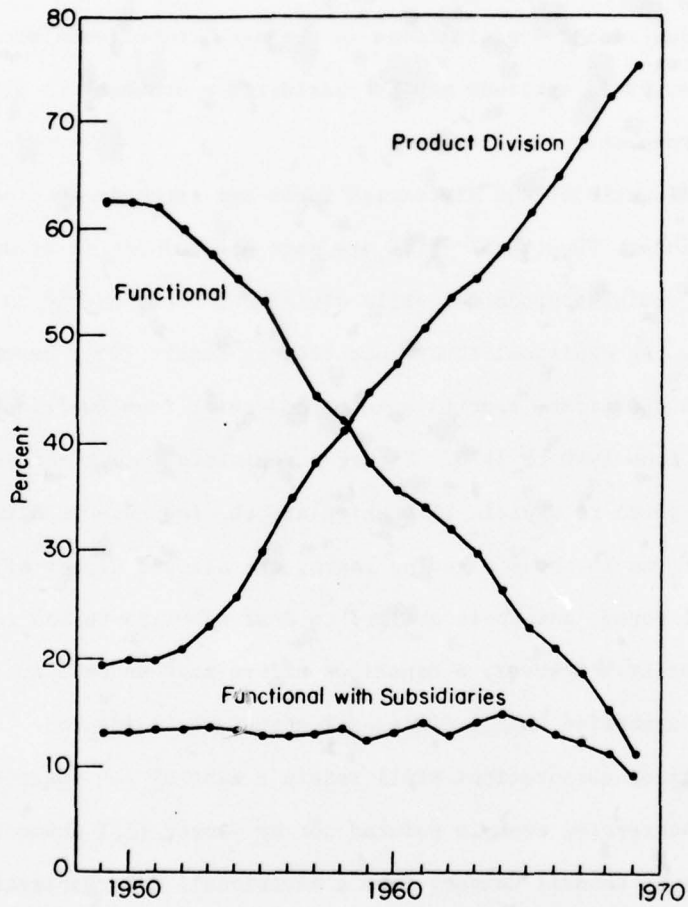


Figure 6: Estimated Percentage of Functional and Divisionalized 1949-1969

Source: R. Rumelt, Strategy, Structure, and Economic Performance, Division of Research, Harvard Business School, Boston, MA, 1974.

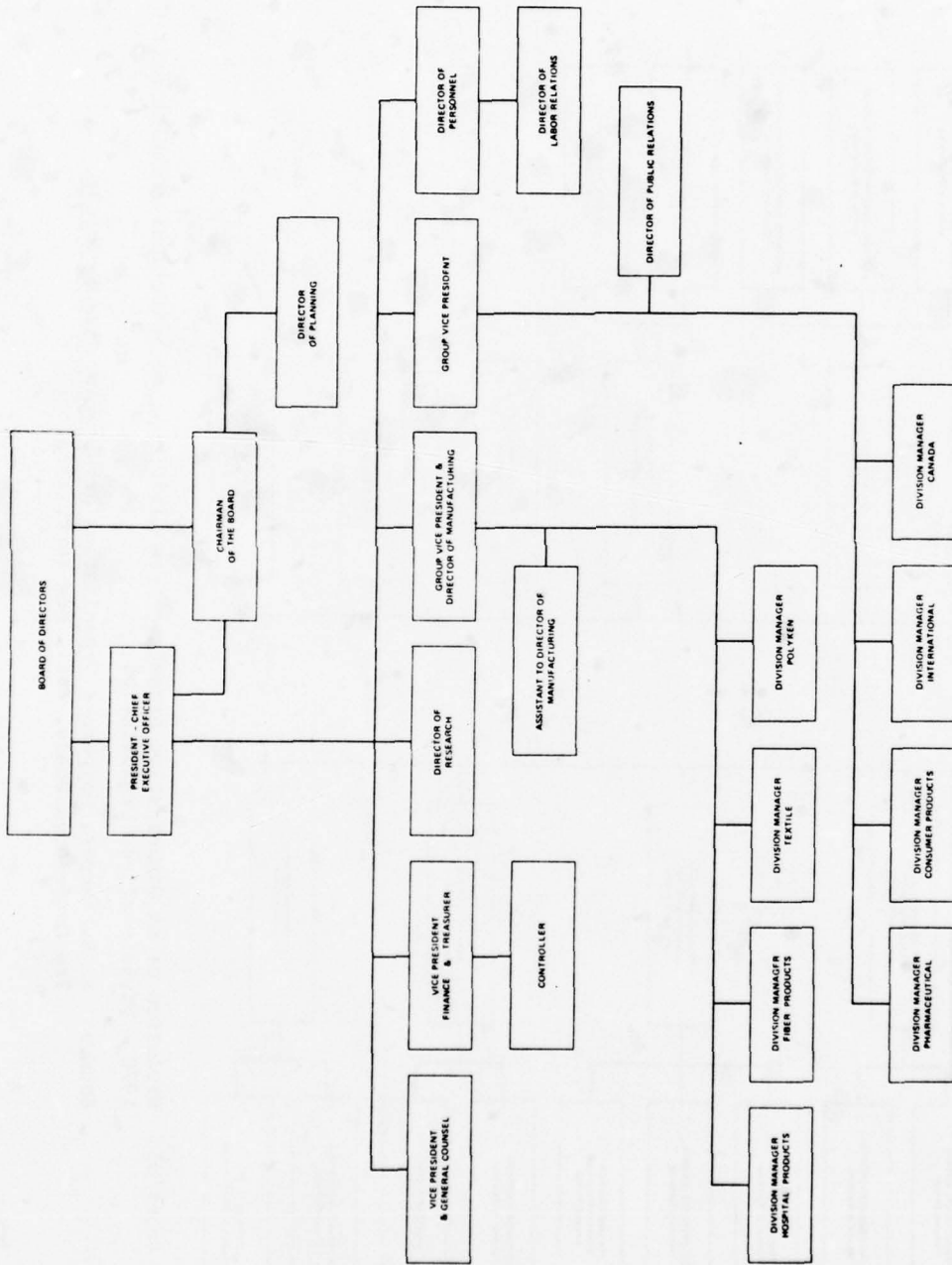


Figure 7: Evolution of an Organization Structure from Divisional to Functional - The Kendall Company 1970 - Divisionalized Organization
Source: A. R. Janger, Corporate Organization Structures: Manufacturing, The Conference Board, Inc., New York, 1973.

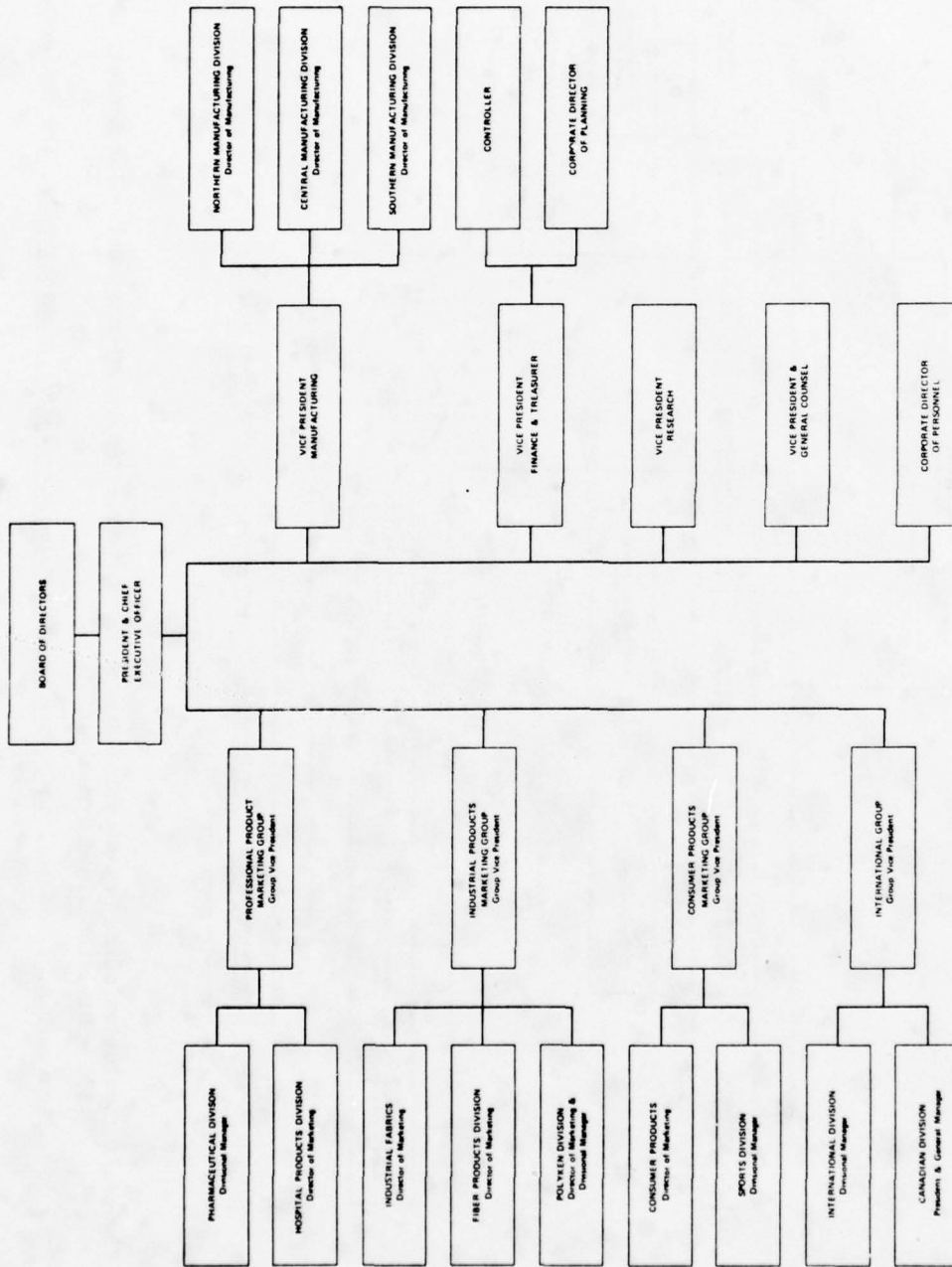


Figure 7 (cont'd): Evolution of an Organization Structure from Divisional to Functional - The Kendall Company
1970 - Divisionalized Organization

Source: A. R. Janger, Corporate Organization Structures: Manufacturing,
The Conference Board, Inc., New York, 1973.

vities of the organization. Even more important, he is unable to understand intimately the variety of businesses in a diversified setting to provide the necessary strategic guidance. Therefore, in most complex organizations the valid question is not whether to decentralize, but what the degree of decentralization should be. Solomons [33] suggests four thoughtful requirements for successful divisionalization:

First, the divisions should be sufficiently independent in terms of production and marketing resources to facilitate separate accountability.

Second, though substantial independence of divisions from each other is a necessary condition for successful divisionalization, if carried to extremes, it would destroy the very idea that such divisions are integral parts of a single business. This suggests some degree of interdependence among divisions.

Third, no division, by seeking its own profit, should reduce that of the corporation. This can be accomplished by developing planning, budgeting, and monitoring systems designed to stimulate divisional initiatives, while preventing actions counterproductive to the overall corporate performance.

And fourth, corporate managers, should exercise self constraints in issuing directives to divisional managers.

Sloan [32], one of the foremost architects of the modern American corporation, addresses the significance of this last point by emphasizing the conscious need, on the part of the Chief Executive Officer, to restrain his personal involvement on divisional matters. This is not an easy task to do since the final accountability for corporate performance still resides on the chief executive's shoulders. However, no successful decentralization can be accomplished without relinquishing part of his authority to

the divisional managers. This creates a definite imbalance of responsibility and authority at that level. Vancil [36] labels this unresolved definition of responsibilities as a necessary "Managerial Ambiguity by Design", which is only resolved as a result of day-to-day personal interaction among the Chief Executive Officer and his divisional manager.

A final comment is worth making on the second criterion for successful decentralization stated above. By requiring some degree of interdependence among divisions, Solomons [33] seems to cast some doubt on totally unrelated diversifications as a successful strategy to pursue. This statement encounters some support in Rumelt's findings [29], who detects the highest level of performance in those organizations seeking related diversification strategies.

3.2 Matrix Organizations

Functional and divisional organizations are structured around one central design concept. Inputs (functions or specialties) are the molding principle in functional organizations, and outputs (products, programs, markets, geographical locations) are the basic dimensions for divisional forms. This clear identification of a main guideline in the definition of a structure stems from the "unity of command" principle of classical writers, that ordinarily has been interpreted as the one-boss rule. Whenever a single focus is selected as the basis for organization design, a single individual can be assigned responsible for the management of an organizational unit in charge of performing that task. This leads to the one-boss concept. Matrix organizations are a fundamental departure from this unitary notion. They are structured around two or more central design concepts. A classical example of matrix organization is Dow Corning, reported by Goggins [14], and illustrated in Figure 8, where the intersection of business units and

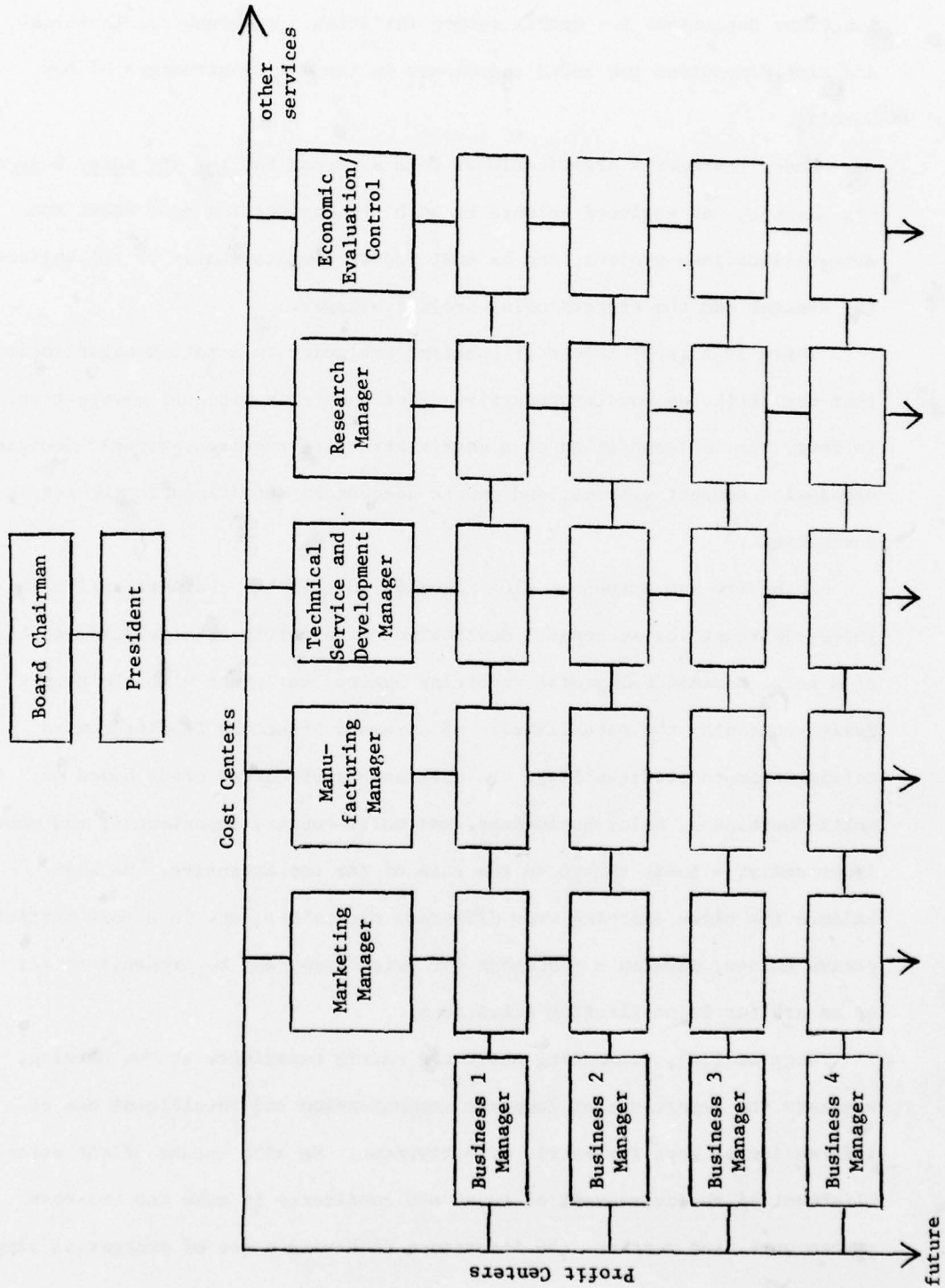


Figure 8: Example of Matrix Organization - Dow Corning (1974)

Source: W. Goggins, "How the Multi-Dimensional Structure Works at Dow-Corning", Harvard Business Review, Vol. 52, No. 1, January-February 1974.

functions determines the matrix responsibilities. Geographical locations and time dimensions are added components in the matrix structure of Dow Corning.

Under the matrix organizational form a person has two (or more) bosses. For example, an engineer belongs to both the engineering department and some well-defined project, and he must report simultaneously to the engineering manager and the corresponding project manager.

There is a large amount of inherent ambiguity in a matrix organization that may strike as counterproductive under a more traditional perspective. In fact, the implementation of a matrix structure requires properly designed managerial support systems, and people adequately sensitized to the matrix environment.

Galbraith and Nathanson [10] identify some of the characteristics they judge important for successful development of a matrix climate: the adoption of a multi-dimensional profit reporting system consistent with the matrix design concepts; the establishment of a reward structure leaning toward total corporate profitability; the development of career paths based on multi-functional, multi-businesses, and multi-country experiences; and most importantly, a basic change in the role of the top executive. He must balance the views emerging from different dimensions, act in a more participative manner, develop a judgement for priorities, and be prepared to act as an arbiter in conflicting situations.

Goggins [14], commenting about the matrix experience at Dow Corning, suggests the importance of complete communication and intelligent use of information as keys for matrix effectiveness. He also speaks of the establishment of an environment of trust and confidence to make the two-boss system work, and mentions the importance of having a set of managerial support

systems, like: management by objectives, personnel reviews, planning processes, economic evaluation, profit reporting, and new business staging.

Despite the belief expressed by these authors in the possibility of a matrix organization to work effectively, serious doubts have been cast on its successful implementation. A natural tendency exists to depart from the two-boss conflict inherent in the ideal matrix. An argument can be made for the emergence of only one real boss, who is the one physically closer, controls the budget, assigns tasks, determines performance and rewards, or is central to the future career development of the subordinate.

An empirical study performed by Kahn, et al [19] concludes that the ambiguity in the unit of command principle generates frustration, low productivity, and high absenteeism. Moreover, matrix organizations tend to generate multiple and conflicting loyalties, require people with high tolerance for ambiguity, create conflict of roles, confusion around the actual authority, difficulties with the reward system, and problems of power inversion (the subordinate may reject a demand from a boss, arguing instructions from "the other boss").

A more balanced exposition about matrices is made in an Organization Planning Bulletin of General Electric [12], that describes matrices not as a panacea but as a difficult organizational form that may be the unique solution to balance the management of a business between competing points of view: A matrix organization is not a

... bandwagon that we want you all to jump on, but rather that it's a complete, difficult, and sometimes frustrating form of organization to live with. It's also, however, a bellwether of things to come. But, when implemented well, it does offer much of the best of both worlds. And all of us are going to have to learn how to utilize organizations to prepare managers to increasingly deal with high levels of complexity and ambiguity in situations where they have to get results from people and components not under their direct control.

Davis and Lawrence [5] define three preconditions that have to be met before the organization considers the matrix as a potential structural form. Otherwise, there are alternative managerial systems that can reinforce more traditional organizational forms without having to resort to the full implementation of a matrix. Those preconditions are:

1) Outside pressure for dual focus.

As already noted, the first necessary requirement for the development of a matrix organization is the coexistence of more than one fundamental focus of managerial concern.

2) Pressures for high information-processing capacity.

A second necessary requirement for the adoption of a matrix organization is the existence of a need for processing massive amounts of information at key managerial levels. This need could result from: changing and unpredictable environmental demands, increased task complexity due to diversification of both products and markets, and strong interdependence among managers for the execution of a given task. The absorption of this voluminous information is facilitated through the intimate coordination assured by the two boss system.

3) Pressures for shared resources.

The final necessary condition for developing a matrix organization occurs whenever great pressures for high efficiency force the sharing of critical resources; such as physical facilities, capital and human resources, and professional experience. The matrix organizations guarantee great efficiency in the utilization of these resources by sharing them among all products or projects, while maintaining a functional centralized control.

Furthermore, Davis and Lawrence suggest that a matrix does not result from the mere adoption of a matrix structure, but also requires the establishment of a matrix system, a matrix culture, and a matrix behavior.

The path from a traditional organization to this highly demanding matrix form is facilitated by a gradual implementation of the concept via integrating mechanisms of increased sophistication that enhance lateral relations. These mechanisms will be discussed in Section 4.

Only a gradual approach to the complex and ambiguous operation of a matrix organization gives the people involved the time needed to adapt their behavior to the demands of this organizational form.

3.3 The Hybrid Organization

The basic organizational forms presented previously are abstractions of a more complex reality. In general, the structure of organizations stems from more than one of these pure models, though the dominant pattern can be traced back to one of them. In fact, most divisional organizations have a number of functional specialties centralized at the corporate level.

Vancil [36] sampled around 300 divisionalized corporations and reported the following percentages of firms having decentralized functions.

Administration	54%
R&D	64%
Manufacturing	70%
Distribution	79%
Sales	82%

He concluded from these empirical results that there is a stronger tendency to decentralization for functions closer to the final consumer.

The structure of United States Gypsum Company provided in Figure 9 illustrates a hybrid organization. There are three main product divisions: Construction Products, Industrial Products, and Specialty Products. There is an international division for all Mexico companies. Some functional activities are centralized under an Executive Vice President. Corporate Development, Administration, and Finance functions are at the corporate level.

Consequently, an organization structure in a real case is usually a hybrid of the basic archetypes, and the challenge of organization design is to seek a proper balance among these three alternatives to respond more effectively to the performance of the organizational tasks.

We have observed that most divisional organizations retain some centralized functions. Likewise, most large functional organizations tend to create an independent subsidiary or a divisional business operation to add autonomy to secondary segments of its businesses. Similarly, organizations often adopt partial matrix structures to link selected products with related functions.

3.4 Evolution of the Organization Structure: The Case of the American Industrial Enterprise

The pioneer research in this area is due to Alfred Chandler, who published in 1962 his book Strategy and Structure [3]. Chandler suggests that American industrial enterprises experience a developmental sequence along the following four phases:

... the initial expansion and accumulation of resources; the rationalization of the use of resources; the expansion into new markets and lines to help assure the continuing full use of resources; and, finally, the development of a new structure to make possible continuing effective mobilization of resources to meet both changing short-term market demands and long-term market trends.

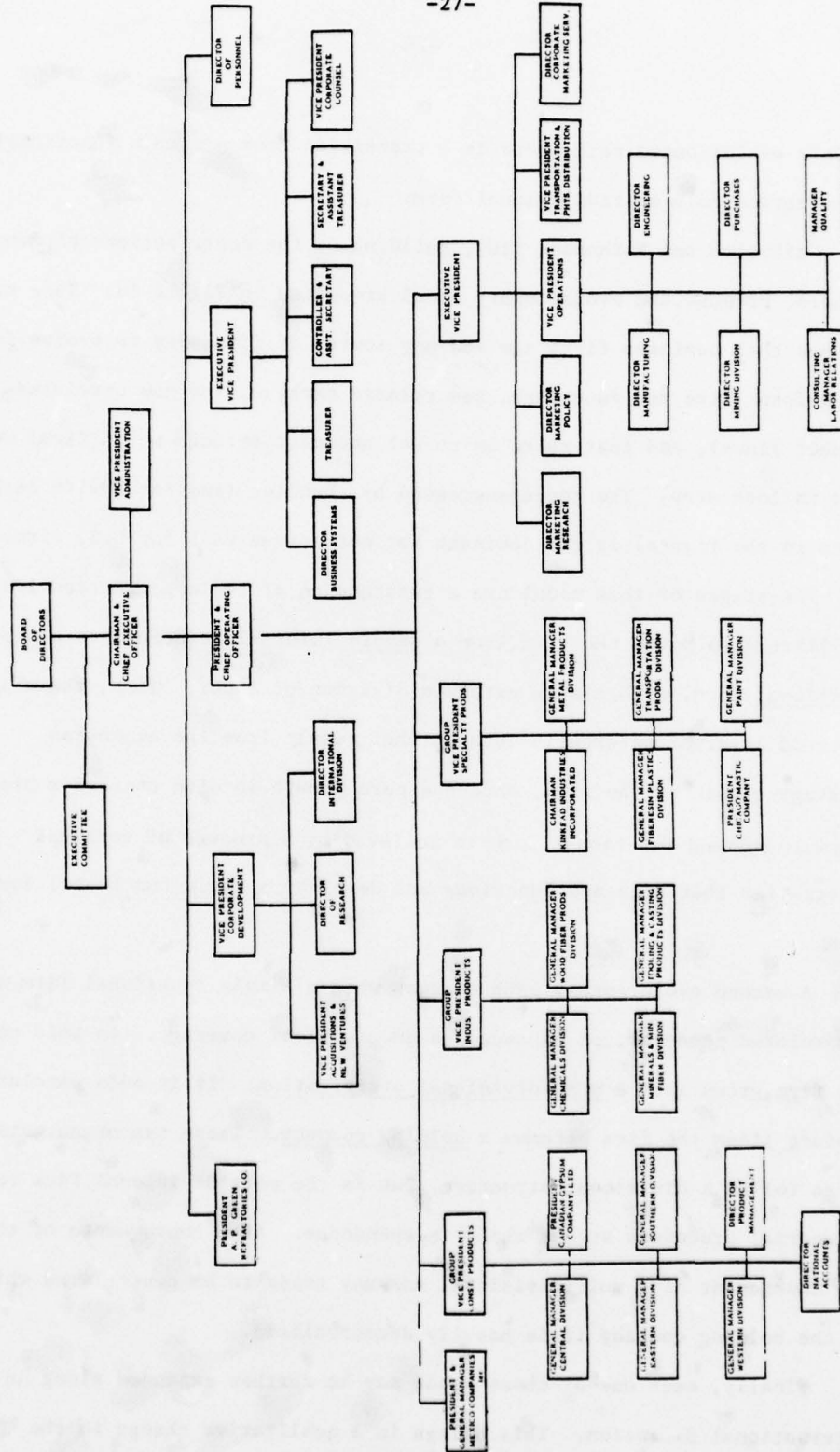


Figure 9: Example of a Hybrid Organization - United States Gypsum Company (1972)
 Source: A. R. Janger, Corporate Organization Structures: Manufacturing, The Conference Board, Inc., New York, 1973.

In this evolutionary path there is a transition from a simple functional organization to a multidivisional form.

Galbraith and Nathanson [10], building on the contributions of many authors, propose the evolutionary model presented in Figure 10. This model assumes that business firms can add any source of diversity to evolve into a new form (like new functions, new related markets, and new unrelated product lines), and that there is no set sequence through which firms must move in lock step. The route suggested by Chandler (indicated with darker lines in the figure) is the dominant but not unique path for U.S. firms.

The stages of this model are a consequence of the organizational growth. The first step moves the firm from a simple informal structure to a simple functional form, with a more extended division of labor. Then, there is a second layer of alternative stages that result from the expansion strategy chosen by the firm, once the pure growth in size reaches a plateau. The centralized functional form is achieved by a process of vertical integration that adds new functions and develops a solid functional foundation.

A second evolutionary path emerges when a simple functional firm adds new related products, or expands its geographical coverage. In this case, the firm grows into a multidivisional organization. If it adds unrelated product lines the firm becomes a holding company. These two organizational forms follow a divisional structure, but in the multidivisional firm the managerial processes stress their independence. As a consequence of this, the management of a multidivisional company tends to be centralized while in the holding company it is heavily decentralized.

Finally, each one of these types may be further expanded along an international dimension. This brings in a qualitative change in the

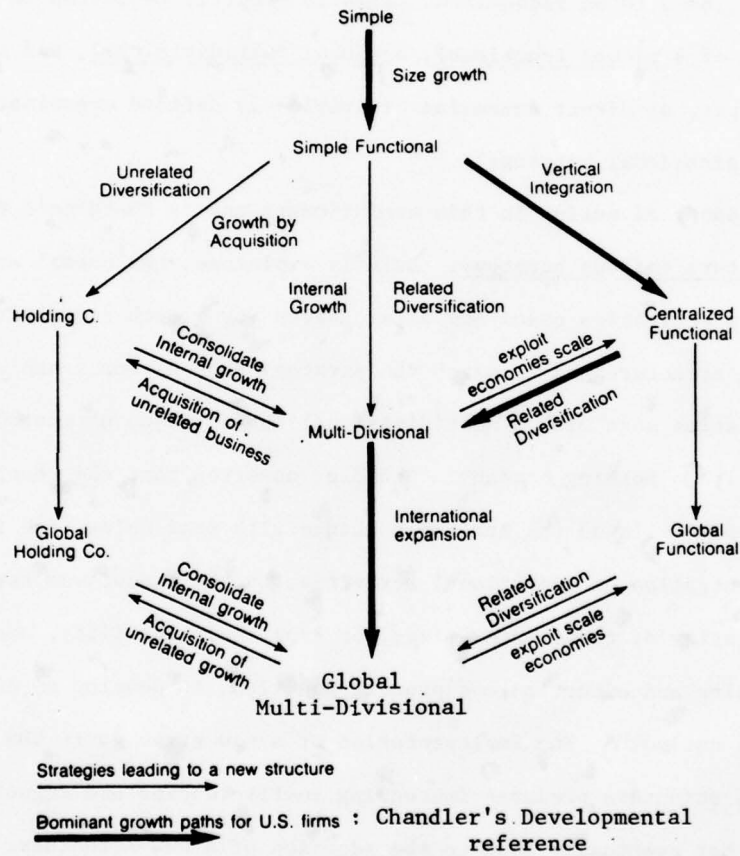


Figure 10: An Evolutionary Model of the Organizational Structure

Source: J. Galbraith and D. A. Nathanson, Strategy Implementation: The Role of Structure and Process, West Publishing Co., St. Paul, MN, 1978.

operations of the organization. New fundamentally different cultural and institutional realities, that call for a special handling of international activities, need to be recognized. This is properly reflected in the definition of a global functional, a global multidivisional, and a global holding types, as direct extension of previously defined organization forms for an international setting.

The essential notion in this evolutionary map is Chandler's thesis that structure follows strategy. Briefly explained, the normal expansion of a firm's activities opens new alternatives for growth and diversification. The firm's structure has to match the strategy chosen; for example, related diversification goes with a multidivisional company, and unrelated diversification with a holding company. Chandler observes that the change in structure has followed the strategic change with some delay, due to an "overconcentration on operational activities by the executives responsible for the destiny of their enterprises, or from their inability, because of past training and education and present position, to develop an entrepreneurial outlook". The implementation of a new strategy in the framework of the old structure produces increasing inefficiencies and organizational tensions that eventually lead to the adoption of a new structure.

4. A Brief Overview of Organization Design Theories

Organization design is not a field sufficiently developed to offer a mature set of theoretical principles, proved in practice, and applicable to a wide variety of situations. At least four important design theories have been proposed in the literature, and each one of them offers some valuable insights. They are: the classical theory, the human relations theory, the decision-making theory, and the contingency theory. This section presents an overview of these approaches to organization design.

Our discussion of the various organizational theories will be brief. More detailed presentations can be found in many good texts on management and organization, such as: Dessler [6], Galbraith [9], Gannon [11], Gibson, Ivancevich and Donnelly [13], Jackson and Morgan [17], Mouzelis [27], and Stoner [34].

4.1 The Classical Theory

The central idea of the classical theory is that, regardless of the nature of the organization, there are certain universal principles that should be followed to obtain a successful performance. The most significant exponents of this theory are the bureaucratic model of Weber [37], the principles of management of Fayol [7], and the scientific management school of Taylor [35]. In Figures 11, 12, and 13 we summarize some of the most widely known ideas of the classical school of organization design. Without going into a detailed analysis of these ideas, it is important to stress that they have caused a long lasting impact, particularly among practicing managers. Many modern organizations still adhere strongly to principles such as equality of authority and responsibility, unity of command, limited span of control, and unity of direction. In fact, many managers still

AN IDEAL ORGANIZATION SHOULD HAVE THE FOLLOWING CHARACTERISTICS:

1. A well defined hierarchy
2. Division of labor practiced along function specialties
3. A well defined system of rules outlining the rights and duties of subordinates and their officers
4. A set of well defined procedures and methods to perform the work
5. Impersonal relations
6. Employment and promotion decisions based on merit and competence.

Figure 11: Bureaucratic Model of Max Weber

1. Division of Labor - to allow high levels of specialization
2. Authority and Responsibility - both should be equal for an individual manager
3. Discipline - resulting from good leadership, fair agreements, and judiciously enforced penalties
4. Unity of Command - each person has one and only one boss
5. Unity of Direction - activities with the same objective should be directed by only one manager
6. Subordination of the individual interest to the common good
7. Remuneration - based on fairness
8. Centralization - the proper balance between centralization and decentralization should be chosen
9. Scalar Chain - a clear and graded scale of authority from the top should exist
10. Order - materials and people should be in the right place at the right time
11. Equity - management should be both friendly and fair to their subordinates
12. Stability - high personnel turnover should be avoided
13. Initiative - should be stimulated
14. Esprit de corps - workers should have a sense of attachment to the organization

Figure 12: Principles of Management of Henri Fayol

1. Develop a science for each element of an individual's work
2. Scientifically select, train, teach, and develop each worker
3. Closely cooperate with the worker to insure that the work is performed in accordance with the scientific principles
4. Assure an appropriate division of work and responsibility between labor and management

Figure 13: Principles of Scientific Management of Frederick Taylor

think that the classicist principles constitute the fundamental foundations in which a sound organization structure should be based.

The most important critics of the classical theory are Merton [26], Gouldner [15], and Selznick [30]. Merton argues that the rules required for the bureaucratic organization make people ignore the actual objectives that these rules are supposed to advance. There is a loss of perspective that transforms the fulfillment of these rules in the final aims being sought. At the same time, decision making becomes routinary, and no attention is paid to environmental changes and the need for strategic adaptation.

Gouldner points to a perverse behavior that induces conflict between chief and subordinate. Bureaucratic rules define minimum levels of acceptable behavior which are taken by employees as a standard which they do not need to exceed. Supervisors react against this undesirable behavior by imposing more stringent rules which increase the level of tension between them and their subordinates, and offer no guarantee that a behavior more coherent with the ends of the organization may be exacted from them. On the contrary, the process seems to convey more and more tension with increasingly complex and narrow rules being added each time.

Selznick finds that the units in a bureaucratic organization tend to develop their own goals which are not necessarily coincident with the goals of the organization.

All these critics contradict the a priori expectation of Weber that a bureaucratic organization is linked with superior performance.

4.2 The Human Relations Theory

Mainly as a reaction to the null role played by the individual in the

classical design theories, the human relations school proposed that the performance of an organization depends exclusively on the human characteristics and behavior in an organizational setting. Important subjects are individual needs, motivation, perceptions, attitudes, values, leadership, informal group behavior, communications, etc. This approach is rooted in the now classical Hawthorne studies (Mayo [25], Roethlisberger and Dickson [28]), but it is better expressed for organizational purposes in the work of Likert [21],[22]. He recognizes four organizational types in the continuum from "classical" to "human" organizations, that he labels System 1, or Exploitive Authoritative; System 2, or Benevolent Authoritative; System 3, or Consultative; and System 4, or Participative. Figure 14 contrasts the main characteristics of Systems 1 and 4. Likert concludes from his study that the maximum performance is attained by means of a System 4 or participative structure. Also, he suggests a practical way to attain this kind of structure which rests in the notion of the linking pin. In Figure 15, each working group is represented by a triangular structure, whose working style is totally participative, and each dot (the linking pin) represents a person who acts as transmitter and coordinator between two horizontally or vertically adjacent groups.

4.3 The Organization Decision-Making Theory

The propositions of the human relations school have been commented on by Simon [31], March and Simon [24], and Cyert and March [4], who suggested a theory to describe the decision-making process in organizations. They claim that individual behavior must be analyzed within the decision-making framework provided by the organization in the rational pursuit of its objectives. Mouzelis [27] suggests that "division of labor; standard procedures, authority,

Classical Design Organization

1. *Leadership process* includes no perceived confidence and trust. Subordinates do not feel free to discuss job problems with their superiors, who in turn do not solicit their ideas and opinions.
2. *Motivational process* taps only physical, security, and economic motives through the use of fear and sanctions. Unfavorable attitudes toward the organization prevail among employees.
3. *Communication process* is such that information flows downward and tends to be distorted, inaccurate, and viewed with suspicion by subordinates.
4. *Interaction process* is closed and restricted; subordinates have little effect on departmental goals, methods, and activities.
5. *Decision process* occurs only at the top of the organization; it is relatively centralized.
6. *Goal-setting process* is located at the top of the organization, discourages group participation
7. *Control process* is centralized and emphasizes fixing of blame for mistakes.
8. *Performance goals* are low and passively sought by managers who make no commitment to developing the human resources of the organization.

Participative Organization

1. *Leadership process* includes perceived confidence and trust between superiors and subordinates in all matters. Subordinates feel free to discuss job problems with their superiors, who in turn solicit their ideas and opinions.
2. *Motivational process* taps a full range of motives through participatory methods. Attitudes are favorable toward the organization and its goals.
3. *Communication process* is such that information flows freely throughout the organization—upward, downward, and laterally. The information is accurate and undistorted.
4. *Interaction process* is open and extensive; both superiors and subordinates are able to affect departmental goals, methods, and activities.
5. *Decision process* occurs at all levels through group process; it is relatively decentralized.
6. *Goal-setting process* encourages group participation in setting high, realistic objectives.
7. *Control process* is dispersed throughout the organization and emphasizes self-control and problem solving.
8. *Performance goals* are high and actively sought by superiors, who recognize the necessity for making a full commitment to developing, through training, the human resources of the organization.

Figure 14: A Contrast Between a Classical and a Participative Organization

Source: J. L. Gibson, J. M. Ivancevich, and J. H. Donnelly, Jr., Organizations: Behavior, Structure, Processes, Business Publications, Inc., Dallas, TX, 1976 (2nd edition)

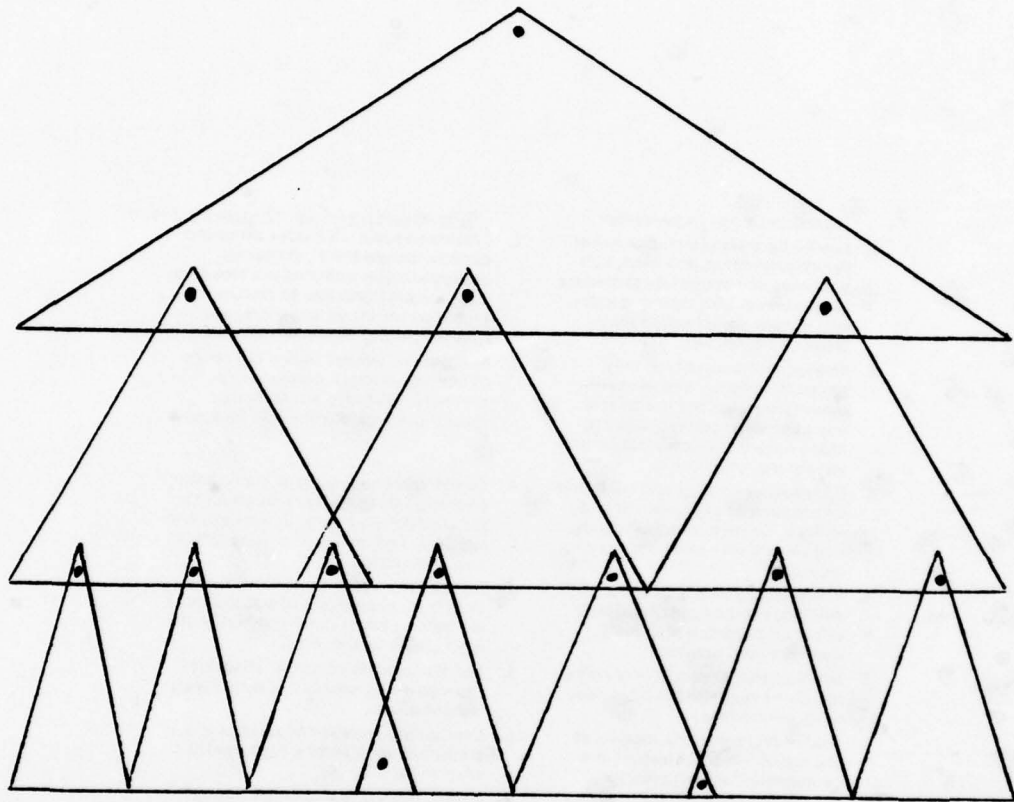


Figure 15: A Model for a "Human Organization"

communications, and training are important organizational features setting limits to and shaping the decisional environment of the individual". Under this perspective, the organization structure is seen as a set of decision making units in a communication network, and the emphasis is on the actual decision making process, the resolution of conflict, the coordination among units, and the information flow. Cyert and March propose four basic principles of decision making which are: quasi resolution of conflict, uncertainty avoidance, problemistic search, and organizational learning. The quasi resolution of conflict suggests that the different coalitions in an organization have conflicting goals, and for the organization to operate it does not have to resolve those conflicts. "Most organizations, most of the time exist and thrive with considerable latent conflict of goals. Except at the level of nonoperational objectives, there is no internal consensus. The procedures for resolving such conflicts do not reduce all goals to a common dimension or even make them obviously internally consistent".

To deal with their uncertain environment, organizations use an uncertainty avoidance strategy. Either they develop fast reactive strategies to manage unexpected situations, or they arrange a negotiated environment to exert some control over unplanned events.

Problemistic search means that organizations direct their search effort toward the solution of a very specific problem (search is motivated). Also, this search uses preferably simple models (search is simple minded). Finally, the search is conducted from the organization perspective of the environment (search is biased).

Organizational learning assumes that organizations exhibit an adaptive behavior through time. Figure 16 gives a condensed view of the organizational decision-making process as proposed by Cyert and March.

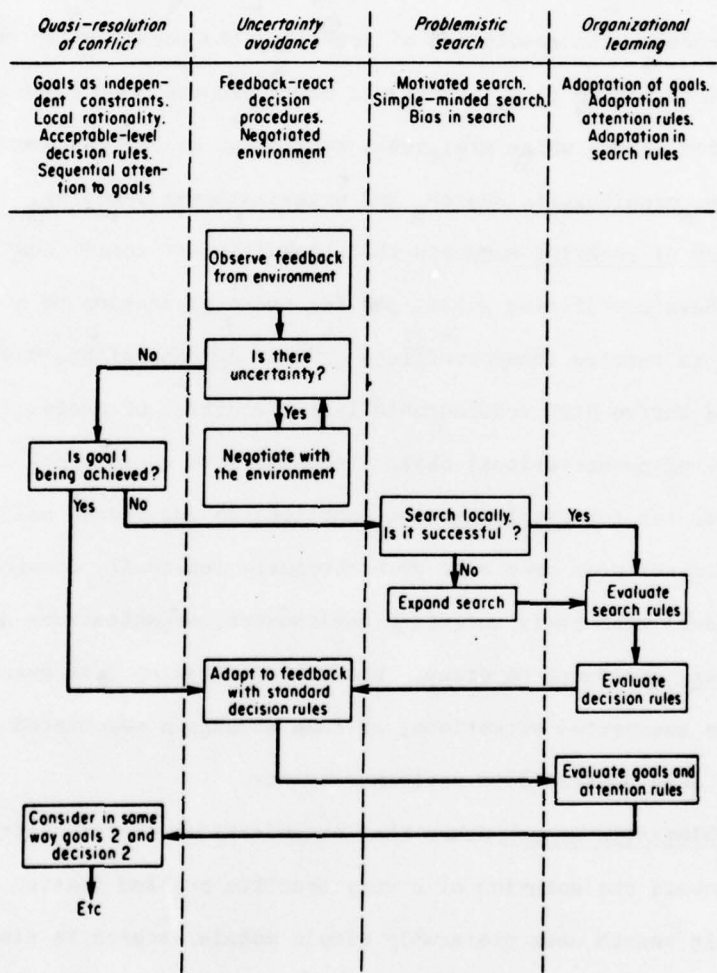


Figure 16: Organizational Decision-Making Process in Abstract Form Proposed by Cyert and March

4.4 The Contingency Theory

The contingency theory approach also reacts against the extreme positions of both the classical and human relations schools, and advances a more intuitively appealing conclusion which integrates those two opposing views: the best organizational design is contingent upon the environmental conditions that the organization faces. There are situations in which a more formal organization performs better, and others in which a more participate one is more appropriate. The most important empirical works that lead towards a contingency approach are now briefly discussed.

Burns and Stalker [2] define the mechanistic and organic forms of organization which roughly correspond to the formal organization of classical theory and to the informal-participative form of the human relations school (see Figure 17). They conclude, from an empirical study, that the mechanistic structure seems to perform better under a relatively stable environment, while the organic structure appears to be superior in a turbulent one. The conditioning of the organization structure to the environmental situation becomes the basis for the contingency approach to organization design.

Joan Woodward [38] tries to determine if some specific structural characteristics could be associated with superior performance in a population of about 100 manufacturing firms. Her conclusion is that some consistent structural pattern seems to emerge only when firms of similar technology are associated together. She distinguishes three basic technologies: unit (job-order, batch, non-repetitive processing), mass-production (assembly line, highly labor intensive), and process or automated (continuous flow, highly capital intensive). The median structural parameters found in Woodward's study are summarized in Figure 18. The most successful firms in each group have parameters close to the median. Also they are more "organic"

Characteristics of Organic and Mechanistic Organizations		
Characteristics of Structure	Mechanistic Organizations	Organic Organizations
1. Division of labor	Functional specialization or departmentation by function	Job enlargement and job enrichment
2. Hierarchy of authority	Clearly defined and centralized	Decentralized and participative
3. Jobs and procedures	Formal and standardized	Flexible
4. Behavioral processes		
a. Motivation	Primarily economic	Both economic and noneconomic
b. Leadership style	Authoritarian	Democratic
c. Group relations	Formal and impersonal	Informal and personal
d. Communication	Vertical and directive	Vertical and lateral consultative

Figure 17: Characteristics of Organic and Mechanistic Organizations

Source: M. J. Gannon, Management: An Organizational Perspective, Little, Brown and Company, Boston, MA, 1977.

	<i>Job Order</i>	<i>Mass Production</i>	<i>Process Manufacturing</i>
Median levels of management.....	3	4	6
Median executive span of control.....	4	7	10
Median supervisory span of control.....	23	48	15
Median direct to indirect labor ratio.....	9:1	4:1	1:1
Median industrial to staff worker ratio.....	8:1	5.5:1	2:1

Source: Joan Woodward, *Industrial Organization: Theory and Practice* (London: Oxford University Press, 1965), pp. 52-62.

Figure 18: The Relationships Between Certain Organizational Characteristics and Technology

Source: J. L. Gibson, J. M. Ivancevich, and J. H. Donnelly, Jr., Organizations: Behavior, Structure, Processes, Business Publications, Inc., Dallas, TX, 1976 (2nd edition)

for unit and process technologies. Though some doubts have been raised on the general validity of Woodward's findings, there is certain consensus on the conclusion that, in high performing firms, the organizational structure is somewhat affected by technology.

As we have commented in Section 3.4, Chandler's work [3] looks at organizations from an historical point of view. He observes that the major strategic shifts of manufacturing firms in this century may be typified as volume expansion, geographic dispersion, vertical integration, and product differentiation. The important conclusion in his work is that to be effective a firm has to adapt its structure to follow the strategy or mission of the organization. This process involves the creation of new functions, new administrative needs, new local focus, and an added requirement for coordination of the variety of units generated in the growth process.

Lawrence and Lorsch's study [20] provides a consolidation of all emerging contingency notions in the concepts of differentiation and integration. It is one of the most important modern works in organization design, and provides the most widely accepted platform for the analysis of this problem.

As indicated before, organizations are based on the subdivision of a complex endeavor into simpler tasks. Only when a complex objective can be expressed in terms of simpler goals, the joint effort of a multitude of people can lead to the pursuit of a common aim. The division of work, of effort, of responsibility, and of authority is translated by the segmentation of the organization structure into a set of units ordered in a hierarchical tree.

Lawrence and Lorsch observe that

... the act of segmenting the organization into departments would influence the behavior of organizational members in several ways. The members of each unit would become specialists in dealing with the particular tasks. Both because of their

prior education and experience and because of the nature of their task, they would develop specialized working styles and mental processes.

This is the concept of differentiation that they formally define as "the difference in cognitive and emotional orientation among managers in different functional departments". The empirical measurement of the degree of differentiation is done in four dimensions:

- managers' orientation toward particular goals - difference in the goals among units
- managers' orientation toward time - long versus short term
- managers' interpersonal orientation - formal-hierarchical versus informal-participative
- variation in the formality of the structure - hierarchical levels, reward system, control system.

The tendency of units in the organization to develop specialized behavior to deal with their particular subenvironment poses a strain in the final achievement of common organizational objectives. "The members of each department develop different interests and differing points of views, [and] they often find it difficult to reach agreement on integrated programs of action." Lawrence and Lorsch define integration as: "... the quality of the state of collaboration that exists among departments that are required to achieve unity of effort by the demands of the environment".

Classical integrating mechanisms are the hierarchy, standard rules and procedures, and planning and information systems. But the demands posed by the complexity of the modern environment call for enhanced possibilities of coordination and interactions. This is achieved through lateral relations, which may be implemented at very different levels of intensity. The lateral integrating mechanisms, in order of increasing complexity, are listed by

Galbraith [8]:

- Direct informal contacts among managers in lateral positions.
- Creation of a liaison role between two independent groups: A person plays a liaison role in an organization whenever the interests of his official unit make advisable a long lasting participation in another unit of the organization. For example, the person that the marketing department assigns as its representative in the development of an information system is in a liaison role. An ambiguity emerges in this case, because he is hierarchically subordinated to the marketing manager, but he spends most of his efforts with the management information system group.
- Creation of a task force: A task force is formed by a group of people belonging to different units of the organization, having a temporary assignment, with a specific objective and time table. Again, a hierarchical ambiguity emerges, since each one of the task force members are subordinated both to their respective group heads, and to the task force head.
- Use of permanent coordinating teams: The most common form of a permanent coordinating team used by organizations is the committee. The only difference with the task force is that committees are permanent while task forces are temporary. The central problem in structuring a committee is the selection of its leader.
- Creation of a temporary coordinating manager: When activities cut across functional or divisional units of the organization, a temporary manager is often designated to fill a coordinating role. A major government order that is overrun, or a specific investment

project that needs cross-functional attention, might call for the assignment of an individual whose primary role is to coordinate the tasks that are needed for a successful completion of that order or project. The temporary coordinating manager normally does not have any formal authority. He has to act either by persuasion, pressure, or by whatever authority has been informally delegated to him by the person responsible for his assignment.

- Creation of a permanent coordinating manager: When a project or product focus needs a constant coordinating attention, a permanent integrating manager role might be required. In this case, the only additional source of authority that this manager might enjoy, with regard to his temporary counterpart, is partial or total control over the project or product budget. It is clear, however, that his responsibility greatly exceeds his formal authority.
- Establishment of the matrix organization form: The most extreme form of forced coordination is the acceptance of a plurality of managerial responsibilities, characteristic of the matrix system.

The Lawrence and Lorsch study shows that the performance of a firm goes up when the level of differentiation and integration are responsive to changes in the environment. Figure 19 provides a comparison of the different integrative mechanisms used by successful firms in the plastics, food, and container industries. The turbulence in the environment is measured by the percent of products introduced in the last ten years. It may be observed that the integrating devices and integrating managers in these firms increases with the change in the environment.

Another significant result reported by Lorsch and Allen [23] shows the major integrating devices used by four conglomerate firms (see Figure 20).

	<i>Plastics</i>	<i>Food</i>	<i>Container</i>
% New products in last 20 years	35%	15%	0%
Integrating devices	Rules	Rules	Rules
	Hierarchy	Hierarchy	Hierarchy
	Goal setting	Goal setting	Goal setting
	Direct contact	Direct contact	Direct contact
	Teams at 3 levels	Task forces	
	Integrating Dept.	Integrators	
% Integrators/managers	22%	17%	0%

Figure 19: Comparison of Lateral Relations Used by Most Successful Firms in Three Different Industries

Source: J. Galbraith, Designing Complex Organizations, Addison-Wesley Publishing Co., Reading, MA, 1973.

Major Integrative Devices in Four Conglomerate Firms				
	<i>Firm 1</i>	<i>Firm 2</i>	<i>Firm 3</i>	<i>Firm 4</i>
PAPER SYSTEMS				
Five-year planning system	X*	X	X*	X
Annual budgeting system	X*	X*	X*	X*
Quarterly budget forecast			X*	
Monthly budget review	X	X*	X*	X*
Monthly operating reports	X*			
Approval system for major capital and expense items	X*	X*	X*	X*
Cash management system	X	X	X*	X
Formal goal-setting system performance evaluation and incentive compensation system	X*	X*	X*	X*
Approval system for hiring, replacement, and salary changes of key division personnel	X*			
INTEGRATIVE POSITIONS				
Group vice presidents	X*	X*	X*	X*
Divisional "specialists" in corporate controller's office				X
COMMITTEES, TASK FORCES, AND FORMAL MEETINGS				
Annual meetings between corporate and division general managers	X	X		
Group management committees	X			X*
Technical evaluation board for capital projects				X*
Permanent cross-divisional committees			X	
Line management task forces				X*
Ad hoc cross-divisional meetings for functional managers	X	X		
DIRECT MANAGERIAL CONTACT	X*	X*	X*	X*

X—indicates presence of devices in each firm.

*—indicates those devices that managers believed played the most significant role in corporate-divisional relations.

Figure 20: Major Integrative Devices in Four Conglomerate Firms

Source: J. Lorsch and S. Allen, Managing Diversity and Interdependence, Division of Research, Harvard Business School, Boston, MA, 1973.

It is of no surprise to find direct managerial contacts and coordinating group vice presidents high on the list of important coordinating mechanisms. Additional integrating devices used by all firms are the budgeting system (which coordinates tactical programs), approval for major capital investments (which coordinate strategic implementation actions), and incentive compensation systems (which provide a common ground for managerial motivation).

The ordered application of segmentation, differentiation, and integration provides a formal mechanism to support the strategy of a firm with an harmonious structural framework. Failing to develop the appropriate structure will have a negative impact on the development of the firm's strategy.

5. Steps in the Design of the Organization Structure

The basic principle for organization design is that structure follows strategy. Under this premise, organization design must be viewed as an integral part of the strategic positioning of the firm. The selected structure should facilitate the development and implementation of the long term directions of the businesses of the organization. Certainly, the structure should also permit the efficient execution of short term operational tasks; but at the beginning of the design process, the attention should be focused on the policies for growth and diversification, which are the paramount concerns of strategic planning.

As we have indicated elsewhere (Hax and Majluf [16]), the main strategic decisions are the selection of the portfolio of businesses of the firm, and the long term development of each individual business. Therefore, an organization structure should facilitate the allocation of resources among its various businesses, support the implementation of the preferred strategy for each individual business, and permit the adaptation of existing businesses to a changing environment. We now comment briefly on the implications that these three issues have on organization design.

First, the allocation of resources primarily deals with the distribution of cash among the various business units of the organization. Some of these units might generate cash to be transferred to other units which need a cash injection to realize their future potential. Obviously, the process of resource allocation is not restricted to financial matters, but also addresses the assignment of human, physical and technological assets. This resource allocation process has as a major implication the need to recognize the business units of the firm, and the managers who are responsible for their full development.

Second, the strategy to be selected for the advancement of an individual business could focus on a number of alternatives, such as geographical expansion, product and process innovation, external acquisitions, internal growth, vertical integration, and international reach. Each one of these alternatives creates a fundamentally different set of requirements that managers have to recognize in the selection of an appropriate organization structure.

And third, the organization should allow for enough flexibility to permit appropriate reactions toward external conditions. This is not an easy criterion to fulfill, since there is a tendency for an organization to lock itself into a form that favors the most efficient exploitation of its current set of businesses.

Based on our professional practice, we have found that two distinct steps should be recognized in the organization design process. The first step is the definition of a basic organization structure. This basic structure represents the major segmentation of the businesses the firm is engaged in through a hierarchical order which reveals the priorities managers assign to the firm's central activities. Only the primary echelons of the organizational chart, which are intimately linked to the strategic positioning of the firm, are recognized in this step.

A second step in the organization design process is the definition of a detailed organization structure. At this stage, the basic organization structure is fleshed out with the numerous specific details that pertain to the operational domain of the firm.

Normally, a number of basic alternatives might emerge as competitors for a final design, each one originating different combinations at the detail level. The process of selecting a final structure implies a soul

searching effort, of a fairly subjective nature, where key top executives engage in a time consuming activity of proposing, defining, testing, and selecting alternative configurations.

The design of an organization structure is completed with the specification of a balance between the organization structure chosen and the managerial processes that go with it: planning, management control, communication and information, and evaluation and reward.

The steps in the organization design process are now more extensively discussed. The application of these steps to a real case study is presented in Section 6.

5.1 Design of a Basic Organization Structure

The fundamental objective of this step is to translate the strategic positioning of the firm in terms of a set of distinctive units ordered in the highest hierarchical levels of the organization structure. Since the focus of strategy is business development, this step requires the full recognition of the businesses the firm is engaged in, and its further segmentation into manageable units.

A simple way to begin the search for business segmentation is to prepare a list of the critical dimensions for the business activities.

Normally, this list includes:

- Products
- Markets: Industrial, Commercial, Government, OEM, etc.
- Functions: Production, Sales, Marketing, Finance, Administration, Personnel, R&D, Engineering, etc.
- Technologies
- Geographic Locations: of markets, and production and distribution

facilities.

A business segment is composed of an orderly assignment of some or all of the above dimensions. At the bare minimum, a business encompasses a combination of products, markets, and some autonomous capacity for product change.

Some companies decide to organize its basic structure in accordance with its primary businesses segmentation. This is normally the case in divisionalized firms, where each division has production and marketing responsibilities, as well as some decentralized functional support. Under these conditions, there is a clear alignment between the strategic and operational objectives of the organization.

However, a basic segmentation following business categories is not always desirable or possible. A company might choose a functional focus as the primary dimension for its basic structure. This selection reflects operational efficiency and technical excellence as its fundamental concern for organization design. Similarly, market location as a primary dimension stresses the importance of a good customer service; and the choice of clients or markets attempts to emphasize the need for a special coverage of a market segment.

In any event, this step of the organization design process calls for a hierarchical recognition of the critical dimensions identified above, with the purpose of obtaining a focus for the basic segmentation. Unfortunately, rarely the basic structure can be simply expressed in terms of a unique dimension. In the process of designing this structure, managers are confronted with a complex choice among competing focuses that must be subjected to a thoughtful trade-off. A careful weighing of the advantages and disadvantages will most likely lead to a primary structure which

is not homogeneous.

For example, in Figure 21, some primary units correspond to products, some to functions, some to clients, and some to geographical regions (international vs. domestic focus).

The absence of a homogeneous criterion of segmentation and the lack of symmetry are not the exception but the rule in the formulation of a basic organization structure. More than one organizational level is usually required to capture the implications of the choice made by managers. One could say that it is possible "to read" the strategy of the organization from the arrangement of its basic structure.

A good example to illustrate this point is provided by the Du Pont organization in 1956 depicted in Figure 22. Notice that there are four major dimensions exhibited in that chart: functions (manufacturing, controller, industrial relations, sales, and research), products (nylon, orlon, dacron, and rayon), markets (home furnishing, industrial markets, mens wear, womens wear), and geographical areas (regions I, II, III, and IV). It is clear from the organization chart that a first priority is assigned to the functional concern, with products receiving a secondary priority, while marketing and regional coverage are assigned a third priority.

When a corporation decides not to organize in accordance with its business segments, a special effort should be made to provide a managerial focus superimposed upon the basic organization structure. A most notorious example of this kind of situation is given by the basic structure of Texas Instruments shown in Figure 23.

The four major groups are both suppliers and customers of each other. This requires a high degree of operational coordination at the highest hier-

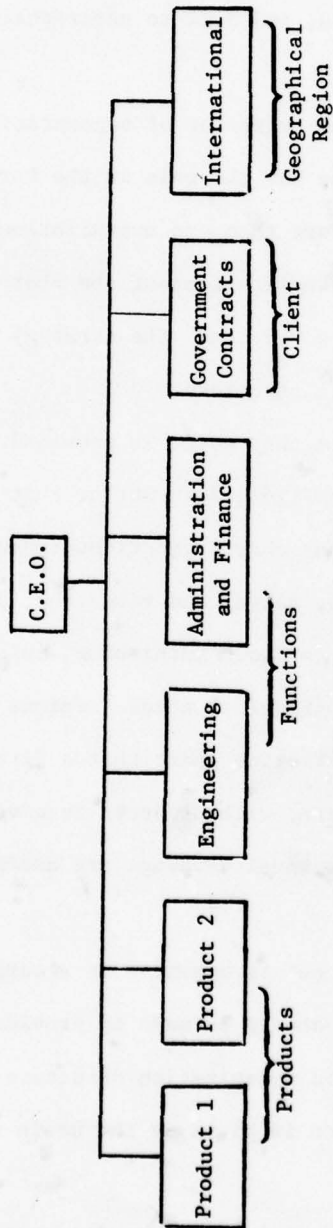


Figure 21: Example Showing the Multiplicity of Criteria Used in the Definition of a Strategic Focus

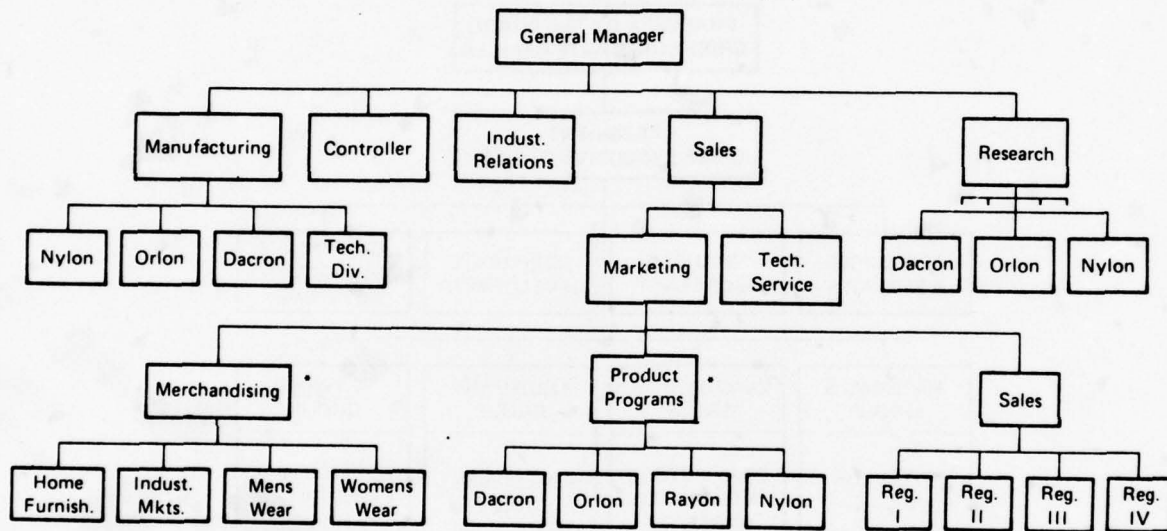


Figure 22: Du Pont Fibers Organization (1956)

Source: J. Galbraith and D. A. Nathanson, Strategy Implementation: The Role of Structure and Process, West Publishing Co., St. Paul, MN, 1978.

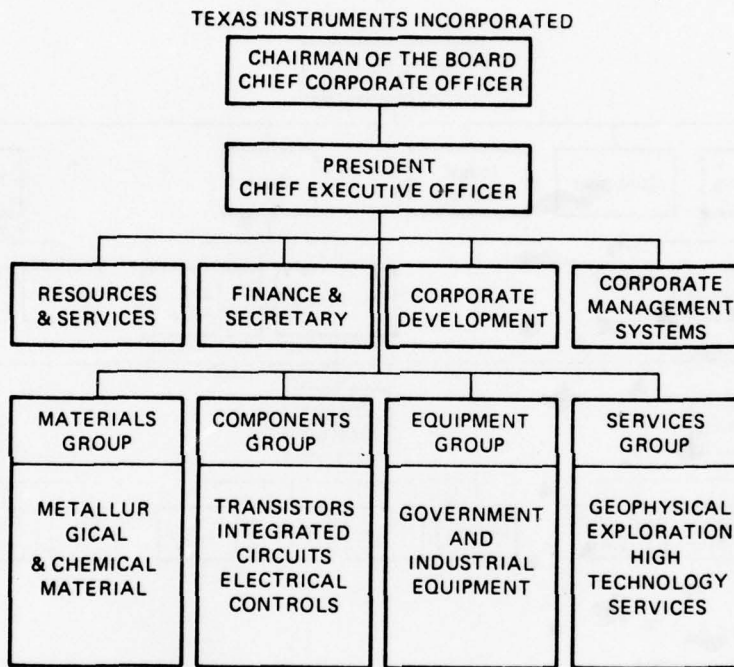


Figure 23: The Basic Organization Structure at Texas Instruments

Source: J. Galbraith and D. A. Nathanson, Strategy Implementation: The Role of Structure and Process, West Publishing Co., St. Paul, MN, 1978.

archical level, which is accomplished through a great deal of committee activity. However, the resulting lack of autonomy among the groups is more than compensated for by the ability of the organization to quickly transfer any technological improvement in either materials, components, or subassemblies to all the relevant product lines. This has allowed Texas Instruments to have an extraordinary capacity to compete successfully in products in which they have not been the initial innovators, such as electronic calculators. The organization structure suggests that the primary strategic focus of TI is not restricted to a narrowly defined set of products, but its concern is rather with the effective use of a common technological base to manufacture and market products characterized by a very short life-cycle.

The TI structure is further broken down into divisions and departments, these being organized as profit centers. In order to achieve a strategic focus within that basic structure, an interesting matrix is established by crossing operational line responsibilities, and strategic action programs (see Figure 24). The strategic responsibilities are formulated in terms of objectives, strategies, and tactics (OST). Each broad strategic objective is supported by a number of strategies specifically conceived to guarantee that this objective is achieved. In turn, each strategy is expressed in more concrete terms as a set of well defined tactical programs. The responsibility for the correct execution of a tactical program is given to a Department Head. In the example of Figure 24, tactical program 4 has been assigned to the Head of Department 2. The responsibility for a specific strategy may fall at departmental, divisional, or group level, depending on the tactics that go with that strategy. If the responsibilities for those tactics fall with a unique Department Head, he is made accountable for the

Operational Responsibilities		Group A					
		Division 1			Division 2		
Strategic Responsibilities		Dept. 1	Dept. 2	Dept. 3	Dept. 4	Dept. 5	Dept. 6
Objective 1	Strategy 1	Tactical Program 1	x				
		Tactical Program 2	x				
		Tactical Program 3	x				
	Strategy 2	Tactical Program 4		x			
		Tactical Program 5	x				
		Tactical Program 6			x		

Figure 24: A Matrix Structure Linking Operational and Strategic Responsibilities

strategy in question. For example, in Figure 24, tactics 1, 2, and 3 have been assigned to Department 1; therefore, the head of that department is responsible also for strategy 1. Similarly, we can see that the Head of Division 1 is made accountable for strategy 2, because he is the lowest level with full control over the tactics that accompany that strategy. It is important to emphasize in this example that a matrix form of organization can result not only as the traditional intersection between products and functions, but also as the crossing of strategic and operational responsibilities.

The definition of a basic structure is the central point in the organization design process, because it provides the frame in which the organization is going to develop its strategic and operational activities. In other words, the performance of the organization is largely determined by the choice of a basic structure.

Most likely, at the end of this step the managerial team will not be able to make a final selection. More than one basic segmentation may fit well with the needs of the firm under the premises of this broad analysis. Consequently, the result from this initial effort may be more than one basic organization structure, whose characteristics need to be further analyzed to come out with a final decision.

5.2 Detailed Organization Design

The objective sought in the detailed organization design phase is twofold: to identify all the operational tasks the organization should undertake in the pursuit of its daily activities, and to assign those tasks to the major organizational segments identified in the basic structure previously defined. The basic structure brings the selected strategy into the design process, while the detailed analysis comes to recognize the operational

centralized functional activity (such as marketing or distribution), and the presence of a local demand at the divisional level might call for a functional liaison individual reporting to the centralized functional manager, but subordinated to the divisional manager.

Many questions surge naturally from people familiar with the organization to test the responsiveness of its structure against a multitude of situations that are important to consider. For example, one might ask how a request from an individual customer located in a remote area for a specific product or service would be handled under the proposed structure. If, when answering that question, one detects ambiguities, lack of efficiency, or undesirable splitting of responsibilities, some structuring overhauling would have to be performed.

More specifically, some questions to be addressed are:

If the organization is mainly functional,

- How to insure that products are given their share of attention?
Are integrating managers necessary in the role of product directors?
- Should the marketing function be subdivided by product? by client?
by region? Should sales be centralized or regionalized?
- How should the production function be subdivided? by plants?
by production stages? by products? by geographical regions?
- How R&D is going to interact with the engineering and the production functions?
- How distribution would be responsive to local requests for delivery of products manufactured in several plants?

If the organization is mainly divisionalized around product lines,

- Which functions should be centralized and which decentralized?
- For centralized functions, should they report to the C.E.O. or to a lower hierarchical level?

- If plants, distribution facilities warehouses, and resources in general, are shared by more than one product line, who is in charge of them? How to insure that each division obtains a fair treatment?
- How to deal with regional affairs?
- Are there special clients that require preferential attention? How to handle these situations?

Along the more detailed analysis performed for each one of the alternative structural designs, some of the options will be discarded from further consideration, because of undesirable characteristics surfaced by this more careful inquiry. In the end, only two or three alternatives should be competing. For the final selection, the detailed analysis performed in this step provides a visceral understanding of the strategic and operational implications for each design under scrutiny.

5.3 Balance Between Organization Structure and Managerial Processes

The positioning of units and subunits of the organization in an ordered hierarchical network must be completed with the definition of all complementary managerial systems. The full fledged operations of these systems provide a background of integrative relationships that the simple organization structure fails to represent. Moreover, these systems must be designed both to reinforce the primary focus chosen by the organization, and to support those activities relegated to a secondary level in the definition of the organization structure. For example, a planning system in a functional organization must be specially sharp in the definition of strategic business units, because the primary structure does not give sufficient weight to the identification of businesses the firm is engaged in, and this may weaken the long term strategic positioning of the firm. On the other hand, the segments

defined in divisional organizations are more long-term oriented, but the operational efficiency is enhanced by giving ample autonomy to the divisional manager and by linking his rewards with the divisional performance. In this way, some balance and some alignment is established between the long and short term concerns.

Galbraith and Nathanson [10] provide a complete description of the characteristics that all managerial systems are supposed to have for some of the organization types they define: simple functional, centralized functional, multidivisional, holding, global multidivisional (see Figure 25). The point to notice is that the need exists to adjust the characteristics given to the structure and the managerial processes.

A similar point has been made by firms like the Boston Consulting Group and Arthur D. Little. They suggest that the characteristics of a business are largely dictated by life-cycle considerations. The most natural strategies are: promotion in the introductory phase, investment in the growth phase, milking in the maturity phase, and harvest for withdrawal in the decay phase. The notion is that a different strategy is needed for each stage in the life-cycle; and, consequently, a special organization structure, managerial style, and set of skills are required to manage a business through its economic life. Figure 26 presents what Arthur D. Little [1] suggests is a balanced set of requirements in each stage of the product life.

To conclude, we can say that the design of all managerial support systems, the actual selection of a managerial leadership, and the degree of formality in each organizational unit must be fitted to the basic and detailed structures selected, and to the strategic and operational considerations that suggested that organization structure in the first place.

TYPE	⑤ Simple	⑥ Functional	⑦ Holding	⑧ Multi-Divisional	⑨ Global—(M)
CHARACTERISTIC					
Strategy	Single Product	Single Product and Vertical integration	Growth by Acquisition unrelated diversity	Related diversity of product lines—internal growth some acquisition	Multiple products in multiple countries
Inter-unit and Market Relations					
Organization Structure	Simple functional	Central functional	Decentralized Profit Centers around product divisions Small Headquarters	Decentralized Product or area division profit centers	Decentralized profit centers around World wide product or area divisions
Research and Development	Not institutionalized Random search	Increasingly institutionalized around product and process improvements	Institutionalized search for new products and improvements—Decentralized to divisions	Institutionalized search for new products and improvements—Centralized guidance	Institutionalized search for new products which is centralized and decentralized in centers of expertise
Performance Measurement	By personal contact subjective	Increasingly impersonal based on cost, productivity but still subjective	Impersonal based on return on investment and profitability	Impersonal based on return on investment profitability with some subjective contribution to whole	Impersonal with multiple goals like ROI, profit tailored to product and country
Rewards	Unsystematic paternalistic based on loyalty	Increasingly related to performance around productivity and volume	Formula based bonus on ROI or profitability Equity rewards	Bonus based on profit performance but more subjective than holding—Cash rewards	Bonus based on multiple planned goals More discretion Cash rewards
Careers	Single function specialist	Functional specialists with some generalist-interfunctional moves	Cross function but intra-divisional	Cross functional inter-divisional and corporate-divisional moves	Interdivisional Interunitary/Corporate moves
Leader Style and Control	Personal Control of strategic and operating decisions by top management	Top control of Strategic decisions Some delegation of operations, three plans, procedures	Almost complete delegation of operations and strategy within existing businesses Indirect control three results and selection of management and capital funding	Delegation of operations with indirect control three results Some decentralization of strategy within existing business	Delegation of operations with indirect control three results according to plan Some delegation of strategy within countries and existing business Some political delegation
Strategic Choices	Need of owner vs. needs of firm	Degree of integration Market share Breadth of Product line	Degree of diversity Types of business Acquisition targets Entry and Exit from businesses	Allocation of resources by business Exit and Entry from businesses Rate of Growth	Allocation of resources across businesses and countries Exit and entry into businesses and countries Degree of ownership and type of country involvement

Figure 25: Managerial Characteristics of Each Type of Organization Structure

Source: J. Galbraith and D. A. Nathanson, Strategy Implementation: The Role of Structure and Process, West Publishing Co., St. Paul, MN, 1978.

<u>Management Activity or Function</u>	<u>Embryonic Industry</u>	<u>Growth Industry</u>	<u>Mature Industry</u>	<u>Aging Industry</u>
Managerial Role	Entrepreneur	Sophisticated market manager	Critical administrator	"Opportunistic milker"
Planning Time Frame	Long enough to draw tentative life cycle (10)	Long-range investment payout (7)	Intermediate (3)	Short-range (1)
Planning Content	By product/customer	By product and program	By product/market/function	By plant
Planning Style	Flexible	Less flexible	Fixed	Fixed
Organization Structure	Free-form or task force	Semi-permanent task force, product or market division	Business division plus task force for renewal	Pared-down division
Managerial Compensation	High variable/low fixed, fluctuating with performance	Balanced variable and fixed, individual and group rewards	Low variable-high fixed group rewards	Fixed only
Policies	Few	More	Many	Many
Procedures	None	Few	Many	Many
Communication System	Informal/tailor-made	Formal/tailor-made	Formal/uniform	Little or none, by direction
Managerial Style	Participation	Leadership	Guidance/loyalty	Loyalty
Content of Reporting System	Qualitative, marketing, unwritten	Qualitative and quantitative, early warning system, all functions	Quantitative, written, production oriented	Numerical, oriented to written balance sheet
Measures Used	Few fixed	Multiple/adjustable	Multiple/adjustable	Few/fixed
Frequency of Measuring	Often	Relatively often	Traditionally periodic	Less often
Detail of Measurement	Less	More	Great	Less
Corporate Departmental Emphasis	Market research; new product development	Operations research; organization development	Value analysis Data processing Taxes and insurance	Purchasing

Figure 26: Managerial Characteristics by Stage of Product-Life Cycle

Source: Arthur D. Little, Inc., A System for Managing Diversity, Cambridge, MA, December 1974.

6. A Case Study

This section describes an effort to revise the existing organization of a Company, which is wholly-owned by a U. S. Corporation. The Company has been engaged primarily in the sales, service, and distribution of large and small Equipment, which in turn were manufactured and developed by another Company belonging to the same Corporation. That Equipment is sold to a variety of commercial, industrial, and government markets. The Equipment needs special types of Chemical products as primary inputs for its operation. The Equipment also needs specialized Computer Systems support.

To maintain the confidentiality of the information pertaining to this case, all the specific characteristics of the business of the Company have been altered.

6.1 Brief Discussion of the Existing Organization

The primary organization structure of the Company is presented in Figure 27. Initially the Company was organized according to a pure functional form, where the managerial functions represented were Distribution, Sales, Services (all of them included under the Regional Centers), Marketing, and Financial Control. Manufacturing and Research and Development were not part of the Company's activities. Those functions were represented within other sister Companies of the Corporation.

However, as time passed, new responsibilities were added to the Company. Primarily, among them, was the acquisition of Computer Systems, Inc., involved in data management businesses. This new unit constituted an autonomous business, managed in a completely decentralized way, with self-sufficient functional support which included Research and Development

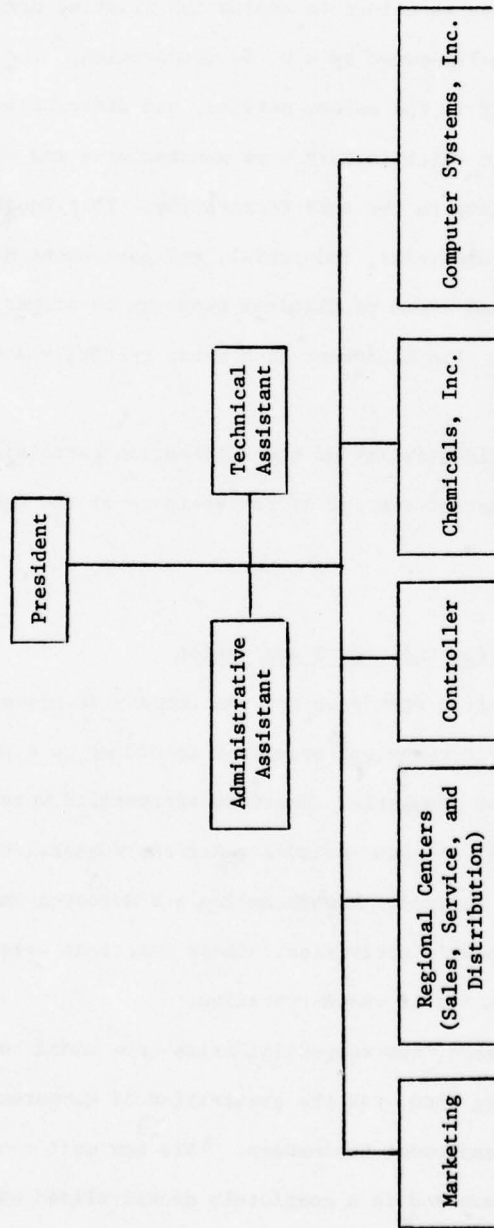


Figure 27: Existing Organization

and Manufacturing.

Moreover, the Company acquired a small firm, Chemicals, Inc., with Manufacturing and Research and Development capabilities for the chemical products needed to operate the major Equipment.

These two acquisitions provided an integrated capability of the Company's businesses. Now, the Company was not only able to distribute, sell, and service major Equipment, but also manufacture, develop, and market the Chemicals and Computer Systems to support the Equipment's operation.

Finally the Company began to expand its international operations into Canada and Mexico. This introduced an international concern that did not exist in the original organization structure. Obviously, these new responsibilities seriously affected the organization structure of the Company, changing it from a functional organization into a hybrid organization with functions, products, and international dimensions.

Even more important, new developments are expected in 1979. Among them we can cite the possible expansion of activities in Central and South America, the absorption of two new business concerns, and a significant projected growth in almost all product lines.

Furthermore, potential new acquisitions are under consideration for the near future. All of these events triggered a serious concern on the part of the top management of the Company to critically review the present organization structure and to propose more effective organization alternatives.

Figures 28 and 29 provide the organization charts describing the existing structure of the Regional Centers and Computers Systems, Inc., respectively. It is worth noticing that the Regional Centers are the

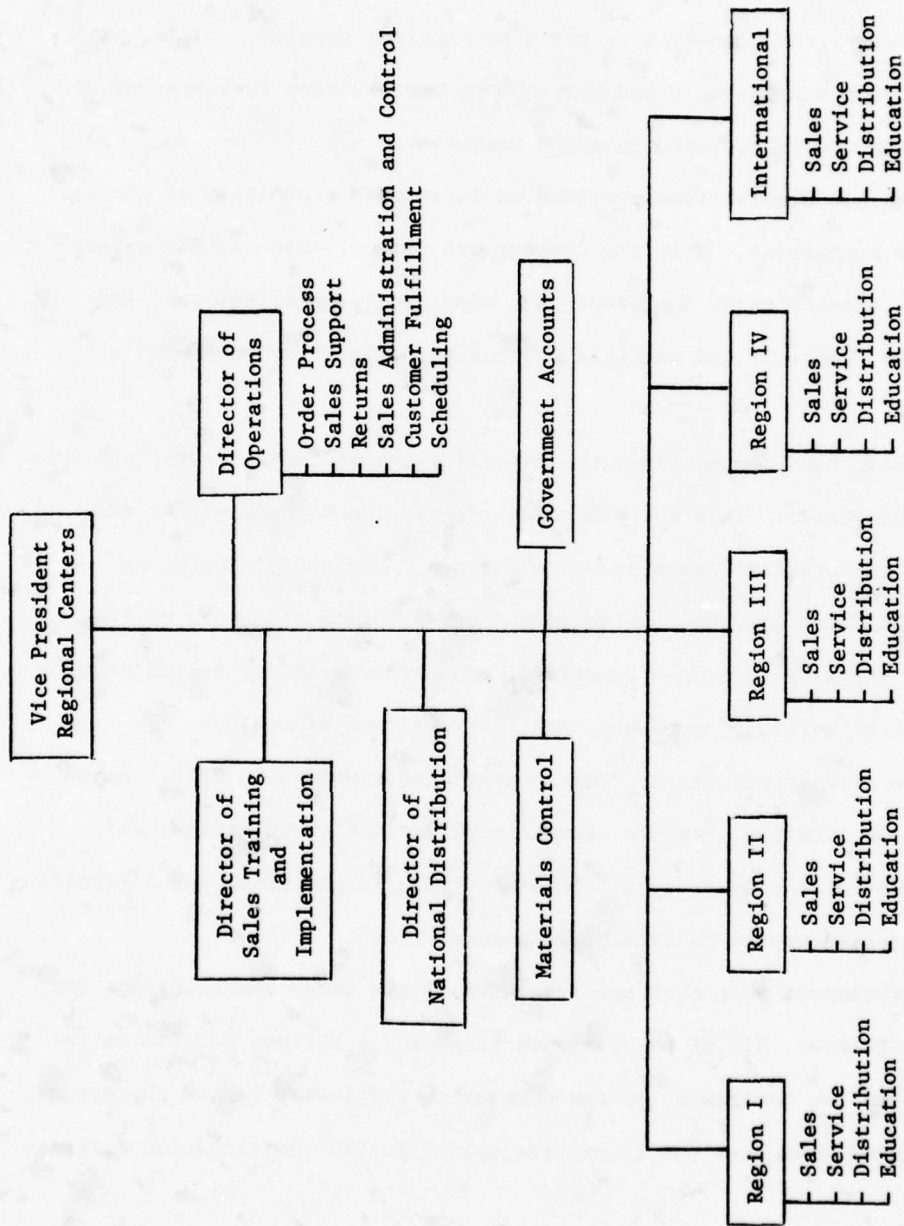


Figure 28: Existing Organization of Regional Centers

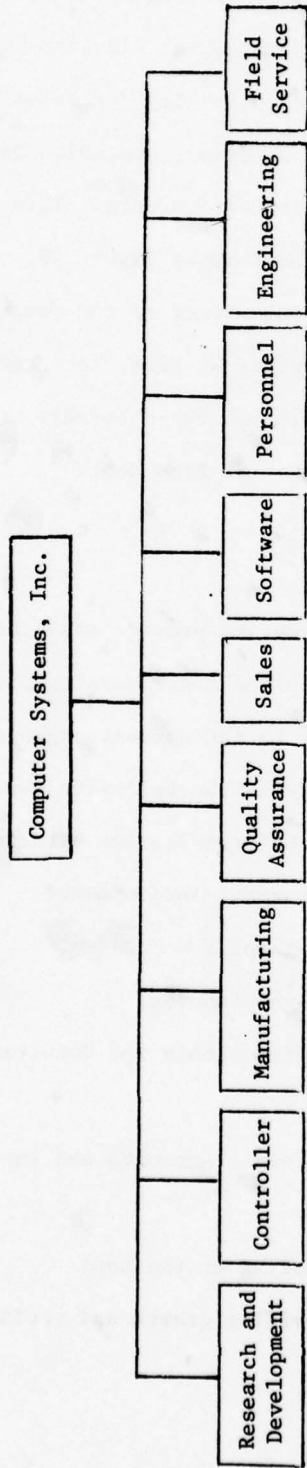


Figure 29: Existing Organization - Computer Systems, Inc.

fundamental operational core of the Company, including not only a regionalized Sales, Service, and Distribution coverage, but also the Regional Center Vice President has a centralized responsibility for Sales Training and Implementation, National Distribution, Materials Control, Government Accounts, and the overall management of customers' orders. This is clearly evident in the organigram of the Regional Centers of Figure 28. Also important to reemphasize is the self-standing nature of the Computer Systems, Inc. organization given in Figure 29. Computer Systems, Inc. can and does operate as an independent business unit with all the necessary managerial functions reporting to the Computer Systems Vice President.

6.2 Critique of the Existing Organization

The first task undertaken in our attempt to provide organization alternatives for the Company was to reflect upon the most pressing problems of a general nature that could be traced back to the current organization structure. A consensus emerged in identifying the following issues as the most important to be addressed in a proposed organization structure:

- a) lack of opportunities for general management development;
- b) too much concentration on operational issues;
- c) lack of definition in portfolio business planning;
- d) lack of coordination with other Companies within the Corporation;
- e) intensive antagonistic environment;
- f) neglect of special markets (e.g. government accounts and international business accounts);
- g) excessive concentration of decision making at the top;
- h) organization not appropriate for maximizing growth and profit;
- i) overworked key personnel.

Items a) and g) are typical of a functional organization. All of the issues listed above not only reveal problems that result from an inappropriate organization structure, but also eloquently point out the need for an organization structure that better permits the development of a formal strategic and operational planning system. Such a system should balance the long term concerns of the Company with the proper pressures for short term performance.

6.3 Primary Criteria for the Design of a New Organization

In order to determine the basic segmentation of responsibilities in an organization, one is forced to select one dimension which is perceived to be the dominant force of the organization activities. In this case, we believe that there are three primary dimensions that could be candidates for this focus of attention. These dimensions are:

- a) functions;
- b) business segments;
- c) geographical areas.

a) Functions

Selecting the function as the dominant criteria for structuring an organization leads to the classical functional organization form whose characteristics were addressed in Section 3.1.

b) Business Segments

The selection of business segments as the dominant dimension for organization design allows for an effective exploitation of the opportunities which might be available in each individual business segment. A business-focused organization leads to a divisionalized segmentation of the organi-

zation, in which every division is relatively autonomous in an operational sense. The division then becomes a self-sustaining business in its own right, having a legitimate business climate which allows for the identification of genuine profit centers. Each individual business unit cannot only operate efficiently in the day to day operations, but can carry on effectively long term strategic actions pertaining to the development of each individual business. Thus, each business division provides an excellent training ground for the development of general managers. The top manager of the organization is significantly relieved from the routine operational tasks and can therefore exercise a much more meaningful role in planning the business portfolio and overall divisional growth.

This form of organization allows for the strategic development of each major business of the Company, either by internal growth or by the consolidation of new acquisitions into the appropriate business segments.

c) Geographical Areas

For organizations covering wide geographical territories with a strong need for maintaining a high level of services responsive to the individual idiosyncrasies of each area, a geographical divisionalized organization could be appropriate. Thus, the basic segmentation results in regional managers who, when taken to an extreme, can be in total control of all the functions and businesses in their own region.

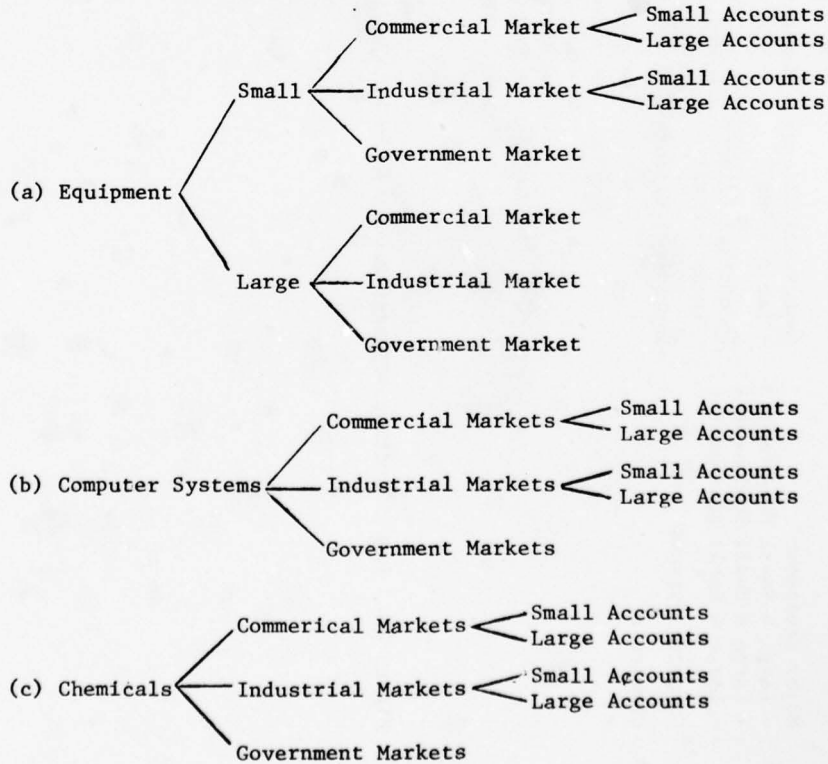
As is apparent from this very brief discussion, an organization structure in a complex situation normally does not have a single dominant dimension, but rather becomes a hybrid structure. In such a structure, some centralized functions can report directly to the President, some regionalization focus can emerge either at the first or second organizational level,

and some business divisions can also be reported to the President.

6.4 Identification of the Critical Dimensions for the Company's Organization

As a first attempt to single out the organization dimensions relevant to the Company, we constructed a list of the major products, markets, locations, and functions represented in the current Company's activities. That list is given in Figure 30.

Furthermore, in order to define the major business segments of the Company, we constructed a matrix of products and markets, which is shown in Figure 31. From that Product-Market segmentation it became clear that the primary businesses could be characterized as follows:



<u>Products</u>	<u>Markets</u>	<u>Locations</u>	<u>Functions</u>
Major Equipment	Commercial Clients	Markets	Marketing
- Large & Small Equipment A	- Large & Small	- USA	Sales
- Large & Small Equipment B	Industrial Clients	- Canada	Distribution
- Large & Small Equipment C	- Large & Small	- Mexico	Manufacturing
Computer Systems	Government Clients	- Central America	Research & Development
Chemicals		- South America	Finance
		Plants	Service
		- Detroit	Education & Training
		- Los Angeles	Project Engineering
		- Boston	
		- New Orleans	

Figure 30: Identification of Major Products, Markets, Locations, and Functions

Market Products	Commercial Clients		Industrial Clients		Government Clients
	Large	Small	Large	Small	
Large Equipment A	x		x		x
Large Equipment B	x		x		x
Large Equipment C	x		x		x
Small Equipment A	x	x	x	x	x
Small Equipment B	x	x	x	x	x
Small Equipment C	x	x	x	x	x
Computer Systems	x	x	x	x	x
Chemicals	x	x	x	x	x

Figure 31: Identification of Product-Market Segments

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Notice that a business is not necessarily a product line. In the case of Equipment, it is important to distinguish both Large and Small Equipment, as well as Commercial, Industrial, and Government Markets, each of them split into Small and Large Accounts. This segmentation allows managers to detect the different opportunities that each business offers.

Finally, the Company's President provided his own personal objectives for the design of an alternative organization form. His instructions were as follows:

- a) permit a shift of the President's time from routine day to day decisions to actions pertaining to business development and strategic planning;
- b) organize to facilitate absorption of new acquisitions;
- c) do not break new businesses;
- d) allow for the development of general managers.

Statements a) and d) clearly eliminate the pure functional form as an organization alternative. Moreover, statements b) and c) can be interpreted as favoring a business divisionalized form.

6.5 Design of a Basic Organization Structure: The Selection of Leading Alternatives

As we had indicated in Section 5, the first step in the organization design process is the recognition of competing forms for the basic organization structure. This structure identifies the primary echelons of the organization chart which are linked to the strategic positioning of the firm.

We recognized four major alternatives for the basic organization structure of the Company. These alternatives are:

- a) Alternative Organization Based on Primary Businesses

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- b) Alternative Organization Based on a Centralized Sales, Service, and Distribution Function
- c) Alternative Organization with Geographical Regions and Business Segments
- d) Alternative Organization with Geographical Regions and Centralized Manufacturing

These basic organization alternatives are presented in Figures 32, 33, 34, and 35, respectively.

Obviously many other alternatives were discussed in the first stage of our study. However they were discarded after a more in-depth analysis because they were clearly dominated by either one or more of the four basic alternatives indicated above.

We will now proceed to briefly comment on the salient characteristics of each of the leading basic structure alternatives.

a) Alternative Organization Based on Primary Businesses

The heart of this alternative (see Figure 32) is the identification of three primary autonomous businesses: Computer Systems, Chemicals, and Equipment. Although these businesses are closely related to one another, the adoption of this organization form might contribute to the realization of opportunities unique to each individual segment. That is to say, that Chemicals and Computer Systems not only will be developed to satisfy the important role they should play in supporting the Equipment operation, but they can also seek penetration in other markets, not necessarily tied to the Equipment business environment. The strategic implications of adopting this organization form are enormous. It means that the Company will no longer view itself as being solely in the business of Equipment, but as being in three autonomous, although related, business segments.

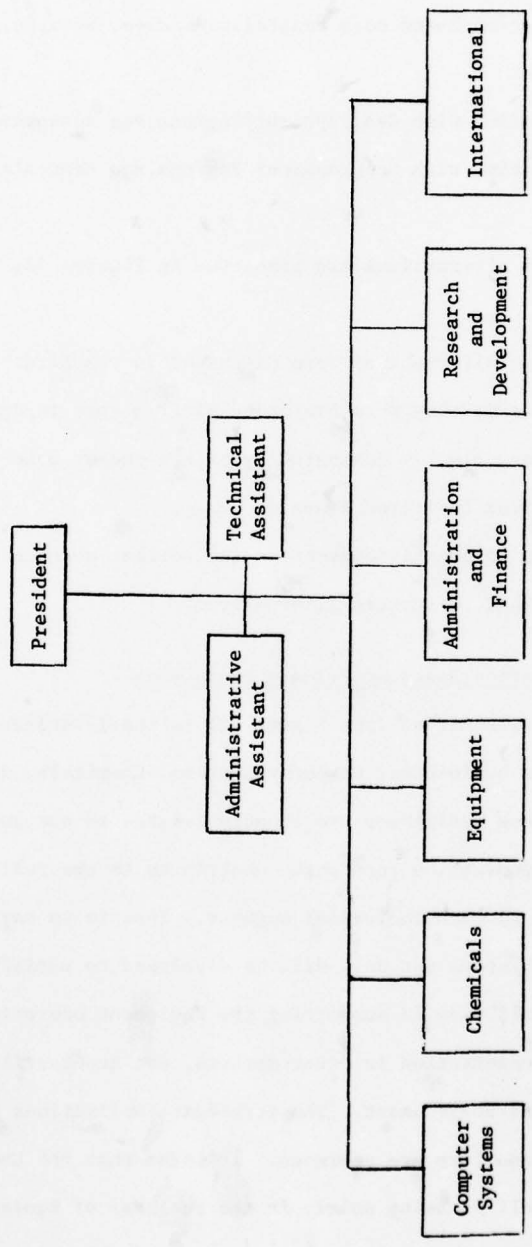


Figure 32: Alternative Organization Based on Primary Businesses

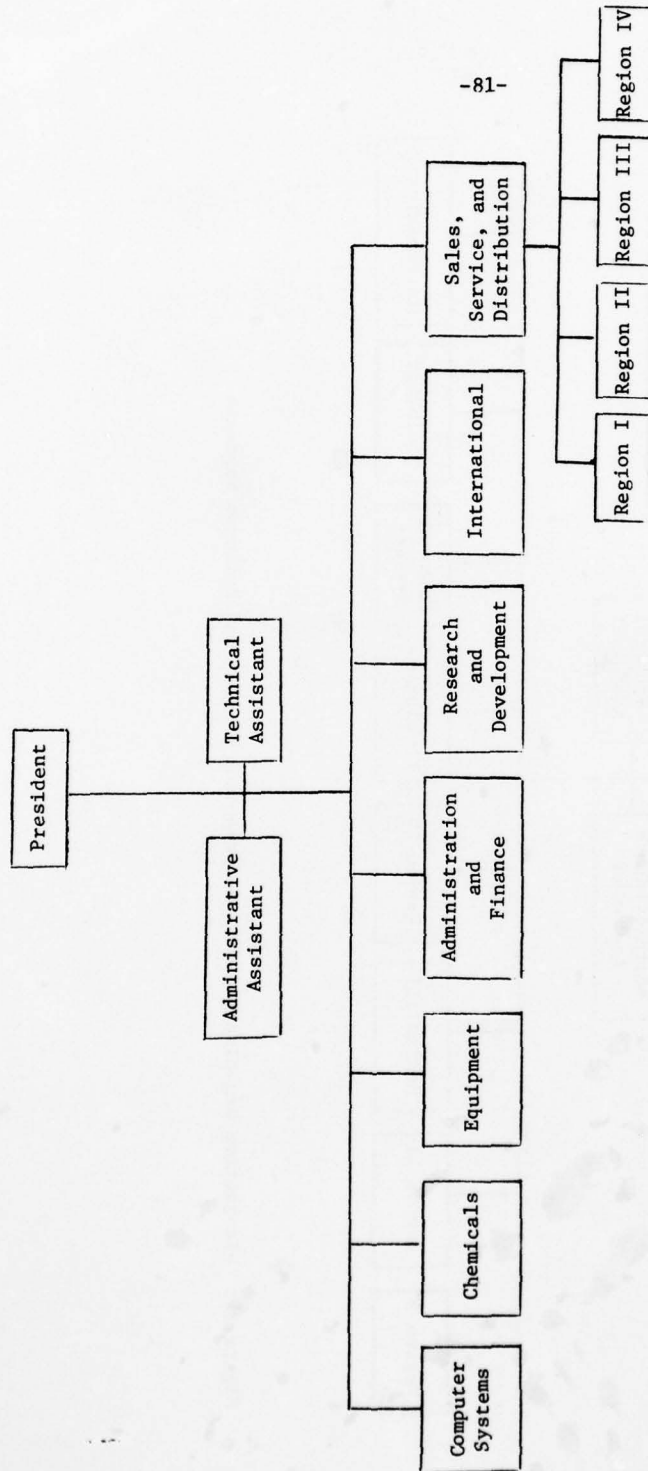


Figure 33: Alternative Organization Based on a Centralized Sales, Service, and Distribution Function

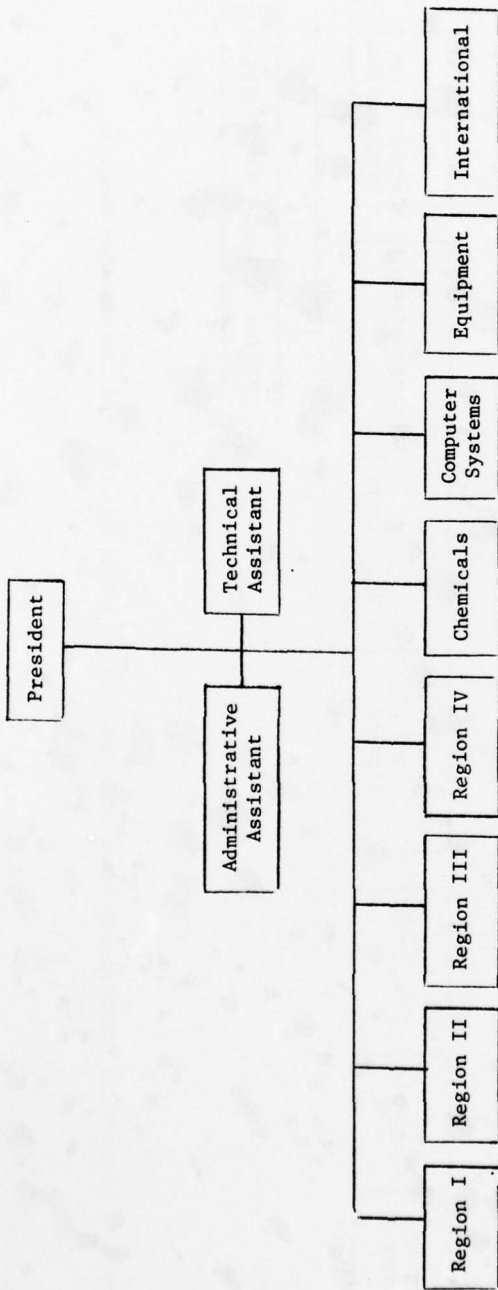


Figure 34: Alternative Organization with Geographical Regions and Business Segments

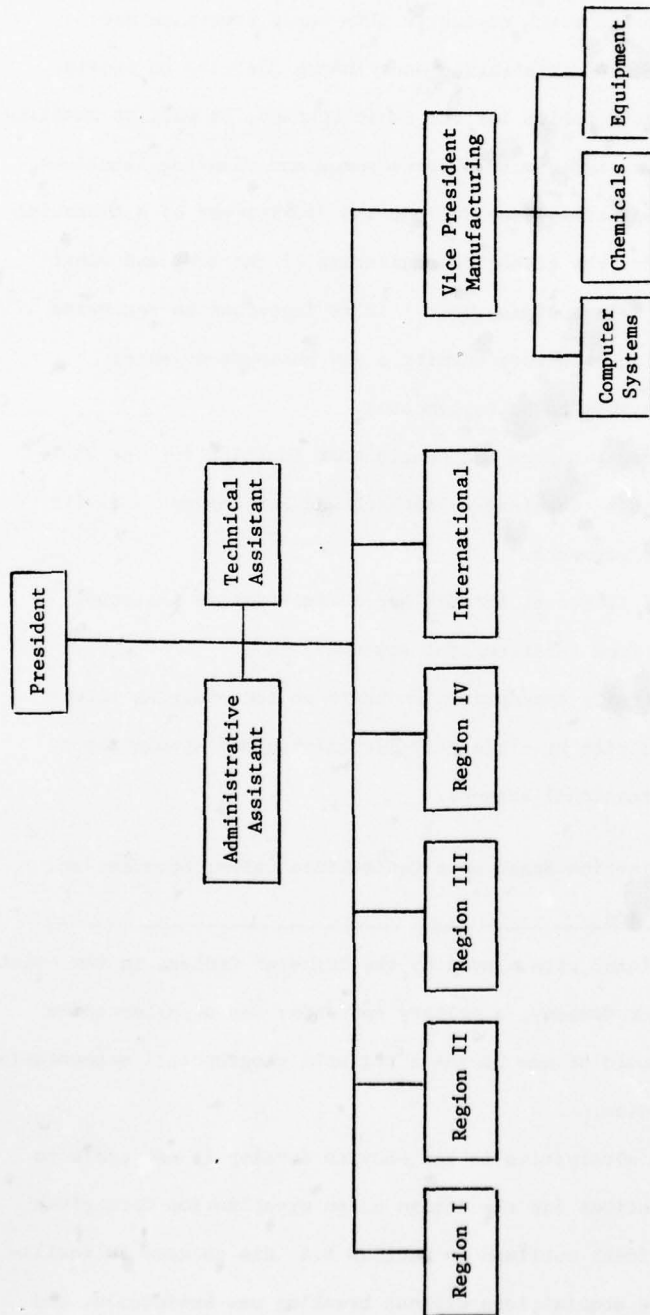


Figure 35: Alternative Organization with Geographical Regions and Centralized Manufacturing

Other characteristics worth noting in this basic structure are:

- There is a centralized Administration and Finance function to provide the normal Controller's duties for the whole Company, as well as handling centralized personnel, and business development and planning functions. The Controller's responsibilities include the development of a financial system that allows for the effective monitoring of the long and short term performance of each business unit. It is important to recognize that this organization structure permits a new business-oriented management control system to be implemented.
- There is a centralized Research and Development function for the whole Company to facilitate a coordinated Research and Development activity for all its business segments.
- The staff offices of Technical Affairs and Administrative Assistant are kept unmodified from their current status.
- This organization permits appropriate emphasis on the emerging international responsibilities by ultimately identifying and appointing a manager for an International segment.

b) Alternative Organization Based on a Centralized Sales, Service, and Distribution Function

Given the predominant role played by the Regional Centers in the existing organization of the Company, a primary contender for an alternative basic organization should be one having a regional geographical segmentation as its dominant dimension.

However, such an alternative is not easy to develop if one wants to respect the four objectives for the design of an organization form given by the Company's President outlined in Section 6.4 His concern to facilitate absorption of new acquisitions without breaking new businesses, and

his determination to adopt a structure that would facilitate the strategic development of the major businesses of the Company makes it desirable for us to maintain a segmentation focus having Computer Systems, Chemicals, and Equipment as primary units. Therefore, a geographical focus can be brought in by establishing a centralized Sales, Service, and Distribution function that has a geographical segmentation. That function would serve a purpose quite similar to the existing Regional Centers, but under a business-oriented organization structure.

Figure 33 describes the first two hierarchical levels of such an organization. The comparisons of Figure 33 with the organization alternative based on primary businesses, depicted in Figure 32 simply shows the addition of a new centralized function, while preserving all the other organization units. However, the reader should realize that there are fundamental differences in the way in which the Company will operate, both in the short and the long run, under these two organization forms.

The organization alternative that has a centralized Sales, Service, and Distribution function (Figure 33) allows for a comprehensive geographical regionalization, which generates the following major advantages:

- It provides a single Company's image to all customers.
- It permits better coordination among the various businesses of the Company in the interface with customers.
- It assures efficiency at the operational level.
- It is consistent with the current Regional Center concept, and, therefore, would encounter less resistance in its implementation.

However, the major disadvantages of the geographical regionalization alternative relative to the business-oriented organization (Figure 32) are:

- It divides managerial accountability between Sales, Service, and Distri-

bution on the one hand, and the business segments on the other. This makes sound management control principles very hard to apply.

- There is a loss of strategic focus for specific business development, since the business units do not possess complete autonomy in Sales, Service, and Distribution.
- It forces newly acquired, self-standing businesses to be broken.
- The Company President would have to play a very strong integrating role to coordinate the operational activities of the business units with the centralized function of Sales, Service, and Distribution. This will prevent a major concentration of the President's time to the strategic directions of the Company.

It should be clear from the above remarks that the business-oriented segment organization alternative responds more effectively to the criteria that were proposed as the basis for a new organization, particularly with respect to allowing for a strong strategic focus for business development.

c) Alternative Organization with Geographical Regions and Business Segments

Figure 34 shows a segmentation based on four major geographical regions and the three basic business units: Computer Systems, Chemicals, and Equipment. This alternative c) is dominated by alternative b) - the centralized Sales, Service, and Distribution function - which reduces the span of control of the Company President and separates him from the operational routines of running the day to day activities of the Regional Centers.

Since our previous analysis suggested a strong preference for alternative a) - based on a business-oriented segmentation - over alternative b), we can abandon alternative c) from any further consideration.

d) Alternative Organization with Geographical Regions and Centralized Manufacturing

Figure 35 shows an organization alternative that preserves the four Regional Center managers, but has the three basic business units reporting to a Vice President of Manufacturing. This alternative would make the Computer Systems, Chemicals, and Equipment businesses simply cost centers in charge of providing the goods to be required by the Regional Center managers. We discarded this alternative since it would have unduly emphasized the operational concerns of the Company, sacrificing its strategic business focus.

We have provided only a synoptic description of the arguments that were given to support our final recommendation to adopt the business-oriented organization for the Company. In the actual study we examined in detail all the four basic alternatives discussed above.

6.6 Detail Design: Description of Each Organization Unit of the Business-Oriented Alternative

Having selected a preferred basic organization structure, the second step in the design process is the definition of the associated detail organization structure.

We will now limit ourselves to provide some brief comments to characterize the nature of each of the units reporting to the President of the Company under the alternative organization based on primary businesses (see Figure 32).

a) Computer Systems

Figure 36 shows the proposed organization chart for the Computer

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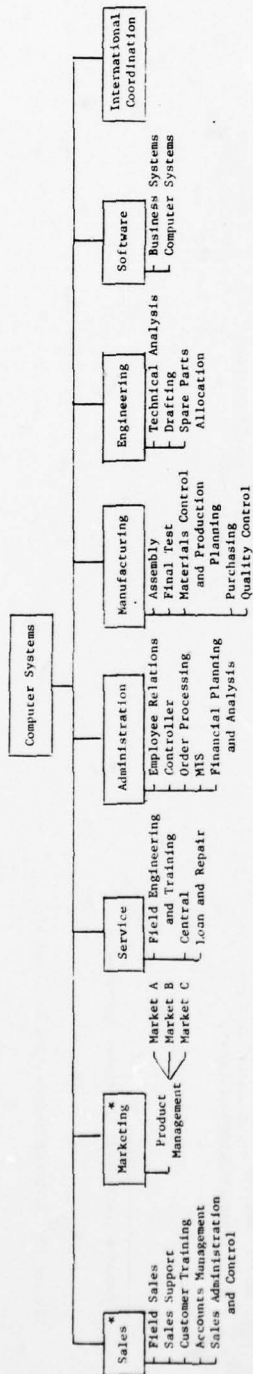
Systems business. Since Computer Systems has been operating already as a self-sustaining unit, its organization does not change significantly. It is proposed that in the future, Sales and Marketing would be combined in a single sub-unit, which would both improve the necessary coordination of these functions, as well as reduce the span of control of the Computer Systems Vice President.

b) Chemicals

Figure 37 presents the organization chart for the Chemicals segment. The most important element to bear in mind is that the Advertising and Distribution Management functions reporting to the Vice President of Chemicals not only serve those functional needs for the Chemicals business, but also are centralized functions for Computer Systems and Equipment. We could have opted for a centralized functional structure reporting directly to the President. We rejected that alternative because it would have loaded the President with operational responsibilities. Since Chemicals is the business that most heavily needs Distribution and Advertising support, it was an obvious choice to assign those centralized functions to Chemicals.

c) Equipment

The Equipment organization chart (see Figure 38) singles out a unit responsible primarily for manufacturing Small Equipment. The remaining functions (Sales and Services, Marketing, Management Development and Training, and Administration) are common for both Small and Large Equipment. At least for the time being, Large Equipment will still be produced and developed by a sister company. This explains the absence of Manufacturing, and Research and Development for Large Equipment.



* Sales and Marketing could be combined, which will reduce the span of control of the Computer Systems Vice President

Figure 36: Proposed Organization for Computer Systems

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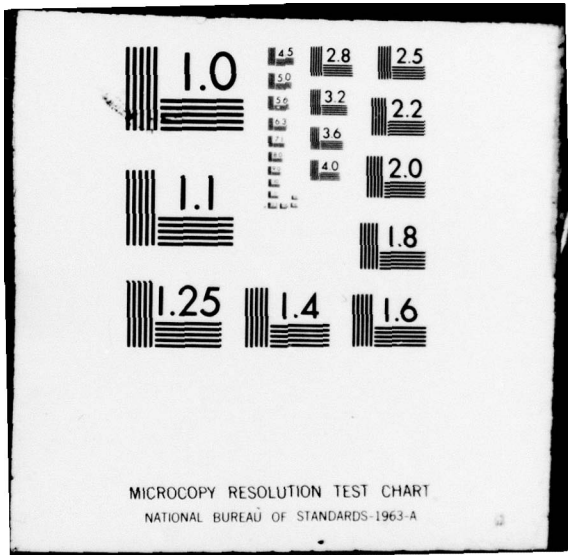
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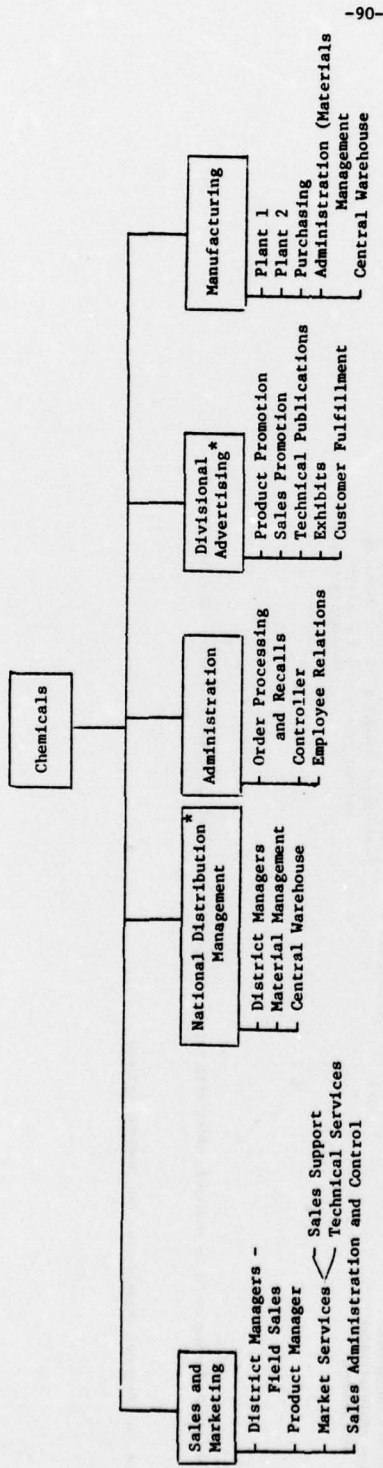
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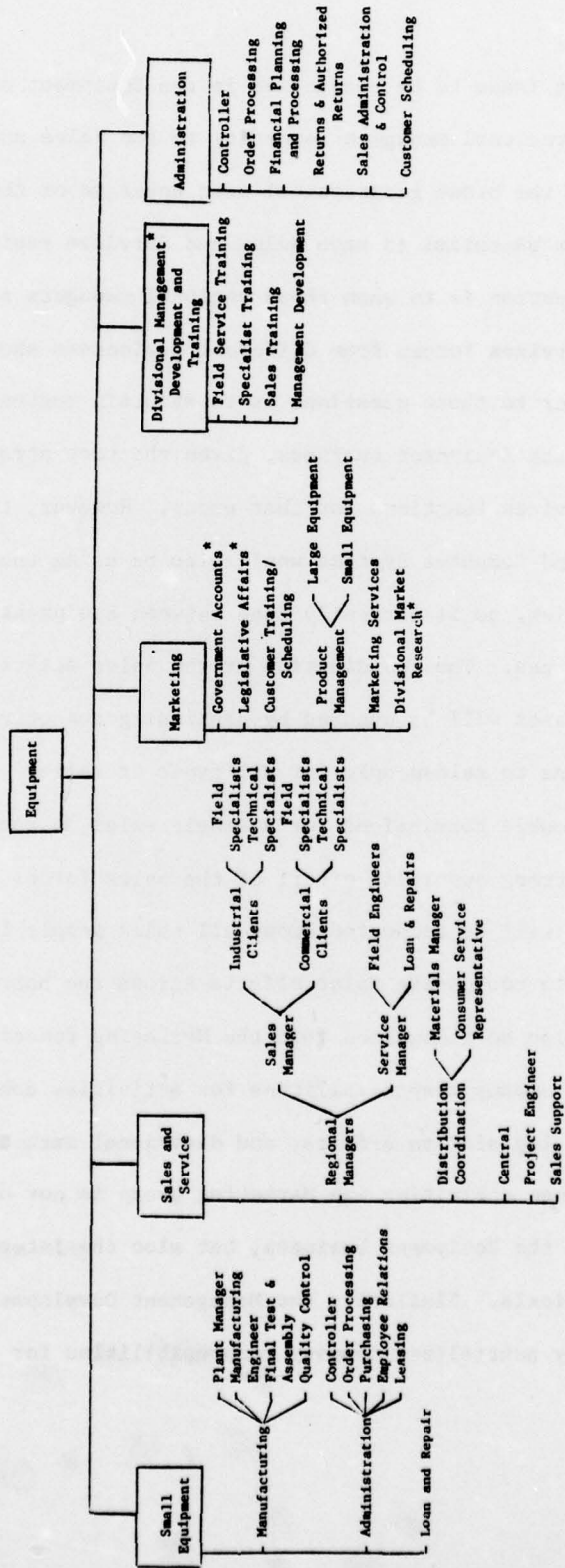
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* Denotes centralized divisional functions

Figure 37: Proposed Organization for Chemicals



* Denotes centralized divisional functions

Figure 38: Proposed Organization for Equipment

An important issue to be recognized in the Equipment organization is the presence of regional managers reporting to the Sales and Services unit. Naturally, given the broad geographical area coverage of the Company's activities, it is essential to have Sales and Services regional managers' offices. The question is to whom those regional managers should report and how Sales and Services forces from different businesses should be coordinated. The answer to those questions is to maintain regional managers subordinated to the Equipment business, given the very strong importance of Sales and Services functions for that group. However, the Sales forces from Chemicals and Computer Systems would also be using those regional physical facilities, as is currently done between Equipment and Computer Systems Sales forces. The coordination of the Sales activities between different businesses will be assured by continuing the current practice of giving commissions to salespeople for all types of sales. This allows for the payment of double commissions for a single sales as necessary, and so preserves a strong supporting effort of the Sales force. In addition, monthly meetings will be conducted among all sales people in a given regional office to coordinate sales efforts across the board in that region.

It should also be recognized that the Marketing function of Equipment has centralized Company responsibilities for activities concerning: governmental accounts, legislative affairs, and divisional market research. This means that in those activities the Marketing group is not only overseeing the interests of the Equipment business, but also the interests of Computer Systems and Chemicals. Similarly, the Management Development and Training group has equally centralized Company responsibilities for that particular function.

d) Administration and Finance

Figure 39 describes the proposed organization chart for Administration and Finance. It is important to recognize that this function has been expanded beyond the traditional Controller's responsibility, by adding an Office of Business Development and Planning for the whole Company. This Office will play an essential role in establishing the processes, practice, and tools to facilitate the implementation of the strategic and operational planning system of the Company.

e) Research and Development

The proposed organization chart for the Research and Development function is presented in Figure 40. Notice that we have opted for a centralized Research and Development function. We decided on this alternative because we consider it essential to allow for a strong Research and Development group with a significant critical mass. Decentralizing that function would have resulted in the proliferation of small Research and Development efforts under each business, preventing cross-fertilization and allowing for separate and uncoordinated programs to take place. Although a centralized Research and Development function creates some problems for the coordination of Research and Development with a specific Manufacturing and Marketing functions of each business, we believe this is a bearable price to pay to implement coordinated Research and Development programs among the businesses.

6.7 Conclusion

To summarize, this Case Study, which merely represents a sketchy description of the actual effort involved in designing an organization, can be useful to illustrate in a real life context the efforts required to implement the design process recommended in Section 5. It also serves to illustrate the

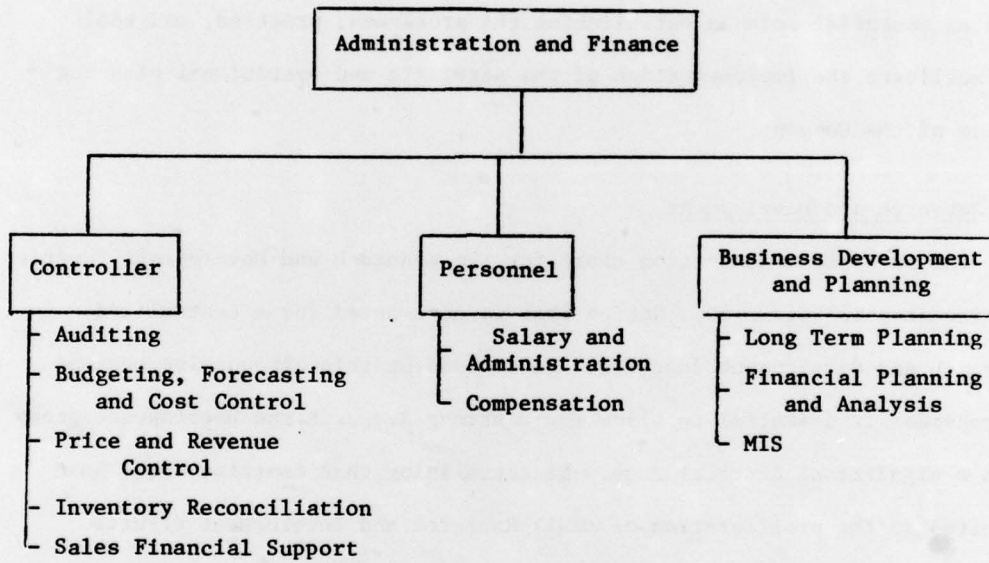


Figure 39: Proposed Organization for Administration and Finance

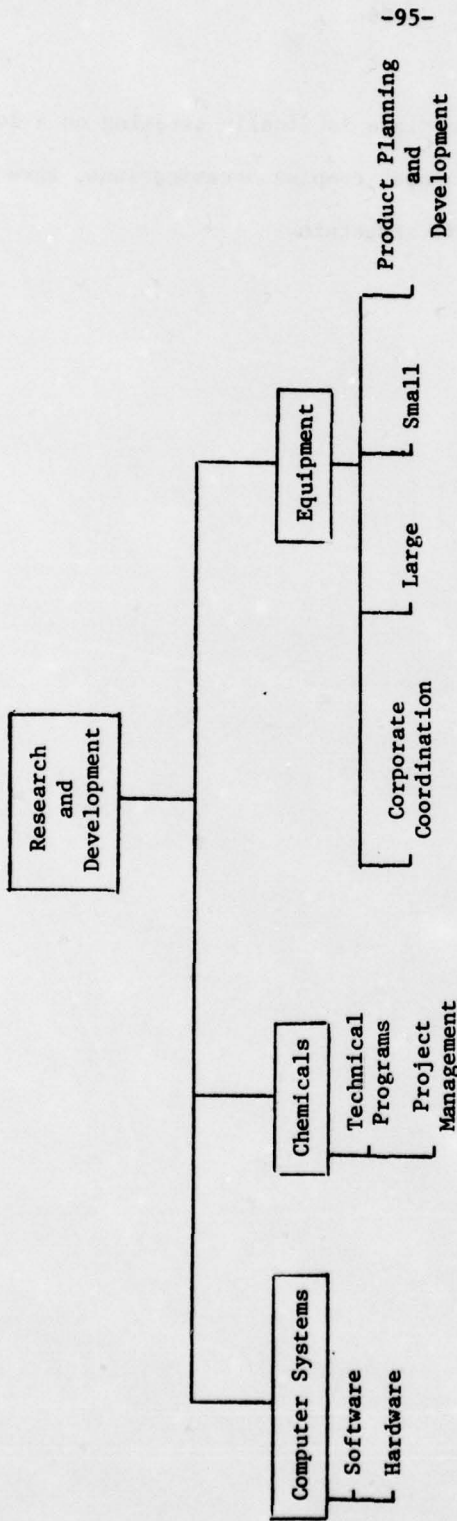


Figure 40: Proposed Organization for Research and Development

multitude of trade-offs that take place in finally agreeing on a desirable organization form. That form, in most complex organizations, invariably leads to the selection of a hybrid structure.

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