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Renewal of the Conventionally Structured Medium-sized Manufacturing Organization

MSEM Thesis

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ABSTRACT

A medium-sized manufacturing organization is defined as having 200 - 2,000 employees and having annual sales revenue of $20 - 400 million dollars.

Conventional structure is defined as that of the hierarchy in which activities are functionally divided and the typical mind-set is one of segmentation and isolation. The mode of operation within this structure tends to be mechanistic, command and control.

The hierarchal, dictatorial structure served organizations well in past decades. The operating environment of todays organization, however, is radically different than that in which the hierarchal structure was established. The forces acting upon the organization today prevent it from adequately meeting the needs of its stakeholders with such an impeding, barrier ridden, structure. Societal, globalized business and intra-organizational interrelationships demand that the conventional manufacturing organization undergo radical changes -- or perish.

Applying localized, band-aid type fixes to such a dysfunctional system is not the answer to achieving long term viability. Indiscriminate use of programs such as JIT, TQM or QFD will have minimal effect without the proper organizational foundation.

The key element needed for success is strong, cohesive leadership. Leadership has always been important but it is crucial in the ever turbulent environment of the future. Organizational leaders must understand the fundamental concepts of the organization: the four needs which underlie its reason for existence; the core functions of the manufacturing organization, the network of activities which support these functions and the theories of human nature which influence how individuals interact to achieve organizational objectives.

The number one priority of leaders is to effectively align the people resources of the organization with the efficient accomplishment of its core functions. The energy of these resources must also be unleashed and directed toward continuous, change producing organizational renewal. To have this happen the organizational leaders must formulate and communicate the organizational vision and must provide the direction, culture and structure most conducive to achievement of the vision.

The structure of the successful, continuously renewing, medium-sized manufacturing organization of the future must be oriented around integrated, value adding activity centers rather than discrete, isolated and self-serving functions. These

activity centers must have access to all information needed to make strategic decisions along with the required support resources.

The culture of the manufacturing organization of the future must be one of product and process innovation; both teams and individuals must be challenged and empowered to achieve greater competitiveness in both of these areas. People must be made to feel a sense of ownership in the organization; they must experience satisfaction from their intrepreneurial activities and must be recognized, rewarded and compensated accordingly.

There are numerous barriers within a conventional organization which inhibit or prevent the organization from achieving a structural and cultural oriented renewal. For those organizations which are privately owned, the owners themselves could present the greatest barrier. If change is deemed to be unnecessary or unwanted by the owners, little can be accomplished -- regardless of the effort. The higher the position in the organization, the greater the need for change related support and the greater the possible barrier to such change. The two most critical elements to enhancing or impeding change are the owners and CEO. A strong CEO, with owner or shareholder backing, can achieve the desired transformation in spite of the difficulty encountered at lower levels.

A restructuring renewal is a financially sound strategy. Companies which have restructured for better organizational performance have achieved an attractive financial return on investment. To maintain control of the restructuring process from a time, resource expenditure and cash flow standpoint; it is imperative that the product be led by competent people using project management tools.

Renewal of the medium-sized manufacturing organization via the structural and cultural changes as proposed will be traumatic and difficult but are mandatory if the organization is to successfully meet the future needs of its stakeholders.

I. INTRODUCTION

Customer Demands and Organizational Change

The late 1980's and early 1990's has been a period of unprecedented change for goods producing organizations in the United States. The majority of change taking place is in response to competitive pressure; pressure initiated primarily by Japanese companies with their higher quality products. Quality has been given many definitions, one of which is: conformance to the expectations of the customer. A quality product could then be a product that performs its intended function better, has more desirable features, lasts longer without repair, costs less, is more readily available or any and all combinations thereof. The Japanese have put together a formula for achieving greater levels of customer satisfaction by providing a higher quality product; the market has responded and continuously demands more of the same.

Previous Literature and Piecemeal Change Programs

There has been much written about the Japanese revolution and its impact on global competition. There has also been much written about the problems with American companies;particularly our manufacturing organizations. Notable authors such as Drucker, Peters, Kanter, Bennis and Demming have written that organizations must significantly change the way they operate in order to counter the threat of Japanese competition. These and other experts have espoused such competitive organizational weapons as stronger, more visionary leadership, more effective management styles, the empowerment of employees, customer orientation, flattening of the organizational structure, changing of the organizational culture, concentration on the basics, the ability to adapt and respond, team orientation, world class operation, intrepreneurship, renewal and rebirth.

To supplement these concepts there has been a seemingly unending array of "tools" organizations can use to assist in changing and in competing more effectively: total quality management (TQM), just in time manufacturing (JIT), manufacturing requirements planning (MRP), quality function deployment (QFD) and design for manufacturing assembly (DFMA), just to mention a few.

What has been lacking in the literature is a holistic view of the average manufacturing organization; an explanation of where the average organization is

today and how it got here; the barriers, impediments and inefficiencies of traditional organizational structures and a comprehensive and integrated approach to the type of change required for these organizations to successfully compete in the future. Many organizations have felt compelled to do something to improve their competitive situation. The easiest and seemingly fastest approach is to grab some of the quick fix tools available and get to work. This can result in a lot of change oriented activity but a questionable amount of positive results. Without understanding the basics it could be possible for an organization to have so many of these "miracle tools" in use at one time that the net result would be negative. Change requires effort beyond that of the day-to-day activities. Without proper planning and implementation these change producing activities could drain the organization and make it even more vulnerable. In order to have the activity be effective, focus must be on the objective, not on the activity itself.

The Dilemma of the Medium-sized Manufacturing Organization

By their very nature, start-up entrepreneurial ventures have many of the traits larger businesses are trying to regain: flexibility, customer contact, responsiveness and efficiency. Large organizations with their inertia and diversification have the capability to endure short periods of adversity until their vast resources can be mobilized to counter an organizational threat. The medium-sized organization is caught somewhere in the middle; its structure typically being ineffective for fast response and efficient operation, not having the inertia to endure any long term threat and not having the resources, human and capital, to apply to a large scale, long duration change program.

An Integrated Approach to Change

The purpose of this paper is to focus on medium-sized manufacturing organizations and to present a comprehensive approach to change -- an integration of organizational theory with the noble concepts and useful tools which have been presented in other pieces of isolated literature. The medium-sized manufacturing corporation was chosen because it has not been given the attention of either the entrepreneurial start-ups or the large companies the likes of 3M, IBM or Motorola. Also, because of unique characteristics to be further detailed, it appears that this size and type organization might have the greatest difficulty in achieving the necessary

change and also be able to derive the most benefit from the change; in the form of productivity, profitability and competitiveness.

Current literature indicates that many organizations have tried to emulate the Japanese by blindly applying their techniques without modification. Others have embarked on a piecemeal approach to organizational change by applying remedial tools without an understanding of how the organizational pieces fit together. This paper presents a situational analysis of the typical medium-sized manufacturing organization; how it evolved into its present form and what are its particular problems. This presentation is not meant to imply that all organizations of this type are at the same stage of evolution, have exactly the same problems and are presently operating in the same manner. Some, obviously have never gotten to the state as described and others, while they many once have been here have achieved or are in the process of successful transformation. Again, this paper is intended to convey the typical medium-sized manufacturing organization, not the exceptions.

A Solid Foundation: Understanding of the Basic Theory

Historical evolution is used to demonstrate how these organizations have become burdened with cultures, structures and modes of operation not conducive to effectively competing in the future. Organizational theory and various theories of human nature are used as the unifying principles upon which the basic concepts of organizational activity are formed; activity which must be re-directed towards the purpose and core function of the organization. It is these basic concepts which must be grasped and understood by the architects of the organization before resources can be effectively configured and tools used to achieve the desired objectives. The importance of leadership is stressed and the function of leadership is detailed -- leadership which forms the support foundation for the organization. Leadership which must understand the concepts, establish the culture, configure the structure and provide the required vision and direction of the change producing activity.

Unlike other pieces of literature which have dealt with various aspects of the organization, either problems or solutions, this paper presents an in-depth situational analysis and a comprehensive and integrated proposal for renewal -- organizational wide change to make the medium-sized manufacturing company more able to survive and thrive in this decade and beyond.

I. THE CONVENTIONALLY STRUCTURED MANUFACTURING ORGANIZATION: EVOLUTION, PRESENT CONDITION AND AREAS REQUIRING CHANGE

A. General Characteristics of the Conventional Organization

Organizations which will be categorized as traditional, medium-sized manufacturing operations can be extremely diverse in the products they make and also in the markets they serve. The manufacturing processes employed can range from light, through medium to heavy industrial in nature. The product might be strictly mechanical in nature, electrical/electromechanical or virtually all electronic. The market served could be consumer, industrial, military or any combination thereof. This first section will focus on the characteristics of the type of organization under discussion and how such an organization has evolved into its present form.

There is an entire spectrum of organizations between the several person start-ups to the tens of thousand employee conglomerates. Somewhere within this spectrum is the medium-sized manufacturing organization. The start-up ventures have no reserve resources, no inertia, must remain completely focused on objectives and also on day-to-day cash flow. Although these small start-up companies are the most responsive and efficient of organizations, tolerance of serious tactical errors is minimal. Multi-national, multi-divisional organizations on the other hand are diverse and have a multitude of knowledge and resident experts upon which to rely. By virtue of size and diversity they also have enough inertia to maintain momentum through difficult economic times or to minimize the impact of a certain amount of poor decisions. Again, the medium-sized organization is somewhere between these extremes. Not being at either extreme, the medium-sized organization has the latitude to operate either toward one end of this spectrum or the other or can mix and match strategies to suit. It is important, then, for the organization to "know itself" and have a clear sense of identity of what it is and what it wants to be. Acting big with small resources could lead to financial collapse; acting overly small could mean a squandering of resources and missing opportunities for solid growth and a more solid future.

B. Organizational Structure and Culture

As described here, a medium-sized manufacturing company is one which employees approximately 200 - 2000 people and generates perhaps 10 million to 500 million in annual sales. To further characterize or describe an organization is to relate to the structure of the organization and also its culture or "mindset". A conventional organizational structure is defined by this author as the hierarchal, command and control structure which was first implemented in the 1920's. The origin of this structure and a detailed analysis of it will be presented in the following sections. The specific product of the organization and its exact size is relatively unimportant. It is the evolutionary path taken to reach its present state along with its structure and culture which gives it unique characteristics.

The structure of an organization is a map of how organizational activities and processes are arranged and linked to one another; commonly represented in an organization chart.[1] Structure is further defined as being the formal allocation of work roles and the administrative mechanisms to control and integrate work activities, including those which cross formal organizational boundaries.[2]

The culture of an organization is defined as a typically unwritten set of shared values and norms which tend to influence the behavior, attitude and activities of individuals.[3] Culture is not the same as structure although an organization's culture definitely influences its structure and perhaps to a lesser degree, structure influences culture. In Section F of this section there will be some examples given and also some references cited which indicate this relationship between culture and structure. Specifically, the companies IBM, Hewlett-Packard and Johnsonville Foods show how the beliefs and values of the founder and/or CEO influences the culture of the organization and how this culture is translated or manifested in individual interrelationships. The structure of an organization is the configuration of interrelationships between individuals and functions. Culture is abstract; structure is somewhat more physical and discernible. When considering the organization as a whole, culture can be given characteristics such as self serving, customer oriented, concerned for the individual or innovative. Culture can be very subtle and very complex and consist of facets which range from praiseworthy to marginally ethical. Culture is an accumulation of the presence and influence of all those who have been a

part of the organization throughout its history. Typically, the person who has had or still has the single most influence on the culture of an organization is the founder/owner.

C. Three Stages of Organizational Growth

As referred to here, conventional, medium-sized manufacturing organizations are those founded some thirty to seventy years ago by an entrepreneurial individual and which have evolved into their present form but which still retain the structural characteristics prevalent during the founding and early growth years. The founding person might very well have started his venture with a good idea, a willingness to work hard and not much of anything else. The founder might not even have had a high school education let alone knowledge of finance, marketing, scientific management principles or new business venture techniques. The operating environment of that era however was relatively simple and friendly and quite stable compared to that in which businesses of the 90's must function. The structure and mode of operation of a start up business of fifty years ago though, might not have been all that different from a start up of today. Any start up venture, consisting of only a few employees, each forced by necessity to perform a variety of functions, operates successfully in a very informal and flexible manner. This start-up period is the first phase of an organizations existence and is characterized by high efficiency, good communication, low individual specialization and responsiveness. There comes a time, however, once the operation reaches a "critical mass" that some type of formal structure needs to be put into place to organize and control the unit such that it functions in an organized rather than haphazard fashion.

In this second, or growth stage of an organizations' existence, labor dividing methods are implemented. Formal procedures replace close personal relationships and the entire operation has a tendency to become more regimented and mechanistic. (Table 1.) The size and complexity of the organization has typically been the determinants as to when formal structures get put in place and also what type. As detailed later, there was typically one basic type of structure used in this era. While it provided the benefit of organization and control, it also tended to restrict and inhibit.

Continued growth takes an organization into its third evolutionary stage - maturity. This is typically accompanied by complex systems for such things as planning, budgeting and customer relations. To handle the burden of administrative and

reporting duties for these systems, staff positions are created. Maturity is also typically accompanied by reduced risk taking as management focuses on stability and improvements to the control systems. The organization progresses from one of flexible innovation to one of stable stagnation. [4]

D. Evolution into its Present Form

Management as a discipline, as a science, as a distinct function began to be recognized as such and to gain prominence in the 1940's. This is approximately the same time frame as when many of todays medium-sized manufacturing organizations were founded. The point being that the executives of that day were not schooled in managerial techniques because the techniques were just coming into existence. In spite of this lack of managerial expertise, these founders built and grew businesses which were successful to varying degrees. These businesses evolved as most things evolve - as needed to adapt to and survive in the changing surroundings and environment. [5]

In an organization which expands in a relatively unplanned, uncoordinated and uncontrolled manner, management tends to evolve in a similar fashion. In a situation of reactive adaptation, both executive and middle managers tend to achieve their positions because of length of service due to organizational need, not because of managerial skills or competence or of leadership characteristics. Organizational structures tend to evolve in a similar manner; put into place and band-aided in a piecemeal approach by management unfamiliar with the formal concept of structure and perhaps using that which is copied from other organizations. The same type of situation is true for key systems within the organization; examples of which are the production scheduling and part procurement systems, the engineering documentation system, the information service system, the cost accounting system, and the compensation system. Haphazard though the evolutionary path might be, the organization continues to function and the business turns a profit. It does not however, function well and it is not nearly as profitable as it could be. It is not very efficient and it is not very effective. It works but it does not work well. This type of inefficient operation tends to be more common in privately held companies where there are no outside investors to demand financial and operational accountability. A good deal of medium-sized manufacturing organizations fall into this category.

This method of operating, though not optimum, was adequate for the manufacturing organizations under discussion when competition was all domestic and all competing in a similar manner; when customer satisfaction awareness was low and when employees were more content to be told what to do rather than have input to how their job is performed. It is not as though no improvements are being made in conventional manufacturing organizations; they are but they tend to be incremental improvements to an operation that is for the most part dysfunctional. The extent to which traditional organizations are dysfunctional in todays environment will be detailed in Section II.

Most of todays senior executives developed in an era in which top down hierarchy was the primary means for organizing and managing. Such people must now learn from innovative approaches coming from younger unit managers closer to the action.[6] Faced with changing markets and increased competition many companies have come to understand that the key to competitive success is to transform the way they function. Such companies are reducing reliance on managerial authority, formal rules and procedures and narrow divisions of work. In effect they are moving from the hierarchal and bureaucratic model of organizations to the task driven organization where what has to be done governs who works with whom and who leads. Robert Haas, CEO of Levi Strauss and Company, states that the functionally oriented behavioral patterns prevalent in the old hierarchal organizations are completely out of place in the flatter, more responsive and empowered organizations of the 1990's. [7]

E. The Organizational Life Cycle

Just like products, organizations have limited useful life cycles. Products are developed, introduced, grow in acceptance and sales, mature and plateau and then decline. When the product is mature, enhancements and improvements can prolong its life but there reaches a time when it can no longer compete. It is old, its technology is obsolete and it can no longer satisfy the market for which it was intended. These old technology products can still be sold in reduced volumes for niche markets and often they are the cash cows; revenues from which are used to finance among other things, the development of replacement products. These old technology products might even sustain a company for a period of time but these are not the products upon which manufacturing organizations bet their future. The 3M Company, not considered a medium-sized operation even though its separate divisions could be, is eighty nine

years old and continues to function in world class fashion. Each 3M division has an iron clad requirement that at least twenty five percent of its sales must be derived from products which didn't exist five years ago.[8]

The 3M Company is somewhat of a unique case; its structure and culture has always been one which many other manufacturing companies are now trying to emulate. Limited bureaucracy, venture teams, incessant innovation, communication, individual empowerment have always been a way of life at 3M and the company has continued to grow, prosper and remain competitive. Relatively few manufacturing organizations have retained the 3M like culture and structure throughout their evolution. The majority of todays manufacturing organizations may have started out in 3M-like fashion but have staffed, controlled and policed themselves into a state of bureaucratic, mechanistic inefficiency.

Just as old products typically cannot satisfy todays and tomorrows markets unless continuously renewed and rejuvenated; a conventionally structured manufacturing organization will also have difficulty satisfying its needs and remaining competitive. It is true that organizational structure alone does not dictate success or failure of an organization. Of much greater importance is executive competence and leadership. The effect of leadership on the structure culture and viability of the organization will be discussed in Section III -- why it is perhaps more important than ever and why it appears to be in such short supply.

F. Characteristics of Owners

Owners who were also the founders of the typical medium-sized manufacturing organization, due to age and lack of direct involvement in the day-to-day operation of the business have become insulated and isolated from the environment. They tend not to be aware of the multitude of forces acting upon their organization from the global environment which now exists. Not having been exposed to any formal organizational concepts they are not aware of nor probably concerned with the modern concepts being tried in more progressive manufacturing organizations of similar size. As an example; the welding equipment industry in the United States was established and is still dominated by three major manufacturers. These companies, all founded in a similar manner and sharing a common conservatism, have evolved by competing with and exchanging ideas with one another to such extent that the entire industry now

suffers from organizational inbreeding. Nowhere in this industry can there be found an innovating organization the likes of Apple Computer, Milliken Steel, Johnsonville Foods or Quad Graphics. Having lived in an era when workers were considered more as capital equipment than an intellectual resource, the owners and executives of the conventional manufacturing organizations are also not aware of the dramatic changes which have taken place in employee attitudes, expectations, priorities and demands.

Several companies are well documented as being exceptions to this rule. They do not fit into the category of medium-sized but they are manufacturing organizations and they were founded in the time frame of those companies under discussion. Most readers can relate to these companies because of their familiar product line.

Hewlett-Packard has been successful throughout its fifty-three year history by producing innovative and high value technical tools and instruments. From the beginning the founders, Bill Hewlett and Dave Packard promoted a people oriented organization low on formal structure and high on results oriented achievement. In a recent update of the corporate objectives, the following statements can be found; "First, there should be highly capable, innovative people throughout the organization; second the organization should have objectives and leadership which generate enthusiasm at all levels" . The statement concludes with: "Hewlett-Packard should not have a tight, military-type organization but rather....give people the freedom to work toward overall objectives in ways they determine best for their own areas of responsibility." Even though Hewlett-Packard was faced with the situation of growth and the associated problems of coordination and control, visionary leadership on the part of the founders prevented the company from establishing a restrictive, hierarchical structure. Also, even though not presently active in the day-to-day operation of the business, the presence of the founders is maintained in the guiding principles and philosophy. [9]

Another large manufacturing organization which is a role model for other organizations is IBM, the seventy-five year old computer maker. The fundamental principles of its founder, Thomas Watson, Sr. have been maintained throughout the years and are still guiding the actions and decisions of today's IBM executives. The IBM Rochester facility was a 1990 Malcolm Baldrige National Quality Award winner. This 6,000 employee facility achieved the quality improvements necessary to win the award by gaining total work force participation in the effort. This effort and

conscientiousness was brought about by concentrating on the basic, underlying principles of the founder. The most important of Tom Watson Sr.'s. beliefs was "respect for the individual"; the fact that workers are the most important asset and that they are the primary source of productivity gains. [10]

In both Hewlett-Packard and IBM, it is the strong beliefs of the founders which continue to influence the culture of the organization. This culture of people orientation and empowerment has kept these organizations responsive, self-renewing, innovative and highly competitive and profitable.

While there undoubtably are some medium-sized manufacturing organizations functioning in a fashion similar to the well publicized giants, research and the authors personal experience indicate they are in the minority. In the typical, medium-sized organization which has evolved in a manner described earlier, it is not uncommon for the owner/founder and even executive staff to be quite insulated and isolated from the true pulse of the organization. The day-to-day decisions are made primarily by middle managers and the actual activities carried out by the workers. Too often, information reaching the executive level goes through several layers of interpreters and filters. (Figure 1). Individuals in various levels between the bottom and top of the organization have the opportunity to manipulate facts in attempts to put themselves in the most favorable position. Information moving upward tends to get skewed and distorted such that decisions made at the upper levels might not be in harmony and synchronized with reality. In contrast to model organizations the likes of Hewlett-Packard and IBM which operate in a cohesive, integrated manner under the guiding principles of the founder, a more typical mode of organizational operation is one of disjointed segmentation. This could be the result of the founders being isolated from and subsequent loss of control of the organization; basic lack of leadership and/or organizational skills needed for effective operation or not having established and continuously reinforced a strong culture throughout the organization.

G. Conventional Organizational Structure

As organizations grew in size and complexity during the twentieth century, structures evolved to assist in maintaining control and increasing efficiencies. There have been three major structural changes within organizations in the last 100 years. The first occurred around the turn-of-the-century when a distinction between

ownership and management took place. (Table 2.) This happened when some large companies of that time turned the responsibility of running the business over to professionals and relieved owners and family members of those tasks. This trend established the managerial function as work in its own right and gave it legitimacy. [11]

The second major evolutionary change in organizational structure occurred around 1920. The structure which still exists in the majority of organizations today was established by Pierre Du Pont in his family business and also by Alfred P. Sloan in General Motors. The overall pyramidal shape of this structure is actually made up of individual pyramids consisting of the separate business functions such as marketing, finance, engineering, manufacturing, etc. (Figure 1.) This structure is what is referred to as command and control or hierarchal and is shown in graphical form as the traditional organizational pyramid. This structure emphasizes central service staffs and an intricate network of budgets and controls; it segments and isolates individuals and functions and fosters the bureaucratic mentality. Segmentation helps to keep an organization steady and on course, changing as little as possible -- good in a stable and predictable environment but potentially life threatening in the environment of today and tomorrow. Organizations with segmented cultures are likely to have segmented structures and vise-versa.

Burns and Stalker have written that a key characteristic of a mechanistic structure is that authority, information requirements, technical activities and competence of any given position are closely defined. No occupant of any position may operate outside the limits of that position. On the basis of the research done by these two authors, the mechanistic system is best suited for routine problems and stable environments whereas organic systems are more appropriate for situations involving frequent change and non-routine problems. (Table 1.) According to Gerloff, bureaucratic structures are the epitome of what is characterized in the mechanistic style of operation. [12]

Structure is key to the effectiveness of any organization. Structure defines the configuration of interacting activities, concentration and location of authority, line control of work flow and the size of the support component. Mintzberg, states that many organizational problems can be attributed to an improperly designed structure.[13]

He goes on to characterize five basic components to any organization.

- **strategic apex:** top decision making authority
- **middle line:** intermediate managers
- **operating core:** people who do the basic work of the organization
- **techno-structure:** those who plan and implement internal systems
- **support staff:** those providing indirect or support services to the rest of the organization

Mintzberg goes on to arrange these components into five distinctively different structures with associated characteristics and attributes (Figure 2).

- **Simple structure:** minimum staff and middle line; direct supervision and control from apex to operating core. Simple structures are used for small and/or entrepreneurial companies.
- **Machine bureaucracy:** large organizations whose coordination depends on work standardization; well suited to mass production situations involving stable environments and simple technical systems. Organizations with such structures tend to be large, old and inflexible.
- **Professional bureaucracy:** more typical of universities, hospitals and consulting firms than of manufacturing organizations
- **Divisionalized structure:** similar to many small companies operating under one corporate umbrella; structure used primarily by Fortune 500 type companies. The environment for such a structure involves stable but diversified markets and technical systems which are simple but regulating.
- **Adhocracy:** provides loosely coupled project teams composed of experts from various disciplines and specialties; adhocracies have high levels of specialization but low on formalization and standardization. Power tends to be based on expertise rather than authority. Adhocracies are flexible and capable of complex innovation.

Mintzberg makes the relationship between size and bureaucracy: "size drives the organization to bureaucratize but also encourages the organization to grow larger. Aging compounds the relationship and the net result is a vicious circle of degrading effectiveness. " Of the five basic types of structure, three: simple, machine bureaucracy and adhocracy could be used in various combinations in a medium-sized manufacturing organization. It is important, then, that the leaders, the architects of the

organization, understand the ramifications of each and which might best suit the needs of the organization.

H. Segmental, Adversarial Mentality in a Hierarchal Structure

In the conventional organization there is typically more segmental mentality than there is integrative mentality; too much protectionism; too much hoarding of information and subtly subversive activities. This is so, to a large extent because of the quality of managers; those appointed to their positions out of organizational need rather than qualifications for the position. Incompetence fosters insecurity and promotes the forming of protective mechanisms to gain at least perceived security. People do not want to feel or be thought of as being incompetent and will build walls to prevent themselves from being seen as such. They will adopt an authoritarian attitude to appear to be in charge and in control. They will attempt to discredit others in order to make themselves look better by comparison. They will use their energy non-productively and will severely limit the beneficial use of the energies of others. Strong, competent, qualified and educated managers, in general will cause just the opposite to happen. In short, because of unqualified managers and/or nonexistent leaders the typical organization is dissipating its energy in the form of friction-generating heat rather than utilizing its energy to move towards organizational goals.

As mentioned earlier in Section B, organizational culture is an unwritten set of shared values which tend to influence the behavior, attitude and activities of individuals and is an accumulation of all those who have had or still do have the most influence on the organization or segments thereof. It is the opinion of the author that bureaucratic individuals establish and promote bureaucratic structures and bureaucratic structures nurture bureaucratic individuals. Which came first is irrelevant, the fact is, it is a self sustaining situation of bureaucratic mentality.

In a segmented environment, individual departments function as though they are the nucleus of the organization; **the** most important function and the sole reason the organization exists. There is relatively little awareness of the concept of internal customers or value added activity; the focus is on the function and not the organization. When such a situation exists, information tends to stay within a function and not be shared; activity tends to be directed toward enhancing the function even at the expense of organizational goals; internal competition is fostered and the overall

organization becomes inefficient, ineffective, overweight and sluggish.

Lawrence and Loisch describe differentiation and integration within an organization: **Differentiation** is the differences in cognitive and emotional orientations among mangers in different functional departments and differences in formal structure among these departments. **Integration** is the quality of the state of collaboration that exists among departments that is required to achieve unity of effort by the environment. [14] Gerloff states that a more complex environment means more complex design decisions and that the organizational structure itself must be more complex if it is to be effective in complex environments. He goes on to state that simple mechanistic structures will not adequately satisfy the integrative, requirement for diverse, changing environments. [15]

According to Perro, the pattern of interaction required to implement a particular set of actions upon an object in order to make a change in the object is called organizational structure.[16] Or, saying it another way, organizational structure is created by the pattern of interactions necessary to bring about some change in an object. Two aspects of an organizations activities or actions have a bearing on its structure; the number of exceptions encountered in carrying out the actions and the type of alternate action required when the exception does occur. The type of organizational structure best suited for a particular type of organization depends upon the nature of the activities. Routine activities call for mechanistic structure and non routine, unpredictable activities are best suited to flexible, organic structures.

At the same time segmentation is keeping an organization steady it is also inhibiting the entrepreneurial spirit, making it a slave to the past and a victim rather than a master of change. When organizational focus is on the individual segments and not on the organization as a whole, it becomes difficult to maintain a view of the organization and its fit with the environment. Individuals within the segmented functions are busy trying to justify their fit, attempting to rationalize their existence and reacting to the continuous jostling for position and recognition. This condition causes excessive internal focus and a loss of focus on the true purpose and objectives of the organization. The overall mentality can be one of continuous reaction to stimuli rather than one of cohesive and integrated proactive cooperation towards making the organization stronger, more effective and more profitable. Segmentation compartmentalizes actions, events and problems and keeps each piece isolated from

the rest. The individuals within these functional pyramids tend to focus on concepts and activities within the boundaries of their pyramid or their segment. Orientation is toward a sense of belonging to the function versus belonging to the organization as a whole. Consequently allegiance is stronger to the function than perhaps the organization. Effort is put into strengthening and fortifying the function rather than the broader interests of the organization. This leads to the not-invented-here or the bureaucratic trap in which powerlessness and the need to defend established territory lead people to resist the good ideas of others. The opposite end of the spectrum can also occur whereby the need to be the source, the originator, the hero causes people to push their own ideas single mindedly. [17] Advancement in a segmented organization is achieved by moving up within these isolated pyramids. Doing well at ones functional area of expertise as perceived by the respective manager becomes more important than doing what might be in the best interests of the organization. With this type of structure it is easy to see how political power struggles exist when local interest groups are self oriented and trying to preserve and strengthen these isolated kingdoms.

I. Positive Attributes and Limitations of the Hierarchy

When properly structured, a hierarchy is the most efficient natural structure ever devised for large organizations. It allows accountability for value added activities at every stage as work moves through the organization, and it also allows for large complexities to be broken up into manageable pieces. [18] Hierarchy works however, only when a bond of confidence exists among people at different levels of status and power. Typically, the degree of distrust among people in an organization is too high to have a hierarchy work as well as it theoretically might. [19] Hierarchies are maintenance oriented structures well suited for routine operations; they define job titles, pay grades, sets of relatively fixed reporting relationships and related formal tasks. The main function of the hierarchy is the continuing routinization of useful procedures.

Opportunity in a hierarchy is relatively limited to formal promotion paths. The ability to make decisions at a local level is also limited due to concentrations of power. Within a structure of isolated pyramidal hierarchies, communication and cooperation is relatively difficult to achieve. Depending upon the organization and the individuals in charge of the various segments, vertical communication within ones own segment or

horizontal communication with a peer in another segment could be either relatively easy or very difficult. Overall however, segmentation significantly impairs and reduces communication which could and should otherwise occur. In a study done by Professor Thomas Allen at MIT, the amount of communication between individuals radically decreases when a separation distance of approximately thirty feet or greater is present.[20] Without both communication and cooperation, establishing organization wide objectives and efficiently and effectively achieving them is difficult to impossible.

In a stable environment, once the objective is determined and strategy and plans formulated, achieving the objective is a rather routine matter. Assignments can be made, progress monitored and at approximately the predetermined time the destination is arrived at. A hierarchal organization with regimentation and prescribed policies can deal very well with this type of situation. The majority of modern business strategists/theorists indicate that this type of simplistic environment is becoming increasingly rare. This is definitely so for the majority of manufacturing organizations under discussion. As will be discussed later; fiercer competition and more demanding customers along with a myriad of internal and external forces make the environment of the medium-sized manufacturing organization increasingly turbulent and unpredictable. In such an environment, a sluggish, mechanistic organization cannot be competitively responsive. Decisions must be made faster and be modified more often and more people must be empowered to implement the organizational strategy at the lowest possible level.

A hierarchy is a natural form of organization in the animal kingdom. It is a natural tendency to create a hierarchy of power as a means to avoid the sense of chaos of a disorganized mass. In studies of "natural groups", previously unstructured, leaders and followers aligned themselves into remarkably predictable relationships with few at the top and many at the base of the pyramid. Hierarchies are natural, they inherently are neither bad nor good. To the extent that they can avoid confusion and chaos they are good; to the extent that they can cause paralysis and unresponsiveness they are bad.

An effective organizational structure gives power to those most capable of directing the group to achieve its goals. Hierarchy is the best available means for organizing power so that it can be used to further the interests of people. Hierarchies work when organizations prosper and people have confidence that the few at the top have the

best interests of the majority in mind. For organizations to work best a commitment from individuals at all levels is required, particularly those at the top who have the most decision making power.

A political orientation of organizational leaders, as opposed to an objective orientation toward overall organizational effectiveness and well being, diminishes commitment, isolates and alienates people at different levels and in different areas and undermines the integrity of authority. There are specific skills pertaining to management, those people having the power of authority, different from any other discipline; these being inter-organizational communication, decision making under uncertain conditions and strategic planning.[21] For an organization to prosper, these skills must be directed toward the objectives for which the organization exists. When those in managerial ranks do not posses these skills or improperly direct them due to political motivations, organizational competitiveness and overall health and well being suffers.[22]

J. Leadership; Needs and Traits in the Medium-sized Manufacturing Organization

In the traditional organization the executive staff immediately below the owner/CEO tends to be older, lacking skills and knowledge attained through formal education and more adept at operating in a highly political and bureaucratic environment. Many of these executives have achieved their position due to organizational need and length of service as described earlier in Section B. Others undoubtedly achieved their positions because of personal relationships with those making the selection. To these executives the hierarchical, segmented structure most typical in this type of organization is all they know and they believe it is the best and perhaps only way to operate. It probably does provide them with the greatest security and the best camouflage for their shortcomings and allows them to exert the control necessary to make them feel as important as their level in the organization would infer.

It is this group of executives that should be providing the leadership for the rest of the organization. It is their job to formulate the corporate mission statement, provide the vision and formulate the long range strategy necessary to guide the organization in its day-to-day activities. This is the group which should be providing leadership role models for middle managers and establishing an environment to best insure the future

viability of the organization.

Strong, effective leadership has always been crucial to the success of an organization. The more turbulent the environment the more the organization requires strong, visionary, cohesive leaders to provide the required direction and support. In more stable times, medium-sized manufacturing organizations stood a better chance of survival with mediocre management and leadership. Today this is much less the case: the medium-sized manufacturing organization, not unlike any organization, requires a higher caliber of management and more effective leadership.

As todays traditional organizations grew from the embryonic stage and became increasingly more complex, they required people to be put into executive and middle managerial positions to control various areas of the operation. When the need for a manager was perceived, the person selected might have been a friend and/or relative of the person making the selection or perhaps its was someone who had done a good job as a worker within the department. Consideration was typically not given to the person's managerial, organizational, people or leadership skills, only to who was most available in the time of need. It is the people selected in this manner who now are in the decision making positions in many of the manufacturing organizations under discussion -- people who should be providing the aforementioned leadership but due to a faulty selection process are unable to do so.

Unqualified managers have had difficulty coping with the continued organizational evolution. Not having the required skills to begin with, as the organization continued to grow and become more complex it also became more ineffective and out of control due to the lack of managerial leadership. Many organizations have consequently lost the positive attributes of the start-up business such as responsiveness, flexibility and fast and easy information transfer and focus on the purpose and objectives of the organization.

K. Management Characteristics

Just as the success or failure of an organization can be attributed to its upper executive leadership, so too, can the success or failure of lower level projects or activities be attributed to the respective managers. Individual accomplishment and inter and intra functional cooperation is a direct result of the department manager who either supports or thwarts such activities. Middle management in a conventionally

structured organization is of crucial importance; it is the vital link between the actual doers and the long term planners. People at this level are close enough to the upper level strategists to know what needs to be done on a company wide scope and still retain enough proficiency in their field to guide the activities of individuals within the department to insure goals are being met.

It is generally felt that the key functions of management are those of planning, organizing, motivating and controlling. Planning involves the setting of goals and objectives for the organization and the development of "maps" on how to get there from here. Once the planning has been done, the organization resources: people, capital and equipment must be brought together in some effective manner to achieve the goals and objectives. Thus organizing becomes an act of integration of resources.

There are three areas of skill necessary to carry out the process of management:

1) **Technical skill:** the ability to use knowledge, methods, techniques and equipment necessary for the performance of specific tasks; acquired from experience, education and training
2) **Human skill:** the ability and judgment in working with and through people; including an understanding of motivation concepts and an application of effective leadership characteristics.
3) **Conceptional skill:** the ability to understand the complexities of the total organization and where and how ones own function fits.

Figure 3 represents the need for these skills at various levels of management. While the amount of technical, human and conceptual skill varies at the three levels of management, the common denominator that appears to be crucial at all levels is skill in human interactions or interpersonal skills.

There are four managerial roles which must be fulfilled if an organization is to operate effectively. These four roles are:

1) **Producing:** achieving results equal to or better than the competition
2) **Implementing:** the act of scheduling, coordinating, control and discipline
3) **Innovating:** the use of judgment and discretion to modify goals and systems to a changing environment
4) **Integrating**: the merging of individual strategies into a cohesive whole.

Of the four roles, it is suggested that the role of integrator is of the most importance to an organization.[23]

Hersey and Blanchard state that to have effective human skills, managers need three levels of expertise:

1) **Understanding past behavior:** an understanding of why people behave the way that they do
2) **Ability to predict future behavior**
3) **Ability to influence the behavior of others:** in accomplishing organizational tasks and achieving goals.

In conventional organizations, "cowboy" managers are widespread. Cowboy managers shoot from the hip; draw and fire before clearly seeing the target. They react to a problem by overreaction. Without collecting all the available, relevant facts they pull together resources from their "partners" or just "rustle resources from the weaker "settlers" and storm off to massacre the Indians". They tend to be loners and tough individualists who disdain group effort and methodic problem solving. They tend to be older, modified Theory X type managers who use the "muscle" of their position to mask or make up for their lack of skills. According to Mc Gregor, managers who accept Theory X assumptions attempt to structure, control and closely supervise their employees. [24] More so now than ever, Theory X managers are truly dangerous people who may achieve some apparent benefit to the organization but through lack of empathy and interpersonal skills leave behind the scarred and the wounded. This behavior is ultimately more damaging and detrimental to the organization than the limited amount of results attained. [25] The tragedy is not so much that there are so many of these cowboy managers but that they are allowed to operate in this fashion. This is indicative of the culture of an organization and the competence of the executive staff; a staff that either operates this way also and see nothing wrong with the method and/or a staff that is too weak to put a stop to this type of behavior.

The process of "making someone a manager" is nothing short of a fairy tale miracle. In organizations with no management succession planning it is commonly thought that instantaneously, at the wave of some magic wand, an ordinary person can be made into a manager; with no formal education, no training, no guidance, no support and few if any of the basic skills. On the job experience and managerial characteristics tailored after role models is not adequate for effective management leadership. As previously indicated, success depends on a knowledge of formal methods and techniques and of various motivational concepts. Experience is fine but it must be

complemented with formal education and training and also proper guidance and support. In far too many medium-sized manufacturing organizations managerial training or management succession planning is dismal to non-existent. Companies have invested large amounts of capital into employee involvement programs and worker training programs; they are careful to recruit and train the very best technical talent but are virtually oblivious to the need for similar investment at the managerial level. [26]

In most organizations the importance of technological competence is recognized and large investments are made accordingly. In like manner the importance of product reliability and customer satisfaction is viewed as necessary and corresponding investments are made to achieve those ends. The significance of competent managerial talent in an organization however, still eludes the majority of owners, shareholders, CEO's and executives in the conventional, medium-sized manufacturing company. In any organization, managers should be the catalyst by which the resources of the organization: time, capital, facilities, equipment, information and people are effectively and efficiently combined to achieve the organizational objectives. The best resources are only marginally beneficial without the means to extract their full potential. This, then is what good management is all about: the **integration of resources** and their **effective utilization** toward the **successful accomplishment of organizational objectives.**

Each person, each company, has only a limited amount of energy available. This energy can be used toward productive, value added, goal achieving work or it can be expended on non-productive, non value added political activities. Energy can be used to unite and do battle with competitors for the ultimate benefit of customers and the organization or it can be used to divide and do battle internally against other individuals and other departments. In the latter case both the customer and the organization suffers. Leadership and management will determine how an organization utilizes its resources and expends its energy.

L. New Worker Attitudes and the Internal Organizational Environment

Local work environments in which individuals are expected to perform their tasks are a direct result of the aforementioned factors; organizational culture, leader/ manager characteristics and operating structures. The era of command and control

was one in which relatively few people had a higher education or skill levels. It was also an era in which the Theory X type of management prevailed. Workers, because of their feeling of inadequacy and subserviency were content to allow decisions affecting their future to be made by a relatively few people -- not themselves. Not having access to information, they allowed those who did have the information to make decisions for them. The last several decades has profoundly changed the average worker, particularly the so called white collar worker. This group of individuals is generally well educated, highly informed, goal oriented, and typically wants to have much more control over their own destiny then their predecessors. The restrictive, dictatorial, barrier ridden and innovation stifling environment prevalent in the hierarchal command and control organizations is not compatible with this new breed of employee. (Table 4.)

Both traditional white and blue collar jobs now have this new style of worker; one that is seeking greater enrichment and satisfaction from their efforts. At the same time organizations are seeking to reduce layers of management and intermediate decision makers, workers are seeking greater control of their work environment. Progressive organizations are attempting to empower employees and drive decisions to the lowest level at which they can be made. Employees, striving toward higher levels of recognition and self actualization are accepting the responsibility of managing themselves and their local work environment. [27]

M. Compensation: Practices and Policies

The system of employee compensation in most conventional manufacturing organizations is intimately linked to the hierarchal structure and associated mind set. For the most part, reward is based on rank or level in the structure rather than on contribution or worth to the organization. Except for those organizations which have some type of profit sharing and/or bonus plan, the amount an employee can earn from a high level of contribution and value is not much different from that of low contribution. Achieving more compensation via increased rank favors those who are more adept and/or prone to political maneuvers rather than those motivated toward cooperation and dedication to organizational objectives. In an effective compensation system the pay must match the contribution and the link must be made clear. In order to limit guaranteed salaries and promote contribution, one time awards should be given out

based on exceptional levels of performance. Compensation should promote employee ownership in the organization and also a sense of venture. [28] The traditional, outdated, ineffective and inadequate compensation system promotes mediocrity, risk aversion and complacency, and penalizes those with the potential to benefit the organization the most.

II. THE NEED FOR CHANGE

A. Societal and Business Evolution

Relative to the history of civilization, the history of the goods producing organization has been extremely brief. Just as society continues to evolve so too does that aspect of society embodied within such an organization. There have been two major evolutionary stages so far in the history of the organization; when companies moved from family run to professionally managed around 1900 and when some large companies began using the hierarchical structure for organizing, around 1920. It is absurd to believe that any one form of the organization is the ultimate form or will continue to be adequate as society and the organizations operating environment continue to evolve and to change.

Each major organizational change has been in response to a changing combination of stimuli -- environmental, societal and technological. All facets of these stimuli, from an organizational standpoint, can be classified as either external or internal forces. The forces acting upon todays manufacturing organizations indicate that the present command and control, hierarchal structure designed and developed six to seven decades ago is inadequate. This type structure has well served the needs of the organization in past decades but it has reached the end of its useful life cycle.

B. External Forces on the Organization

External forces can be further classified as either pull or push forces. Pull forces are those exerted by customers and markets in demand for products which satisfy perceived needs. These demands are in the form of more reliable, higher quality products, better product support, greater value and more easily obtainable product. Push forces are those exerted by competitors in an attempt to provide a greater degree of satisfaction to a given customer base. The competition no longer comes from within the market area it is attempting to serve nor even from within the same geographic area; it is in fact global competition. Global competitors are using any and all means available to obtain an advantage: government supported industries; sophisticated, intelligent and innovative marketing strategies; the latest in new product technology; state-of-the-art manufacturing concepts and unprecedented product quality -- all at a competitive price.

Companies everywhere are playing a common game -- that of competing for market share; but may be playing under various sets of "rules". Local government and financial community support along with favorable trade regulations make it easier for companies in some countries to compete. Countries with homogeneous cultures and more integrated and focussed national objectives could have the advantage when competing with those countries of multi-culture and multi-objectives. Developing countries tend to have developing organizations and as such neither the workers nor the organization are at the stage of evolutionary development as those in the more industrialized nations. At the extreme, there are companies in the United States and Germany competing against developing countries in the Pacific Basin. In one instance workers are striving for satisfaction of their self-actualization and personal recognition needs while others are striving toward their basic physiological and safety needs. One group is demanding involvement in their organizational existence and the other group is willing to work at subsistence wages in a very mechanistic, dictatorial, organizational environment.

C. Reaction to External Forces

Different rules for the same game mandate that companies operating in a handicapped mode must do something to offset such handicaps. Such companies must seek to turn governmental, cultural, individual and organizational uniqueness into a competitive advantage. To the alert and intuitive manufacturing organization the new demands customers are clamoring for represent opportunities, not threats. Companies in a position to anticipate these demands and be proactive in satisfying them will be able to outmaneuver the competition. Statistics indicate that the first several suppliers of a demand satisfying product can expect to command the lions share of the market. Michael E. Mc Grath, director of management consulting from Pitigho, Rabin, Todd and Mc Grath of Weston, MA states that potential gains from improving new product time to market can run from 40% to 60%. [29] Boston Consulting Group vice-president Philippe Amouyal puts the potential gains even higher, at a factor of two. Companies not having either the leadership vision to see opportunity or not having the structure allowing fast response to the opportunity will be forced to continuously react to those competitors who have moved swifter and better.

As previously stated in Section I-i, hierarchy is very good in a stable environment

where its rules, procedures and constraints are best suited for doing something over and over. In a volatile environment of rapidly shifting markets, competition and technologies, however, it is inadequate and cumbersome. A rapidly changing environment requires an organization which is responsive, flexible and adaptive. It requires a more fluid structure comprised of more educated, independent, self-directed workers held together by something other than a rigid hierarchal structure. What is needed is a change oriented rather than a maintenance oriented structure. A structure that is task integrated versus functionally segregated; a structure in which people are configured into problem solving groups -- uninhibited by hierarchal positions; a structure which is flexible and responsive -- one with a radically different decision making environment and with more effective reporting relationships.[30]

Of the new business ventures which fail, the biggest reason for doing so is the inability of the founders to manage effectively. The greatest reason for the decline and demise of existing organizations is the inability to manage change -- the inability to remain competitively innovative. Competitiveness for any manufacturing organization lies not only in its product innovation but also its internal innovation which allows the organization to function more efficiently and effectively and consequently satisfy external customers better than the competition. This type of situation implies that each individual within the organization is working 100% productively and in harmony with each other with total effort being directed toward perfectly formulated strategic objectives. While total organizational perfection, whatever that might mean, is impossible to achieve, innovating organizations continuously seek new and better ways to operate. Localized innovations can and should occur within functional areas of the organization but total organizational wide innovation is difficult to impossible to achieve within a segmented hierarchical structure. Segmentation impedes innovation. Organizational wide innovation cannot flourish where segmentation prevails, where security comes in the form of control and where loss of control is the supreme threat. In the innovating organization, security comes not from domination but from flexibility -- from quick reaction to stimulus. Security in innovation and responsiveness is based on trust in individuals and their talents; from getting together the best combination of people to do whatever job must be done; from individuals and functional groups identifying with the entire organization, not from seclusion in an isolated functional department.

Less innovating companies have three characteristics in common:

1) a tall hierarchal structure
2) a virtual absence of lateral cooperation, communication and support between functions
3) managerial tools and assistance either non existent or difficult to obtain

In such companies, four categories of innovation restricting people can be identified:

- **time servers** who are basically retired on the job and are interested in maintaining a serene and peaceful existence
- **defense cliques** restricting information to prevent change which could be a threat to their position within the organization
- **mutual aid and comfort groups** who are resentful of their more ambitious co-workers
- **coalitions of the ambitious** who restrict information in an attempt to monopolize power.

External forces on an organization, both from present or potential customers and from present or potential competitors are requiring that organizations be increasingly innovative not only in its product but in ways to become more efficient and effective. Organizational wide innovation requires resources be better utilized, decision making information be better and more readily available, technological tools used to greater advantage, a higher degree of functional interaction and cooperation and a clear and more focussed sense of direction along with a corresponding supportive environment.

D. Technological Forces Outside and Within the Organization

Somewhere between the external and internal, pull and push forces are the technological advancements which have the potential to allow an organization to operate more efficiently and effectively. New technology is available for use in product design to enhance new product offerings, in manufacturing to improve quality and reduce costs and also for use in the day-to-day operation of the business. Technology usable in design and manufacturing is unique to the particular manufacturing organization and its' product.

Advances in computer technology offer potential strategic advantage to any organization capable of exploiting it. Two areas where computer technology can

create strategic advantage are in the creation of information from data and in the dispersal of information to those who need it. Information, is data endowed with relevance and purpose. The conversion of data into information requires knowledge as does the strategic use of that information in decision making.

In the traditional, hierarchal, bureaucratic organization, information is concentrated in centralized "clusters" within the structure. (Figure 1.) Each functional niche collects and hoards information relevant to its needs. Within these niche areas information tends to be further concentrated at the top, with the manager or area supervisor. To some degree, these packets of information are passed upward in the hierarchical structure to the next information "hoarder". It is not uncommon for this information to be heavily biased and presented for political motives. Ultimately some of this information reaches those people at the top of the structure who can use it to make intelligent decisions affecting the short and long term future of the company. By the time the information reaches those who could use it, it has lost its relevance due to the time lag and also the process of filtration it underwent while being manually transferred, interpreted, distilled and consolidated. One of the strengths of the traditional, hierarchal structure is the ability to collect and store specific information within functional boundaries. This information is communicated verbally or in written form within the function and used for its own purposes. One of the greatest organizational resources is information. For it to be used, however, it must be available. Keeping information isolated and segmented makes its use limited. The proliferation of personal computers in the modern organization has added a whole new dimension to the ability to collect data, transform it into information and communicate it throughout the organization. Information can now be transferred instantly and accurately to anyone who has a need for it. Because of technological advances, we have recently entered the era of the third major evolutionary change in organizational structure: the shift from the command and control, compartmentalized and segregated organization to the **information based organization of knowledge specialists.** [31]

E. The Use of Computers Toward Organizational Efficiency

Much has been written recently on the topics of organizational flattening and downsizing, employee participation and individual empowerment. This can happen when the manual process of collecting, manipulating and transferring data is replaced

by a mechanism of electronic and automatic data transformation of data. Not only can the appropriate information be instantly accessed by those who need it; it can also be stored for use at a later time or for synergistic combination with other packets of information. Hence, this information can form an organizational knowledge base which can be expanded, transported and modified as the need arises. Knowledge which used to reside only within individuals; which was difficult to extract and combine and was easily lost now resides in a much more usable medium.

In the past there were two basic structures after which to pattern an organization; centralized and decentralized. Today, technology driven computer based control systems allow the best of both; the flexibility and responsiveness of decentralization and the integration and control of centralization. [32] A computerized control system assumes many of the communication, coordination, and control functions that layers of middle managers used to perform. Such a system also accomplishes those things which previously were accomplished by a hierarchy network -- structured responsibility, accountability and stability. Now, however, these can be achieved along with reduced organizational complexity. There is, however, a major difference between how these things were accomplished in a hierarchal structure and how they can be accomplished via a computerized integrated structure. As previously discussed, hierarchy tends to stifle organizational wide innovation and responsiveness -- the computer tends to foster and promote it. Information which used to reside within functional areas can now be easily accessed by people outside the function. For example, relevant marketing plans and product requirements are available to those needing such information in the engineering, product development groups. Design information can be shared by those in documentation, literature, customer service, manufacturing and also marketing. Product cost information is also available to people in various functional areas. Having information from a multitude of different areas allows people in all functions to gain a broader perspective of the organization. Seeing more of the "big picture" allows people to question what exists and to better formulate ideas on how things might be made better; how organizational objectives could be better accomplished and how the organization could be more competitive.

In the pre-electronic era, prior to the widespread use of computers, the hierarchal structure assisted upper management in monitoring and controlling organizational

activity. If utilized properly, computer technology can now assist management in this task. This type of electronic information system can form the basis for the organization's infrastructure and also change the role of formal reporting procedures. It can allow businesses of all sizes to more easily adapt to the dynamics of its environment.

F. Information Accessibility and Organizational Integration

When information was concentrated within functional areas, the information available to individuals in the area tended to be specific to that function. Information relevant to other functions could be retrieved from those areas but it was inconvenient to do so. To achieve organizational objectives, functions cannot work in isolation; activities from all areas must be integrated and coordinated in one common effort. To achieve effective integration, functions must have information specific to other areas. For example; for design engineering to develop a product that best satisfies the customer and meets the needs of the organization, it must have information from marketing, purchasing, manufacturing, quality assurance, finance, cost accounting, etc. In like manner, for marketing and finance to determine which new product development projects to pursue, specific information is also needed from a multitude of functional departments. Computer technology now allows the accumulation, storage and collation of information necessary for managers and workers in all areas of the organization to make logical, fact based decisions. [33]

Computer-based information accessibility permits local decision making and decentralized control and allows organizations to be structured in ways not feasible even a decade ago. Technology allows large organizations to run like small ones; responsive, flexible and efficient. It allows groups of people to come together to solve a problem, collect information relative to their needs, efficiently accomplish the objective and then disband. Software technology can provide expert systems, group and co-op systems and artificial intelligence systems to assist in judgment and decision making. Individuals and problem solving teams can operate autonomously and results can be made instantly available to anyone, anywhere in the organization. Information technology, which had once been a tool for organizational expansion, has become a tool for downsizing and restructuring. [34] Information can no longer be concentrated and available only to those at the top. Information must and can be

available to virtually anyone, anywhere within the organization. Information can now be accessible to those doing the real work -- the work directly related to the core function of the manufacturing organization -- the work of product embodiment; both existing production and also new product design and development. Information now allows intelligent decisions to be made at the individual level - it allows group and individual autonomy.

G. Internal Organizational Forces

Internal forces pushing organizations toward change are the demands of owners for a just return on equity and the demands of employees for a more self actualizing existence. Current literature indicates that a medium-sized manufacturing organization structured in the traditional hierarchical manner cannot satisfy the demands put on it by the internal and external forces. The structure, while highly efficient relative to what preceded it, cannot accommodate the fast pace of todays environment. The hierarchical structure, by its' very nature, makes it too unwieldy and too sluggish, too slow to adapt and respond - it is a dinosaur and it is doomed for extinction. The traditional corporate ladder of the hierarchical organization is collapsing because it can no longer carry the weight. [35]

H. The Knowledge Workers: Needs and Responsibilities

Todays employees are knowledge workers. As described by Drucker, the knowledge workers are the people in the organizations of the 1990's replacing blue collar workers from the previously more direct labor intense era of manufacturing organizations.[36] These knowledge workers are neither willing to be exploited nor are they exploiters. They are both independent and dependent; subordinates and also bosses. They have individual mobility yet need access to an organization in which to function. They are employees of an organization and also consultants to the organization to which they are affiliated. Knowledge workers are colleagues and have both significant social and economic status and corresponding bargaining power. According to Drucker, only in a true and long lasting depression does the knowledge worker need a job more than an employer needs the knowledge worker. Since this type of employee has considerable power they must also assume corresponding responsibility. Such responsibility must lie in their individual contribution toward the

objectives of the organization. Specialized knowledge of these individuals has no intrinsic value unless directed to the needs and goals of the organization. The less an organization relies on direct labor to add value, the more knowledge based an organization becomes, the more it must depend upon the willingness of these knowledge workers to assume responsibility for contribution; for understanding objectives, values and performance of the organization and directing their activity accordingly. These knowledge workers are becoming more and more prevalent at all levels of the organization. They want to be treated as a colleague and an associate rather than as a subordinate. Compensation, while still important, is being considered secondary to respect, dignity, job satisfaction and recognition. [37] Knowledge workers are lending credence to Maslows hierarchy of needs theory. People want to use talents, skills and education, versus manual labor, to improve their situation in the work environment. For this reason the environment in which one works is more important than it used to be. Work is a major social activity in ones life -- in some cases the most meaningful activity. People are seeking ways to improve society in general, quality of life so to speak, and are using their work environment as a means to do it. Employees are more aware, more concerned and more involved and are seeking levels of satisfaction far beyond what only monetary compensation can provide. (Table 5.)

I. A Nurturing Environment

Organizations where segmentation prevails are likely to stifle their own potential for innovation, making it all but impossible for any but a few determined individuals to contribute. Organizations that are change oriented will design in a large number of integrative mechanisms. Such mechanisms will remove organizational barriers to communication, interaction with others, sharing of knowledge and greater individual productivity. Such an environment encourages fluidity of boundaries, free flow of innovation generating ideas and individual empowerment. Such an environment is possible with an organizational structure comprised of local, task oriented units to which the knowledge worker can more clearly and closely identify. The closer the association with both the task and also the group performing the task the more personal the relationship becomes. Such a situation leads to greater commitment and greater contribution. The highest proportion of entrepreneurial accomplishments is found in organizations that are the least segmented and have the greatest amount of

integrative mechanisms; structures and cultures emphasizing pride, commitment, collaboration and teamwork. The innovating organization needs two ways to organize people and their activities: a hierarchal type of arrangement with specific tasks for carrying out that which is well known, repetitive and routine and also flexible mechanisms for figuring out how to do what it does not yet know. [38]

The societal revolution of the 1960's and 70's has tended to put a large rift between the sixty year old upper executive and the thirty year old knowledge worker -- differences being manifested in priorities, perspectives, motivations and attitudes; towards society and towards work roles. It is not at all uncommon for executives to achieve status and position by ascending the hierarchical ladder of the bureaucratic organization and be content and comfortable in a relatively inactive and noncontributing position. Such a buffered and isolated position makes it difficult to comprehend the needs and motives of younger employees. Not understanding the needs of today's employees is to be unaware of the tremendous potential which exists in this organizational resource -- the potential to configure an organization which best fits todays business environment while providing a self actualizing work environment for its employees.

This is the dilemma: upper executives content and complacent, unaware of the need for change and the perils of not changing; unaware of the discontent of the younger work force and of the tremendous potential waiting to be unleashed -- a lack of awareness not only of the problem but also of the solution. Or perhaps in some organizations the situation is even worse; an awareness of the problem but refusal to implement a solution due to fear of losing control and/or status. In this era of "knowledge workers" it is vital to the future of the organization that management realize and understand the motives behind employee contribution to the organization; the fact that more employees are seeking an environment conducive to self actualization with associated levels of satisfaction.

Hierarchical structured organizations in their inefficient and ineffective attempt to deal with the rapidly changing environment are expending an inordinate amount of capital. In such a restricting structure, increases in output are being made, but not efficiently. In such a situation, returns on investment is unduly low. It is like trying to get more horsepower out of an engine whose parts have not been tolerenced properly and consequently generates excessive internal losses. More fuel can be forced in and

more power will come out but a disproportionate amount of energy will be dissipated internally; energy which could be gotten out to do work if the engine were more efficiently designed. Change, like acceleration, consumes more energy than does remaining in equilibrium at a constant velocity. Accommodating change in an organization whose structure is not conducive to it will consume an inordinate amount of energy. Energy is not free. Energy to fuel the organization comes in the form of human resources and it must be paid for. Wasted energy consumes capital and the less efficient the organizational engine the more capital is wasted. To do the organizational work which is required to be competitive in a turbulent environment and still give the owners adequate return on equity will require a more efficient engine, one which can run on the same or less amount of fuel, do more work and still increase owner wealth.

J. Organizational Design Changes to Facilitate Human Potential

For most companies, sheer size is a major obstacle to effective operation. De-massifying, that is decentralizing with coordinated control, is the key to honing productive capabilities to a sharper, more competitive edge. Amongst other things this could mean trimming corporate staff. It most definitely means pushing decision making down to the lowest possible level. It means configuring the organizational structure from abstract rigid rectangles on the flowchart into personal, meaningful, objective oriented and inspired entrepreneurial-like teams. Specifically it could mean breaking down a monolithic manufacturing mass into accountable business units held accountable for measurably faster new product introductions and higher quality and better availability of its existing products. It could also mean, amongst other efficiency enhancing measures, decentralized MIS and if necessary allowing the individual units to operate their own information systems best configured to meet their own needs. [39]

The environment in which an individual operates will largely determine how much he will contribute to innovation and a mastery of change. For individuals to deal with and manage change as a way-of-life requires that they find their stability and security not in specific, completely detailed and quantified organizational arrangements but in the culture and direction of the organization. Creativity is not derived from a well ordered situation in which everything is known, defined and spelled out -- creativity and innovation takes place when people attempt to derive order where it does not

presently exist; to configure new and more meaningful connections; to form a synergy out of unrelated pieces; to determine a better way of doing something; to contribute more productively towards the organizational goals and objectives. Empowerment comes not from giving people the solution but rather the problem along with the authority, knowledge and resources to resolve the problem. Innovating companies provide the freedom to act which arouses the desire to act. Organizations that stimulate innovation make problems available to people at lower levels. The more that jobs are formalized with duties finely detailed and specified the less innovation takes place. Low formalization is associated with high innovation. [40]

III. THE ROLE OF LEADERSHIP IN RENEWAL OF THE THE MEDIUM-SIZED ORGANIZATION

A. A Greater Need for Leadership

As indicated earlier, the need for leadership in all organizations is at least as great or greater than it has ever been. This is due primarily to the amount and also the magnitude of forces acting upon present day organizations, both internal and external. The amount and types of activities an organization could pursue to counter these forces and improve its situation is virtually unlimited.

The concepts of employee empowerment, participative management and team orientation are being promoted as a means of extracting the full potential of the organization's human resources. Terms like "world class", "renewal" and "post entrepreneurial culture" are being used to describe organizations operating in a new, enlightened, more responsive and productive manner. In manufacturing, various "tools" such as JIT (just in time), MRP (materials and resource planning) and cellular manufacturing are available to decrease production costs and increase the value-added activity. In new product development, techniques such as QFD (quality function deployment), DFMA (design for manufacturability and assembly) and CE (concurrent engineering) are being tried in an effort to better satisfy the needs of the customer, reduce product development and manufacturing costs, provide a more reliable product and reduce the time to market of new products -- all in an attempt to be more competitive and profitable. New accounting methods such as ABC (activity based costing) are being tried in an attempt to better identify and quantify cost drivers and make more intelligent financial decisions. Throughout the entire organization, under the umbrella of TQM (total quality management) a multitude of local level programs are being implemented to improve overall product and process quality.

Not only are programs and tools being implemented by executives, mangers and supervisors but as individual empowerment takes hold, every single employee could potentially be implementing his/her own program. All of this is good and desirable but it needs to be well planned and cohesive -- it needs to be orchestrated. Organizational leadership must provide a means for all this activity to be directed and focussed rather than have it be scattered and dispersed. As beneficial as all these programs and activities could be to the organization, they could spell disaster if not

controlled and coordinated. As previously indicated, these activities consume capital and resources and if not managed properly the return on investment might be negative or it could divert so much attention from the core function as to leave the organization even more vulnerable.

It is a common belief among authors the likes of Zaleznik, Bennis, and Nanus that there is a general shortage of leadership within all sectors of this country and especially within goods or service producing organizations. Nanus points out that there has been some notable incidence of admirable leadership in manufacturing organizations -- Iacocca at Chrysler and Welch at General Electric -- but relatively few compared to the great need.[41] Nanus goes on to state that much of the responsibility for failure of organizations to adapt to the new realities of the present day environment can be attributed to the inadequacies of leadership. Within an organization, only those at the upper levels have the authority and responsibility to change the system to make it work better. Leadership at this level can redirect the attention of managers and workers at the lower levels of the organization to tasks more appropriate to the challenges of today and tomorrow and to those activities most beneficial to the organization.

B. Short Versus Long Term Organizational Needs

Organizations need to have a balanced budget of activities; and have resources directed accordingly. There must be a proper balance of activity given to todays needs and also the needs of the future. In a medium-sized manufacturing organization, the most critical short-term activity is that of satisfying todays customer -- supplying a quality product when it is wanted. Essentially this means getting product out the door. The executive staff, and even more so the managers and supervisors, must be competent in dealing with day-to-day problems of production and delivery to leave enough time for the necessary long range planning. This implies a proactive versus reactive mode of operation.

The leader of the organization; the CEO, COO or whoever must determine what the proper balance of short and long range activities is for his/her organization and then ensure that resources are directed accordingly. The majority of the CEO's time and of the executive staff's time should be directed towards preparing the organization for the

future. Middle management should devote some time to long range planning but their prime focus must be on present and short range problems.

C. Leadership Roles, Responsibilities and Characteristics

The key leadership position in the organization has a tremendous amount of power associated with it. Power is the potential a person has to alter the behavior of others. This top leadership position involves the desire to use power in the best interests of the organization and its members. Personal influence might be construed as leadership but not when it serves the purpose of enhancing the ego of the leader while diminishing the self esteem of those being led. [42]

D. Establishing the Corporate Vision

Politics and power are neither good nor bad; they are neutral. It is their frequent misuse, perversion and excesses by the upper echelon which causes others to be justifiably suspicious of the motivation behind the actions of an organizations' executives. [43] Leaders can be good politically without being political. It is the manner in which power is used that can be either beneficial or detrimental. There needs to be a recognition of collective purpose between leader and followers in an atmosphere where followers willingly yield power to leaders in exchange for the coordination, unity and security the leader can bestow. This is transactional leadership: the interaction between leader and follower whereby gratifications are exchanged in a political marketplace. The followers need something; leadership fills their needs, and the followers yield power to the leaders. The object in these cases is not a joint effort for the collective effort of followers but a bargain to aid the individual interest of persons or groups going their separate ways. This contrasts to transforming leadership which elevates the aspirations of the followers through the teaching, mentoring and coaching of their leaders. Both leadership concepts are based on value sets. The transactional leaders are those of "means": honesty, responsibility, fairness and the honoring of commitments. The transforming leaders are more concerned with "end" values: liberty, justice and equality. [44]

There is good reason for regarding followers as the most crucial factor in any leadership event. Followers in any situation are vital; they as a collective group of

individuals accept or reject the leader and as such actually determine whatever personal power the leader might have. [45] The effectiveness of a leader is greatly dependent upon the style of the individual followers. Strong, independent workers reporting to a dictatorial leader is a volatile combination. So too is a group of people accustomed to obedience and response to directions and a leader trying to make them organize and manage their own work. It is therefore mandatory that leaders at least partially adapt to the style of their followers before trying to change the traits of the followers. [46]

True leaders articulate and define what had previously remained implicit or unsaid; they have the capacity to influence and organize and to lend meaning to the actions of individuals of the organization. They communicate meaning throughout the organization, creating a common wealth of learning which in turn makes an effective organization. They instill trust and confidence and imply accountability, predictability and reliability - and this is the glue which maintains the organizational integrity. An organization is healthy when it has a clear sense of what it is and what it has to do.

Effective leadership requires management of self and is in fact the creative use of ones self. It requires having an accurate appraisal of ones own worth; recognizing ones strengths and compensating for weaknesses; the capacity to discern the fit between ones perceived skills and what the position requires. The essence of leadership is the business of making others feel good about themselves. Leaders retain many of the positive traits of children; enthusiasm for people, spontaneity, imagination and unlimited capacity to learn new behavior. Leadership requires a fusion between a positive self regard and an optimism for a desired outcome. [47]

At one time it was thought that "leaders are born, not made". There was also a common assumption that certain traits were essential to leadership success. There is now a more balanced viewpoint. It is now recognized that certain traits increase the likelihood a leader will be effective but do not guarantee it. [48] The relative importance of different traits depends upon the the nature of the situation. On the basis of a five year study of ninety outstanding leaders and their subordinates, Warren Bennis has identified four common traits of all ninety leaders. [49]

1) **Management of attention:** the ability to communicate a sense of outcome, goal or direction that attracts followers.

2) **Management of meaning:** the ability to create and communicate meaning with clarity and understanding
3) **Management of trust**: the ability to be reliable and consistent so people can have something and someone to rely on
4) **Management of self**: the ability to know ones self and to use ones skills within limits of strengths and weaknesses.

Heresy and Blanchard suggests that leadership is a dynamic process, varying from situation to situation and dependent upon characteristics of both the leaders and the followers. [50] They complied findings on those who have studied leadership traits and those who have approached leadership from an attitudinal standpoint. Based on studies done at both Ohio State and University of Michigan they have proposed a managerial grid describing a spectrum of leadership styles (Figure 4). Heresy and Blanchard contend that there is no one best leadership style -- one that maximizes productivity and satisfaction, growth and development in all situations. Their research in the last several decades indicates that successful and effective leaders are able to adapt their style to fit the requirements of the situation.

In the innovating, post-entrepreneurial organization, emphasis is placed on managerial leadership which exhibits and also promotes interpersonal skills, networking, cross-functional thinking and cooperation, integrating and facilitating, change initiation, project organization and control. Rewards are based on contribution and the ability to mobilize others and inspire them to contribute to full potential. [51] Future organizational leaders must create a sense of security amidst a sea of change. They must provide people with balance between a sense of belonging and cooperating while still having the ability to control their own destiny. They must eliminate anxiety associated with change and channel energy into real work. It is a leaders responsibility to direct his own natural aggressive energy into appropriate value added activities. Leading with maturity requires the tolerance of others and their aggressiveness and the directing of that energy towards achieving organizational objectives. Superior organizational performance will require leaders who have overcome their own political anxieties and the need to exert control over others. Leaders accomplishing real work from the activities of others will derive their satisfaction from such accomplishments. [52]

Leadership entails **providing the organization with vision** -- an articulate view of a realistic, credible, attractive future -- a condition that is better in some important way than that which presently exists. Vision might be thought of as predicting the future from the past and present. The visionary leader is one who can step outside of the present and project into the future. Mysterious and supernatural as this might sound, there are some very real and concrete methods for formulating this required vision of the future:

- **extract existing data** from within the organization and organize it in such a way that an extrapolation can be made to determine possible future scenarios
- **establish a dedicated data base** to assist in future predictions: a computerized management information and decision support system into which the relevant new data is entered.
- **set the direction** for the organization to follow by articulating and communicating to the organization specific plans for arriving at what has been envisioned.

There is no shortage of data in the typical organization; the problem is that it resides in a multitude of places and in a variety of forms. It is possible to extract this data from files, records and from individuals and to compile it into meaningful information to assist in future decision making. Information on markets, emerging technologies and future manufacturing methodologies could all be used to assist in synthesizing a future view of the organization. Once extracted, this information can be compiled into a database configured expressly to assist organizational leaders in formulating the required future vision. If designed properly, this database could form the knowledge library for the organization. It could be configured as an expert system to assist in day-to-day decision making as well as an "electronic crystal ball" to assist in gazing into the future.

E. Setting the Direction for Activities

Having established a vision for the organization, leaders must also **set the direction** or chart the course the organization is to follow to turn the vision into reality. Vision provides a view of the future, direction must provide a bridge from here to there. Establishing the direction for the organization does not mean formulating the detailed plans on how to get there -- that responsibility is given to empowered individuals and results oriented work groups. Leadership involves matching the vision to the needs of

the customers, the employees, the shareholders and the organization itself. Leadership involves **aligning people** in such a way to allow them to organize and direct themselves toward the vision. It involves showing people how to use their own skills and resources to achieve the change; it involves giving each individual the feeling that they are at the center of something very important and meaningful. Leadership involves being the **change agent**, the person who mobilizes the entire organization to take whatever measures necessary to achieve the desired vision. Leadership involves being the corporate change champion who remains clearly focussed on what it is the organization is to be or what it is to achieve and keeps everyone else focussed on the common objective. Leadership involves **assigning responsibility** and **demanding accountability** of the executive staff. Leadership in this decade and beyond requires someone who can commit others to action, convert followers into leaders and other leaders into agents of change. Such leaders must provide results-oriented people with the intensity of commitment necessary to produce meaningful change. [53] True leaders are results-oriented and have the ability to establish results orientation in others. Leaders have intensity coupled with commitment -- leaders have passion. As the primary agent of change, the leader of the organization must be the one to **recognize barriers and impediments** to the required change and assign responsibility for their removal. If necessary the leader must reconfigure the organization to give everyone the best chance of achieving what it is they are to do. In most organizations, the elements exist for transforming change to occur; effective leaders recognize such potential and configure the right pieces in the proper order. Such leaders can structure the organization to best utilize existing resources. They need to realize where the real work is done and create a structure such that those doing this work feel responsible for their actions and see progress toward the vision. Hostile, internal competition must be eliminated; morale must be preserved and strengthened and cooperation enhanced. The skill of the corporate leader, the primary change enabler, lies in the ability to envision the new reality and direct activity towards it; the ability to articulate direction and spare the organization from drift induced change.

F. Communication of the Vision for Renewal of the Organization

Before any such meaningful and comprehensive change can occur, it is essential

that others in the organization see and share in the vision of the future -- for them to make this vision their reality. Leadership means getting others to feel the need for change and having them generate the passion necessary to make it happen. [54] Leadership involves **communication** of the vision in order to challenge others to involve themselves in its achievement.

Renewal of an organization comes about when the vision of the future is communicated to everyone and everyone's activity is centered around making the vision reality. Vision by itself, much like any good idea, is worthless without the plan and associated activity necessary to carry it through to fruition.

The continually renewing, organization is fueled by a three part formulation:

- the **vision** established at the top and represented in the form of goals, objectives, strategy, mission and values
- the **structure** designed to support the activity needed to make the vision reality
- **individual ownership** of the vision at all levels by those who are empowered and involved in the necessary details of change.

Renewal comes about by the Pygmalion effect -- what one expects is what one gets. If superior results are expected and recognized, the tendency is for people to achieve such results. When mediocrity is accepted and not challenged, similar results will be achieved. When leaders make it clear to followers what needs to be done and why and then challenge followers to action; chances are good the goals will be achieved. When companies, because of poor leadership dispirit individuals, the ability to change is impaired. When individuals are challenged and empowered via strong leadership just the opposite can happen. People are the only source of renewal to organizations. Renewal begins by finding the best people, challenging them with high performance standards and providing the required security in case of failure. Renewal lifts people above the tedium and dreariness that constitutes many jobs and gives them the challenge and opportunity to effect positive, meaningful change -- to create something new and better. [55] Leaders have the ability to tap into the spiritual and emotional resources of the organization and inspire individuals to new levels of performance and need satisfaction. Individual self concept sets the boundaries of accomplishment -- people can do whatever they believe they can do. Leaders must provide causes with which people can identify and ones that they believe are worth supporting. [56]

G. Configuring the Pieces -- Orchestrating the Organizational Symphony

As organizations grow larger and evolve into more complex entities, relationships tend to become more political. This is due to the previously mentioned isolated and segmented structure, associated localized power bases and different perceptions that arise from different positions. Leaders must **establish and reinforce a culture and configure a structure** that creates a commitment which transcends the immediacy of localized, personal interests. Leaders keep politics out of human relationships by lending substance to the work of others thereby making that work meaningful and interesting. When people are insecure in their position and in the worth and substance of their work the tendency is to turn to political processes as a means to achieve required security.

All else being the same, it is a natural human tendency to be more dedicated to ones work when the work is meaningful, the goal to which the work is being directed is clear, there is control over how the person pursues the work, the progress is visible and the effort is recognized. As organizations evolve and grow and become more hierarchal and segmented, people get further away from the end result of their work. In a manufacturing organization this is true in the production area and also support functions. This causes the link between effort and results to become obscure and goal achievement satisfaction more difficult to achieve. This also leads to feelings of insecurity, nonproductive activity and political tactics. The key to effective utilization of human resources, greater satisfaction of individual needs, more efficiently and effectively meeting the needs of the customers, the stakeholders and the organization itself is to achieve a closer bond between the individual and his/her work. This can be achieved by changing the organizational structure from predominately hierarchical to one comprised of local, cohesive, integrated, self-directed, self-supporting activity centers. [57] Details of such a structure will be covered in Section V.

The challenge of leadership in the mid-sized manufacturing organization is to capitalize on the advantages the operation has in terms of size, flexibility and mobility and make the organization an innovative, self renewing, continuously improving, competitive and profitable company. As stated earlier, this size organization is somewhere in the middle of the spectrum in terms of size and structure. As such, the architects of organizational structure have a good deal of latitude to mix and match; to use whatever works the best to achieve the desired results. Successful leadership

involves a multitude of skills; the application of these skills ranging from the conceptual through the emotional/inspirational to the concrete. As previously stated, it involves conceiving a **vision** for the organization, determining which **direction** to go, formulating the **strategy** and establishing a **plan** for achieving the objective. It involves **communication** of the vision to all members of the organization and creating the proper environment via **structure** most conducive to achieving the vision. It means **inspiring** individuals toward a new and better future and **empowering** them to make it happen. It means **integrating** the various efforts of individuals, groups and programs and maintaining **focus** on the goal and objectives.

Leadership means championing the cause of getting the organization from where it is to where it will be in the future. It means being the arranger, the composer, the conductor; the orchestrator of the organizational symphony.

H. Improving Leadership Skills

There are ways and means available to improve leadership skills at any level of the organization. The procedures would be relatively the same although the material and subject matter covered and the individuals with which one interacted would vary.

One of the first and easiest ways to improve ones leadership skills is to read -- not only of what comprises good leadership but also of those who are considered good leaders. There are a multitude of current books and articles on the subject of leadership and also how it applies to manufacturing organizations. Those appearing in the reference section of this paper are representative works of todays experts on the subject. There are also many case histories available describing organizations that have been renewed by executive leadership. Some examples of outstanding leadership are: Rod Canion at Compaq Computer, [58] Robert Haas at Levi Strauss and Company, [59] Jack Welch at General Electric, [60] Raymond Smith at Bell Atlantic, [61] or Ralph Stayer at Johnsonville Foods.[62, 63]

Executive development programs, seminars and conferences specializing in leadership skills are also available. These have the advantage of not only exposing individuals to the concepts and tools but also provide peer interaction and networking opportunities. Programs range from inexpensive one day seminars offered by Career Track to multi week offerings of renowned business schools such as Harvard, Columbia and Penn State.

For a more ongoing exposure to ones peer executives in other local businesses, there are professional organizations and societies available either within the community or within the state. One such example is the Young Presidents Organization.

Regardless of what skill one tries to improve, only so much can be gained by reading and exposure. The real improvement comes with practice. Leadership, like any other skill needs to be practiced to be improved. Practice requires discipline. Practice means doing -- trying something, monitoring results and improving the methods. Disciplined practice can begin with the senior executive formulating a future vision -- some way the organization in the future will be significantly different than it is today. This vision can come about by self reflection, from executive staff discussion, by brainstorming with managers, by input from those outside the organization or from any combination thereof. Once the vision is clear, strategy and detailed plans for achievement need to be committed to paper. Individual responsibilities need to be assigned, starting with the executive staff and down throughout the organization. Corresponding accountability must also be requested. The vision then needs to be communicated to all those being in some way affected. The necessary training, tools and structural mechanisms need to be made available to those involved in the activities. The monitoring of progress needs to be done, results analyzed and future action planned. When distilled to its most basic form, the successful accomplishment of anything is nothing more than project management. The disciplined practice of leadership requires action and takes effort and conscientiousness but without such effort, skills will not be enhanced and neither the senior executive nor the organization will be any better off.

IV. THE CHANGE PROCESS

A. Awareness of a need to change

Any change begins with an awareness of a need to change brought about by a dissatisfaction with what presently exists.[64] Such an awareness can originate any place within the organization or it could be felt at a number of places at the same time. Two likely places for this awareness to occur would be at the CEO or owner level and also where enlightened, conscientious, knowledge workers are having difficulty doing their jobs effectively. At the executive level, accurate and complete financial information should provide obvious early warning indicators of organizational difficulties. Some pertinent figures of merit which might indicate impending problems are return on sales, return on equity, the ratio of overhead to direct labor hours, or various other productivity/efficiency profitability indicators. All these plus many other available indicators should provide an awareness that the organizational engine is dissipating too much energy internally in coping with burdensome operating systems.

Every organization has a pulse, a barometer which indicates its overall health or climate. This climate cannot be determined directly from financial reports although climate indirectly and subtly does affect performance as indicated on such reports. Climate is the aggregate of such subtilities as feelings, opinions, attitudes and morale of the general work force - those closest to the action. The internal health of the organization can be quantified by such things as departmental quality costs (costs incurred due to non-conformance), absenteeism and attitude or opinion surveys. The initial quantification can serve as a benchmark against which continuous improvement is measured. In a conventionally structured organization it is difficult to impossible for executives to directly read the overall pulse of the organization because of their separation and isolation. Frustration is the emotion which results when things are different from what a person feels they could or should be. Chances are good that the new worker, the knowledge worker, in a traditional organization will find a vast difference between what they feel should and can be be and what actually exists. Consequently there is a high probability of worker frustration. Upper management must continuously monitor the health of the organization, not only as indicated on financial reports but as indicated by feedback from knowledgeable employees. Management unwilling to receive this crucial feedback risks the future of the

organization; either they will not know until it is too late that the organization is seriously ill or they will be able to effect a cure but the cost of treatment will be excessive.

It is suggested that there are four basic types of individuals in a conventional organization -- those that are not considered world class nor striving to be; those not yet renewed with empowered employees; those with mediocre records of customer satisfaction and/or financial performance. The four categories of employees are:

1) people who are acutely aware of what is happening and are instrumental in making things happen to the extent that structure and culture allows
2) those who, although not involved in making things happen, are aware that something is happening, but perhaps not sure what.
3) those who do not know what or even if anything is happening
4) those who deliberately try to prevent something from happening

Even in a conventional structure, Type 1 people are those who recognize problem areas and short comings and who try within their organizational imposed limitations to improve the situation. Type 2 people may be aware of problems but unwilling or incapable of affecting any change. Type 3 people are surrounded by blissful ignorance not knowing and not caring that there might be any problems and totally oblivious of any better environment. Type 4, the truly dangerous people are those who prey on the inherent weaknesses of the conventionally structured organization, who foster these weaknesses and use them for personal advantage. These are the people who build empires and surrounded them with walls for their own protection. These are the isolationists, non segregationists; those who resist or sabotage the positive change efforts of others in order to protect their own minority interests.

Within any organization there are people in Category 1 who recognize existing problems and are acting within the limits of their authority to remedy the problems. But again, because of the restricting nature of the hierarchal structure, there are severe limits to what can be solved at a local level. The point is, there are people at various levels who have an awareness of what is wrong and might even have solutions if only upper management would listen and allow these enlightened and competent individuals to implement improvements.

People are most dissatisfied and frustrated when they expect much but realize proportionally little from their work. Knowledge workers do in fact expect more, and

consequently need to get more from their work in order to remain satisfied. It is not necessarily the character of the work which determines satisfaction but the importance the worker has been made to feel in himself -- the recognition he receives and the meaningful relationship between his work and the benefit it has to the organization or to society in general. To minimize the symptoms of malaise and to restore the natural tendency for cooperation requires a strengthening of the membership ties between the individual and his activity group. [65] A key to organizational effectiveness is getting and keeping people enthused: removing impediments, instilling a sense of ownership, and team decision making in an atmosphere conducive to free individual thinking and questioning. Essentially what is needed is an environment typically found in a small, innovative, entrepreneurial, start-up company. [66]

B. The Need for an Enabling Environment

An entrepreneurial environment is needed to allow people to make the type of changes they believe in -- an environment which decentralizes the organization and shifts emphasis from the hierarchy to the individual. The flexibility to allow sufficient room for individuals to innovate is an important ingredient missing in most corporate environments. Most people with entrepreneurial spirit leave an organization because of frustrations at attempts to innovate. People with entrepreneurial spirit have a deep personal need for achievement. A powerful incentive for getting their enthusiastic contribution is allowing them the freedom to help achieve the new vision for the organization. In a conventional structure, official organizational systems are often bypassed in an attempt to achieve faster results. Unless the official systems are as easy to use as the "underground" ones, the environment is unlikely to support widespread entrepreneurial effort. Entrepreneurial activity is not only beneficial for short term achievement but it also provides the broadest business training for entrepreneurial oriented individuals which in turn provides the basis for more successful entrepreneurial ventures. [67]

An entrepreneurial environment is more stimulating and interesting than one that is hierarchal and bureaucratic. If work is made more exciting more people will want to do it. Long hours are tolerable if one has control of what one does, knows clearly what is expected, has well defined milestones and is given time to "recharge" between major

expenditures of energy. Ones work must be oriented toward opportunity. The personal aspect of ones work must be made more important. Organizations must seek different ways to organize to get work done -- they must be more people sensitive, less bureaucratic, more cooperative, less hierarchal. Creating synergies within entrepreneurial units will enable organizations to do more with less. Having focus while being friendly will enable organizations to be both fast and flexible. [68]

Financial health and well being of an organization is mandatory for its long term survival. Financial health, profitability, is an indirect result of effective resource utilization. People are the greatest resource of the organization and the only true means to sustain competitive advantage. Providing whatever is needed to insure this resource is optimally directed toward the goals of the organization should be upper management's prime concern.

Awareness of a need to change does not necessarily result in action to make the change. There are many examples of individuals and groups of individuals who see a need to change but for various reasons do not have the desire. Reasons for this might be fear of the unknown, unwillingness to expend the effort necessary to make the change or thinking that they would not be around long enough to see or enjoy the benefits of the change. The owners and or shareholders of a conventional mid-size, manufacturing organization and more than likely all of upper management tend to be the oldest members of the organization; not uncommon for them to be sixty plus years of age. Chances are they are not going to be the ones to get involved in the hard work and nitty gritty details of the change process. This task will be carried out by the facilitators and the doers of the organization but can only be done with the approval, guidance and support of executive management.

C. Commitment to Making the Change

Once there is an awareness of a need to change, what is then needed is the desire to change and executive level commitment to and support of the change process. The role of executive management must be to clear the path for change to occur by removing barriers to those charged with the actual change related tasks.

The type of change required in the typical organization to achieve the desired objectives cannot come about by a piecemeal band-aiding of the existing system. The entire network of organizational interrelationships must be restructured from that

of segmentation to one of integration. Individual effort must be oriented from separatist to cohesive.

Commitment to the restructuring effort at all levels must begin by commitment at the executive level. The owners must grant to the CEO authority for undertaking the needed changes and must make it clear to the board of directors or executive board that nothing short of 100% commitment to the program and cooperation with the CEO will be tolerated. Because the long range planning and direction duties belong to the executive staff, it is this group of people who should oversee the change related activities. It is ironic that the very people who have made it to the top of the hierarchical structure must now be responsible for dismantling it and transforming the organizational structure into something more effective. Because of the threat this presents to the security of those at this level it is essential that it be made known to them that this is more of an opportunity than a threat -- that this is a chance to lead the organization toward its vision of the future, to contribute something worthwhile and to achieve something better than what now exists. As indicated previously, there are various means of enhancing executive leadership skills and to become more in tune with what is happening in the world of manufacturing organizations today. The owners and CEO must be firm in demanding accountability for the task of restructuring. Whereas the existing hierarchy made it possible for people to remain segmented, establish kingdoms and engage in territorial feuds; accountability for the restructuring task will require teamwork, communication, cooperation and leadership skills. If present skills are inadequate then they somehow must be made available to these change leaders. Executive staff members can work to improve skills individually and can also go through executive development programs as a group to reinforce and learn from one another and to learn to work together effectively as a team. Such programs can be made available in-house or at some location remote from the company. The latter is preferable because it would allow temporary detachment from daily organizational problems and distractions and permit more concentration and focus on the material being presented. Rejection of this responsibility to improve for leadership and team oriented skills must be accommodated by assignment to another function. If the executive group cannot or will not work together to help achieve the objectives then they will not be able to work with and through others to achieve them.

This executive restructuring team must lead by example; it is they who must set the tone for the rest of the organization to emulate. They must establish credibility and be seen as supporters of the restructuring movement. There can be no double standard; employees at other levels cannot be expected to operate in one manner when the leaders behave in a different manner.

D. Establishing the Objectives of Change

Once there is an awareness of a need for organizational change and a corresponding commitment and desire to do so, a plan to accomplish the change must be formulated. The process of arriving at the plan and of carrying it out is very similar to the approach to new product design and development. In order to satisfy a particular market, it first must be determined what is desired from that market. Only when these needs have been agreed upon and stated quantitatively can the design of the needs satisfying product be decided. When a competitive product is posing a threat, an analysis is performed to determine why customers are buying it, why one's own product is deficient and what can be done to counter the threat -- either by redesigning an existing product or developing a new one. When an organization is no longer competitive and falling short of satisfying the needs of its stakeholders it must first be determined what in the present organizational design handicaps and presents barriers to being competitive and to what extent a redesign or totally new design must be done to achieve the organizational objectives.

Organizational objectives, the reason for existing, fall into four categories, all based upon need satisfaction:

- **Owner** -- the need for an adequate financial return on investment, on owner equity
- **Customer** -- the need for a product that solves a problem or satisfies a desire
- **Employee** -- satisfaction of a myriad of needs; security, social/affiliation esteem/recognition, satisfaction through self actualization (Maslows hierarchy of needs)
- **Organizational** -- those things that the organization must do to provide the continuous improvement necessary for environmental fit, competitiveness, long term viability, and the ability of the organization to satisfy the needs of its

stakeholders. Stakeholders are those having a personal interest in the short and long term health of the organization.

In a manufacturing company, overall competitiveness comes from a competitive product and from a competitive organization supporting the product -- actually supporting the customer who buys the product. A competitive product, one that a customer will buy over a similar one from a different manufacturer, is one which is perceived to offer greater satisfaction. It is the right product in terms of value and it is offered in the right place and time - when it is needed and also in a manner easy to obtain. A competitive organization is one which continuously keeps ahead of other companies in offering the aforementioned products; one which continuously does more with less, one which is innovative in finding new and better ways to meet the needs of the stakeholders.

The objective of any change should be to minimize threats to the organization while maximizing opportunity. Increased demands from more discriminating customers is a threat to an organization which has difficulty responding to those demands. As previously indicated, the same situation could also be an opportunity to whoever can respond faster and better than other competitors. Decreased net profit and return on owner equity due to operational inefficiencies is most definitely a threat to the long term viability of the organization. A more highly educated and motivated work force, seeking independence, autonomy and self actualization, could be seen as a threat to insecure and myopic executives -- a threat both to their own position and to overall stability of the organization. To those who are more secure and visionary, however, this new work force could be seen as the key element for future success. The very size and structure of the organization is a threat to itself but it also holds the ingredients for the foundation of something new and better.

In a manufacturing company, the objective is to give the customer what he wants better and faster than the competition.

Factors in achieving this are:

- having a knowledge of the **technologies** necessary for competitive new products
- the ability to stay **close to the customer** to know intimately what he wants and when
- a **flexible and fast responding** organization that allows fast throughput of new products -- matching technology to market needs

- **organizational efficiency** such that new products are price competitive yet provide adequate return on owner equity

From the broadest perspective, the reason for changing the organization is to more effectively achieve the objectives of its very existence -- to better satisfy the four areas of need: **customers, employees, owners** and the **organization** itself.

E. A New Structural Model for a More Effective Organization

The traditional organizational hierarchy is actually a composite of hierarchies formed from individual hierarchies in the various functional areas. In a conventional organization, the focus of individuals is within one's own hierarchy. People focus on advancement within the function by concentrating on the most visible activities within his/her own function to gain the attention of the people above. The very essence of a conventional organizational chart and the model of a hierarchical organization is one of isolation, bureaucracy, boundaries and perceived limitations. It focuses ones concentration on narrow patterns and promotes self serving and domain oriented activities. (Figure 1.) The conventional pyramid model puts on the bottom those people most closely associated with the core function task being performed and those on the top the ones furthest removed from the task. The pyramidal organizational chart infers a relationship between a leader and followers but it also infers a long and weak link between those at the top and those at the bottom -- between those with the vision and the plan and those involved with the detailed work of accomplishing the organizations core functions.

For a static organizational model, the inverted pyramid (Figure 5) is much more accurate and relevant than the conventional pyramid. It places the core activity of the organization and those most closely associated with the value added aspect of the activity on the top and those who support the basic activity underneath. This model conveys the purpose of the organization and better depicts the interrelationships of functions. It allows individuals to see how their activity fits in and the relationship of the activity to the integrity and strength of the organizational structure. This model more accurately conveys the role of management; to support those closet to the activity -- to provide the foundation, and environment most conducive for task accomplishment. The higher the management level, the greater the support role and the greater the responsibility for such support. Figure 6 depicts the core and staff functions in proper

perspective; rather than showing support functions as some isolated, self serving triangle or rectangle on a conventional chart it shows them establishing the foundation for the core functions. The very term "support" tends to connote something which is less important than that which is being supported. Without an adequate supporting foundation a building cannot stand; without an adequate supporting root structure a tree cannot withstand the rigors of its environment. So too an organization - without adequate supporting functions the main functions cannot operate. All relationships are more accurately depicted in the inverted pyramid model of the organization. The upright pyramid model depicts the ills which affect most conventional organizations; the inverted pyramid model depicts the way things need to be in present and future organizations.[69]

F. Employee Satisfaction: a High Priority

The inverted pyramid model is a static model and as such does not convey the dynamic operation of the organization. Figure 7 is a block diagram of the organization depicting how it is intended to function to achieve its four need satisfying objectives. It shows inputs, outputs and feedback paths both internal and external and indicates how the organizational system responds to changes in stimuli. The key functional element is D; the leaders who continuously monitor the extent to which the organizational "system" is fulfilling the needs of its stakeholders: owners, employees and customers. Operating within Block B are the individual employees. If these people are being poorly utilized and/or are minimally satisfied then the entire organization is operating inefficiently and ineffectively. If loop #1 is not in control, if the people are not satisfied or are not allowed to achieve their potential, then the rest of the system is in jeopardy.

The prime emphasis of todays service and manufacturing organizations appears to be on customer satisfaction. This is as it should be and needs to be. It seems to be somewhat overlooked, however, that in order for an organization to satisfy its customers it must first satisfy its employees. It is unlikely that an organizations employees will truly care about the external customers or even their internal customers when they themselves are dissatisfied. Employee satisfaction leads to a quality product, satisfied customers, profitability/ROE and an organization better suited to withstand the various forces acting upon it. It is the responsibility of the organization's

leaders to configure a structure and establish an environment which first satisfies the needs of its only true resource -- its employees.

G. Focusing on Core Functions

The primary purpose of a manufacturing organization is to configure a physical embodiment of something for which someone has a need; to make something, to build something, to put together non-related parts and pieces to form something that previously did not exist. Hence, the actual production of the item and all the associated processes is the essence, the heart of the manufacturing organization. All other activities needed to accomplish this purpose could then be considered support functions.

Some of these functions support the day-to-day manufacturing activities while others support those activities which will be performed at a later date. Purchasing, distribution and the various quality related functions support the immediate needs of the manufacturing processes. The marketing and new product development activities support the future needs of the manufacturing organization. It is the responsibility of marketing to identify market or customer need and to define this need in terms of product function and product features. This definition, along with target manufactured costs and new product introduction dates comprises the product requirement request furnished to the engineering design and development function. It is the responsibility of engineering to then translate this functional requirement into the detailed embodiment of the product and to supply manufacturing with a manufacturable design, along with the necessary documentation which conforms to the product requirements. After the actual manufacture of the product, marketing, via sales, distribution, advertising, etc., completes the sequence by getting the product to the customer. (Figure 8)

H. Understanding the Relationship of Activities to Core Functions

The core function of a manufacturing organization is to produce a product. Marketing supports this function by defining the product in the concept stage and then getting the product to the customer once it is available. Engineering supports both the manufacturing and marketing functions by detailing the embodiment of the marketing definition and by supplying these details to manufacturing in the form of required documentation. The efforts of both marketing and engineering are supportive of the

manufacturing function; these three functions work in harmony to achieve the long term corporate objectives via continued customer satisfaction of the company's products. The other organizational functions also provide support either directly or indirectly. (Figure 6.)

Benefit can be derived from all people knowing more of these relationships and of the overall internal operation of their manufacturing organization. It is important to understand the objectives and core function of the organization and how individual activities interact with others to support the core function. In a hierarchical structure, represented in conventional pyramid form, the relationship of activities, functions and objectives might not be all that apparent. In all times, particularly in those of turmoil and turbulence, an organization must be constantly aware of and involved in achieving its primary purpose. Losing sight of its primary purpose will cause the organization to become non-responsive and non-adaptive and like the oversized dinosaur -- extinct. Having the awareness of how various organizational activities need to interrelate to support the core function enables people to make intelligent decisions on how to perform their activity in the most efficient and effective manner.

I. Creating an Innovating Environment

To become more responsive, more adaptive, more innovating and more proactive; barriers to such activity need to be identified and removed. There must be changes to or elimination of the politics, practices and procedures, that thwart the efforts of the organization's intrepreneurs; those people who Pinchot describes as "the dreamers who do" -- those who take hands-on responsibility for creating an innovation of any kind within the organization.[70] It is not necessarily the overall size of the organization that forms impediments to intrepreneurship but rather the existing structure and mode of operation. The medium-sized operation is particularly well suited to be successful with creating an intrepreneurial, innovating environment. This size operation should have the necessary resources, both people and capital; some degree of a successful management team and should still be mobile enough to effect the necessary change to its mode of operation.

To continue to do business as usual is an almost certain guarantee of disaster and might very well be the factor that condemns an organization to extinction. The overwhelming majority of innovative organizations exploit change and utilize people of

intrepreneurial spirit to assist. The more knowledge people have of the organization and the relationship of functions and activities, the better able they are to detect incongruities -- differences between how the organization should and could be operating and how it actually is operating. The intrepreneurs are those who recognize such problem areas and attempt changes which will resolve them. The intrepreneur upsets and disorganizes and sees change as healthy and normal. The successful intrepreneurs create value as a means of contribution to the organization.

To achieve the type of operation needed for future success, organizational leaders must make each existing manager and each individual worker greedy for new things. People throughout the organization must be made to realize that **innovation will be the norm** and that it is the best means to preserve and perpetuate the organization; and also that it will be the foundation for individual success and job security. A new organizational structure and method of operation must provide such a system for innovation. There must be periodic reviews of what exists and what is old and perhaps what needs to be abandoned; whatever is obsolete, unproductive, misguiding and burdensome. Ever so often, perhaps every three years, each product, policy and procedure must be put on trial for its life to make sure productive resources for tomorrow are not devoured by the past. This process of continuous improvement begins with a well communicated future vision and supporting strategy and plans. Each executive staff person, each manager, each activity leader and each individual must then be held accountable for achieving their portion of improvement related change -- for reviewing what exists discarding that which does not function effectively and replacing it with something better.

J. Product/Policy Review and Improvement

Product line proliferation can be a real yet subtle resource drain for medium-sized manufacturing organizations. Evolution from an entrepreneurial sized or oriented venture might easily result in lax product line policies and the monitoring thereof. Inefficient product management could result in the company retaining marginally profitable or even loss items. This could be the result of keeping product in the line to serve special interest customers or to appease powerful internal supporters. It is not at all uncommon to keep products active only because their actual contribution to profit is unknown due to poor and archaic cost accounting methods. New cost accounting

procedures, such as activity based costing, are being employed in an attempt to better assess the true profitability and the burden of products on an organization. It is important that the manufacturing organization continuously monitor its product line to make sure that current products are compatible with the overall strategy and profitability objectives. This will ensure that resources are being used effectively for maintaining the company's core competence for today and also the future.

Less obvious than products are the organization's policies and procedures that apply crucial resources to non value adding activity. It is imperative that each individual -- those performing the activity and those who design and monitor the process and procedure -- continuously question whether or not the activity adds value and is necessary or whether it can be eliminated or improved. Again, it is important to keep in mind the core function of the organization and also the concept of internal customers and to see to what extent the activity of each person supports the core function and satisfies his/her internal customer.

Marketing, product managers specifically, need to be charged with more efficient product line maintenance and every functional leader needs to be held accountable for more effective operation. Although more difficult in some functions than others, it is possible to establish performance baselines as a reference against which improvements can be measured. Benchmarking is a tool finding widespread use in organizations wanting to improve any and all facets of their operation. Executives, managers and activity leaders can and should be held accountable for not only performing day-to-day activities but for improving whatever it is they are responsible for in a continuous effort to be "best of class".

K. Re-establishing an Intrepreneurial Culture and Structure

The renewing organization must be able to free its best performers for the challenges of innovation and be willing to devote financial resources accordingly. Success in innovation results when people of proven performance capacity are given direction, responsibility, deadlines and resources to get the job done. Those providing executive leadership must focus their vision on opportunity, must continuously receive feedback from others in the organization to spot such areas of opportunity and must allow those of intrepreneurial spirit to exploit such opportunity. [71]

The new intrepreneurial structure must eliminate isolation and separation and integrate segmented functions into cohesive centers of value added activity. The new structure must provide strong leadership and vehicles to identify opportunity, incentives and rewards for team formation and cooperation and information networks which support teamwork and communication. The more of the day-to-day organizational duties that can be entrusted to empowered people in activity focussed groups, the more time available for organizational leaders to seek opportunity and plan ways to exploit it. Also, the less segmented and functionally oriented this "executive support" group becomes the more synergy and idea sharing should take place -- all to better serve the organization as opposed to serving isolated function or individual. The more that people know of the organizational vision, the more that they understand of the core function and the more that they are empowered, the more opportunity will be identified at all levels of the organization and the more autonomy there will be in finding ways to make the organization efficient and effective. Cooperation flourishes on a foundation of common vision and shared experience. Focus must be on competence; more responsibility within the activity centers and a pulling together to achieve new opportunities. Empowering individuals within autonomous groups will unleash the power of innovation and create the first and most important step toward loosening the power of corporate hierarchy and the building an intrepreneurial organization. [72]

The fundamental purpose of the organization must be considered from a cross functional perspective. Individual thinking and initiative must be focussed on core functions, objectives and values.

L. Matrix versus Activity Centered Organizational Structure

In large, complex organizations a matrix management structure has been tried in an attempt to pull together people from various functional areas to focus on a common objective. While effective, matrix management is neither simple to implement nor fast in achieving results. A new structure must be implemented which achieves the benefits of a matrix yet is simple, easy and responsive. A key to having this happen is to form matrix like activity groups of competent individuals who have the autonomy to do whatever necessary to achieve desired results. [73]

Matrix structures were fashionable in the 1960's and 70's primarily in large, high technology industries. They were implemented in an attempt to coordinate diverse resources on large and complex projects. [74] In practice, the matrix structure was all but unmanageable; it resulted in a proliferation of committees and reports that tended to bog down the organization. The overlapping of responsibilities produced turf battles and a loss of accountability. [75] The activity groups, previously referred to and which will be described more fully in Section V, are matrix like only in that they consist of members from various functions and disciplines brought together to focus on a common activity or project. Such activity groups are much more autonomous, self directing, efficient and productive than any form of matrix structured groups.

Although the concept of activity centers could extend to each and every effort in the organization; as proposed, the officially recognized activity groups would be limited to major, value adding activities centered around the core functions of the organization and those key support tasks that enable the core function to be more efficient and effective. Specific examples of where activity oriented groups could most benefit a manufacturing organization would be in the manufacture of existing product and in the development of new products.

As previously mentioned, it is crucial that every individual understand the objective toward which their activity is directed and also the inter-relationship between functions. Only then will people be able to determine how their individual activity can best be performed and integrated with the activities of others within their function and also with the activities of those in other functions. With this knowledge and with the corresponding empowerment to make decisions and take action, individuals throughout the organization can work toward greater efficiency, effectiveness and overall competitiveness.

V. An Activity Centered Organizational Structure

A. The Need for a More Effective Arrangement

As previously indicated, the typical conventionally structured medium-sized manufacturing organization is too sluggish, too bureaucratic, and too unwieldy to be a world class competitor. The structure is not adequate; it is not compatible with the needs of todays knowledge worker; it is not responsive enough to todays customer; it does not utilize resources well and consequently the return on owners equity is less than it could be. Furthermore the typical manufacturing organization is not continuously improving and renewing to the extent needed to meet tomorrows organizational needs. As previously mentioned, the only true resource of an organization is its people. The key, then, is to align these human resources in such a way for them to overcome existing organizational ills and allow them to better satisfy the four organizational needs. In order to function more effectively the traditional organization needs to be rearranged into smaller, more autonomous, activity centers. These task oriented activity groups must either contain or have immediate access to all the other resources needed to make the decisions and to take the action as it needs to be taken; without delay and without the associated frustrations and wasted energy.

The information based organization of today differs radically from that which has preceded it. In the information based organization which contains a large percentage of knowledge workers, specific knowledge pertaining to the organizations core functions is contained in the minds of the specialists performing the real, core work of the organization. These people, having the knowledge of the work they are doing and a high degree of intelligence, could be much more self-directing given the guidance, support and opportunity to do so.

It must be the goal of the leaders of the organization, the CEO and the executive staff to effectively tap the resources of these knowledge workers -- to align these people into appropriate activity oriented groups, and to provide the direction and support needed for them to turn the organizational vision into reality.

B. Autonomous, Task Oriented Activity Groups

An activity centered structure is comprised of groups of empowered task forces. These groups are assigned tasks critical to the success of the organization. These

groups would be made up of core team members who stay with an assigned project from start to finish. These core groups would be supported by project associates who are brought into the group from the functional support departments on an as needed basis.

New product development, lifeblood of the future for the manufacturing organization, can only be adequately accomplished in such an activity oriented environment. Conventional, sequential, functionally isolated new product development cannot be done fast enough nor result in a product good enough for todays market. The use of concurrent engineering techniques is a step in the right direction but is still inadequate without the supporting organizational structure.

Major limitations to total resource utilization exist in the conventionally structured organization:

- people not knowing the overall corporate objective
- people not realizing how their job function fits into and can influence these objectives
- the limitations and boundaries to an individuals authority in making decisions to achieve these objectives
- not having all the available information to effectively make decisions
- difficulty in communicating with others in the organization who would be instrumental in getting an activity accomplished.
- having to get the approval of those who feel they need to sanction what is being done before getting the decision implemented.

In the conventionally structured organization, there could be as much energy expended overcoming organizational barriers as is spent resolving the problem and implementing the solution. An activity oriented structure, with the key players all in immediate contact with one another and with direct and immediate access to resource and support people and having the necessary information and empowerment to make needed decisions, allows energies to be better focused on value added activity.

C. the Best of Both Autonomy and Hierarchy

An organization structured around activity centers could retain the benefits of the hierarchy and also those of the autonomous team. It would align people into efficient operating groups focussed on the crucial, core activities of the organization and by so

doing give individuals an opportunity for higher contribution, personal growth and development. It would also allow direction, coordination and "control" of the diverse activities of such groups within the organization -- a major attribute of the hierarchy. A total hierarchy-less, 100% peer equality organization is unrealistic. Such a situation would cause chaos, confusion and anarchy. People yearn not only for freedom of personal expression but also for order, organization, leadership and guidance.

Two very large and very successful companies, Hewlett-Packard and Bechtel are striving for greater focus via more centralized control and also greater customer responsiveness via autonomous business units. Their structures are one of multidisciplinary teams and multifaceted individuals operating within a structure which ties the various teams to the overall mission and focus of the organization. The basic, underlying premise of a structure of autonomous teams is an organization of greater productivity, efficiency and focus on objectives. Success of this type structure depends on how well this concurrency of effort is achieved. Concurrency of effort between the various groups will be determined by the degree of cohesiveness at the executive level and how well the corporate strategy has been defined and how clearly the group objectives and responsibilities have been communicated. Concurrency of effort within each activity group will be achieved to a large extent by the activity group leader. To be truly effective, this person needs to have a multi-functional orientation, know the technical as well as the business aspects of the activity and must have the required leadership skills. [76]

Concurrency of effort between members of the activity project team will occur when each knows the overall objective and what they as individual contributors are responsible for, when everyone has the resources they need, when all are empowered to make decisions and take action and when there is communication between individuals. Concurrency of effort between teams will be realized when various activity groups are linked together electronically all basing decisions on the same information and having access to associated results. [77]

D. Providing a Sense of Ownership

The psychological ownership individuals feel for their activity can give an organization a competitive edge. A situation where everyone involved in a particular activity feels a sense of responsibility for what is being done -- where people work as if

they owned the place will result in greater commitment, greater conscientiousness and a higher quality product. Each person needs to find meaning in their daily activity; they must be able to make some sense of the big picture -- how their activity can assist in a better organization and an improved society. Leaders of the organization both at the executive and team level, must provide this sense of worth -- they must reinforce the value of the individual; the fact that each person is needed to achieve something special and worth while. [78]

Small, autonomous, activity oriented groups are more likely to provide individuals with their need satisfiers than is a typical hierarchical structured environment. If implemented correctly, these groups will provide a greater sense of belonging yet still allow more latitude for input on decisions and career directions. These small groups should provide not only more meaningful work but also greater satisfaction from being able to see the relationship between effort and results. From an organizational perspective, small groups allow individuals to better see the relationship between contribution and customer satisfaction; an individuals "customers" within the group, within the organization and also the real external customers. In like manner, small groups allow a better view of the relationship between individual, group and organizational needs as well as the needs of the organizations shareholders. The segmented nature of most hierarchical structures does not allow these relationships to be adequately seen and felt by individual workers.

E. A Model of an Activity Centered Organizational Structure

The structure of the proposed activity centered organization would be as depicted in Figure 9. Key elements of this structure are the **leaders** who guide, support and focus the activity groups; the **activity groups** themselves; the **information** which binds all the activity groups together and the **support resources** which the activity groups draw on for specific knowledge. This model of the new organizational structure conveys a feeling of fluidity, dynamism, responsiveness and cohesiveness -- all which is lacking in both conventional organizational models and in the organizations themselves.

This new business structure consists of flexible management which is able to pursue new opportunity without being bogged down by cumbersome structures and weighty procedures that impede action. The new configuration motivates by providing

a clear vision of organizational goals and an environment conducive to individual contribution and recognition. It provides a balance of people skills and informational tools. It requires managers to possess more skills, both business and interpersonal; to understand the global arena, and to know how to make the organization more skilled and competent and align people towards those objectives. Such managers need to set the direction in which to go and allow the people to find the best way to get there. [79]

The new activity centered structure could best be described as a network organization. A network being a system of interconnected and cooperating groups and individuals. This network is a web of task focused groups with direct ties crisscrossing to other groups throughout the organization. Management would "float above" these groups, orchestrating them in the strategic organizational "symphony". Traditional departments would exist as orientation and focus centers for the functional specialists; specialists to be deployed to the various activity centers for project assignment. These functional departments would establish the mission of the particular function and the associated strategy and plans for best achieving the mission. They would provide the required training and skill enhancement for the individual specialists and maintain the necessary coordination and continuity between the efforts of the departments' members. The company's knowledge will reside with these functional specialist and it will be the department managers function to direct and focus these specialists towards the organization's objectives via participation in the various groups activities. [80]

F. The Executive Function

The activity oriented model of Figure 9 shows the CEO and the executive staff facilitators on the periphery of the organization. The inference being that they are very much in contact with the inner workings of the organization and also in direct contact with the external operating environment. As such they are in the best position to see and sense external forces and to decode these perceptions and translate them into proactionary strategies for the activity groups.

Figure 9 is an instantaneous snapshot of the organization. In operation, the CEO and executive "buffer" link could be seen as continuously revolving around this periphery while the shape of the boundary also continuously changes to accommodate the environment; to take advantage of opportunity and to deal with

threats. Dynamically, the model would not be unlike a living cell continuously adapting to its environment.

By being in continuous and direct contact with the cross functional activity groups, this executive buffer/support link would provide a cross fertilization of information and ideas between the various groups and staff support resources. No longer would vice-presidents remain functionally isolated within their individual domains; they would now be responsible and held accountable for working together as a team to provide the leadership and support for the rest of the organization. Such a scenario allows the CEO and all the executives to have easy access to the project groups; to keep aware of the local "climates" and to ensure conformance to group and organizational objectives. Such easy and open access also works the other way to allow communication from those within project or support groups to the executive staff and CEO without the filter effects associated with typical communication transfer.

Organizations must recognize individual talent and allow such individuals to achieve positions of leadership and power. The more that people are allowed to do this, the more forces there will be to drive the organization towards its objectives. Effective business leadership is the proper fusion of effort and human relations. Good ideas and working toward common organizational objectives generates enthusiasm, support and cohesion. Individual self esteem comes not merely from immersion in the team activities and of following the prescribed process but from recognizing and attacking problems, assuming responsibility and from doing good work. A continuous intertwining of executives with the activity groups will allow this to happen; isolation, segmentation, "class distinction" and associated politics will prevent this from happening. [81]

G. Support Resources

In a conventional organization the tendency is for staff functions to be somewhat obscure and staff personnel to be quite removed from the mainstream activity. It is perhaps for this reason and also due to the respective managers desire to enlarge his/her own "kingdom" that staff functions tend to grow far beyond that which the value of their contribution warrants. Support resource functions must develop an orientation of allegiance toward their "clients" or internal customers rather than their professional positions. These resource functions need to be "bottom line", financially motivated and

think of themselves as internal service business groups responsible for generating a profit based on the demand for their product and its value to their customers and their own operating efficiencies. Need for these support resources and worth of their services must be determined by the core activity groups they are supporting. [82]

To have an effective customer-supplier relationship, staff functions, i.e. support resources, must be in intimate contact with that activity which they support. The Figure 9 model depicts these resources in close and continuous contact with the various activity groups. Support personnel can be pulled into the activity group on an as needed basis. A more detailed model of activity centers focused toward both manufacturing and new product development tasks is shown in Figure 10. These models indicate the relationship between the activity centers core members and its project associates (support resources).

When "contracted out" to the activity group, the support specialists focus and priority must be meeting the objective of the group -- the customer. Any performance evaluation of the specialist during this period of time must be based on the degree of customer satisfaction -- how well did the support person fulfill the obligation to the group and its activity.

These functional support groups are really internal service businesses. It must be the responsibility of the functional manager to make sure his business is competitive by providing customer satisfaction and by operating cost effectively. Operating with such an orientation can help to keep organizational overhead/burden costs in line by providing greater value adding activity. It can also make the application and implementation of activity based costing easier by more readily identifying the cost drivers within the organization.

H. Computerized Organization and Information Access Tools for New Product Activity Groups

Second only to poor leadership, poor communication is a major reason for ineffective resource utilization. Having defective information, perceiving good information incorrectly or not having the necessary information results in a whole spectrum of organizational problems.

All organizations have limited resources and a virtually unlimited array of projects which could be pursued to benefit the organization. It is therefore necessary to pursue

projects on a priority basis. Information tools not only can help establish priorities but also allow communication of priorities to those needing the information. [83]

It is important for the activity group leader to organize, monitor and control the project using computerized project management software. The depth to which this tool is used would depend on the complexity of the project and the expertise of the person using it. This project management tool is used as a coordination and communication tool for those engaged in the activity and also for others in the organization. Through use of this medium the support function managers know the priority of projects being worked on and also the status so support people can be scheduled and assigned accordingly. Having this information networked also allows support department managers to compile their own project management schedules which were linked together with those of the activity groups. Changes to the master project schedule could be viewed immediately by the various support managers and support schedules changed accordingly. In similar, but reverse fashion, if there were an impending shortage of support people based on the various project schedules, the activity team leader could make the necessary adjustments to the project schedules. Having and using an effective project management and resource allocation system assists an organization in maintaining an optimum number of support people and effectively utilizing those engaged in various activities.

Management control of activities in a traditional hierarchal organization is exerted through the hierarchical networks as depicted on an organization chart. In an activity centered structure, linked with computerized networks, top management could monitor results at all levels without intermediaries and adjust activities accordingly. Through intelligent use of information systems it is possible for people who only work together infrequently to be equally as effective as a permanent group; e.g. a management team in a new venture company. Such information systems could consist of computer access to organizational history, product and process data and computer based expert and decision support systems. Also, with an appropriate method of locally collecting individual performance data; individual skill level, participation and contribution can be recorded and evaluated. This could allow a person to be more justly compensated based on his value adding performance in local activity group projects.[84]

I. Manufacturing Oriented Activity Groups

In an attempt to manufacture a higher quality product more efficiently, the more innovative manufacturing organizations are structuring their production areas around work cells comprised of empowered work teams. Essentially these are production oriented activity groups. These groups, or cells, are designed and laid out from end to start; determined by the "pull-through" or customer need principle. That is, each portion of the production cell is designed to best serve its internal customer -- the recipient of the product -- the result of the activity. The entire manufacturing cell can be organized and managed as a complete entity -- a totally integrated and autonomous activity group. [85]

It is the manufacturing process that adds the real value in a manufacturing organization. It is what pays for everything else; what ties all other activities together and what is the integrator around which all else must focus. Everyone in all other activity groups and all support functions must have this awareness; they must understand the basic concept of the manufacturing organization and the process by which their activity adds vale and contributes to the product and the overall success of the organization. [86]

VI. A Change Oriented Culture

A. A Culture of Innovation

To create an environment conducive for innovation, more complexity is essential; more relationships, more sources of information, more perspectives on the problem, more access to resources and more boundary crossing. Organizational leaders must establish the organizational structure and set the cultural tone which encourages people at all levels to strive for higher levels of innovative achievement. There are three ways organizations can encourage innovation and assist the spread and availability of power and leadership:

- establish open **communication systems**
- create an environment conducive to **network forming**
- **decentralize** resources.

People, not formal systems are the principle carriers of information. When it is in the best interest of those involved, and they are allowed the opportunity and power, people will find a way to contribute to solving organizational problems. The environment must be supportive of those who can make the biggest difference in the level of innovative activity.

Those organizations which either fail to see the need to change or fail in their attempt to change will fade and fall behind those who successfully do change. Many organizations might realize the need to change but are inhibited in their attempt to achieve it. As long as segmented structures and attitudes make the very idea of innovation run against the cultural grain, or make it unduly difficult to achieve, there will be tension between the desire for innovation and the blocking of it by the organizational barriers.

The successful organizations in the future will be, above all, flexible; with more "surface" area exposed to the environment and many sensing mechanisms to detect emerging changes. These "surface" areas consist of executive leaders close to both the environment and also the internal workings of the organization. Other "surface areas" consist of many empowered knowledge workers deployed in the various activity groups. The "surface area" of these groups comes in contact with other activity groups, executive management, internal and external customers. This allows individuals within these groups to understand organizational strategy, concepts and

processes. What this amounts to is more people in tune with more things that could impact the organization and also in tune with other people working towards a continuously changing and improving organization.

Some less entrepreneurial organizations try to force change by top down edict. Others think change can only come from outsiders. This type of attitude conveys the message that those within the organization are not capable of producing the required change -- an attitude completely contrary to employee empowerment. It is very typical for middle management at non-innovating companies to perceive executive management as not really wanting intrepreneurial innovation at the middle management level. The implied message being that those below the executive level should stay out of the change process unless given a specific assignment of carrying out an executive decision. The architecture of change requires a supporting foundation predicated on a culture of trust and empowerment; a foundation consisting of a competent executive level team providing required leadership for the organization and alignment of all people resources towards core function objectives and continuous improvement.

B. Empowered, Change Oriented People

The change masters are those people who move beyond the organizations established practice to form integrative environments that support innovation and encourage the building of coalitions and teams. Change masters support and implement visions and seize the correct moment in an organizations evolution when it is possible to reconstruct reality on the basis of accumulated innovations; to shape a more productive and successful future. Mastering change means having the right people in the right places at the right time. A localized, piecemeal, segmented approach to change is not enough to develop the innovations needed for organizational survival. [87] An entire organization structured around focussed yet innovating activity groups can achieve the type of change needed for a manufacturing organization to survive and prosper in todays turbulent and challenging environment.

Aside from knowing what is going on and also where and how; the executive group must be active contributors to the organization. These individuals need to be constantly enhancing their own worth and also the worth of those for whom they are directly responsible They need also to work closely with their peers in high level task

forces to identify threats and opportunities and to formulate and implement plans to best counter the threats and take advantage of the opportunities. In short, they cannot operate like many traditional upper executives in a hierarchical organization; isolated and overpaid, collecting compensation based on long past contribution. Modern organizations cannot afford this type of handicap.

C. A Culture of Contribution

Beneath the structure of the new organization there needs to be a culture predicated on active contribution and a compensation system based on such contributions. Everyone will be more visible, more interactive with others and less able to disguise non value added, non contributing activity. Whereas it was relatively easy in the past to hide in low profile staff and or upper management positions, the new structure will not provide for nor allow such non-value added existence.

In conventional organizations it was not uncommon to continue to be granted compensation and position increases beyond ones contribution capacity. The new system must provide some mechanism for suitable match up between organizational requirements and positions and also individual contribution and compensation. This will be particularly difficult, but not at all impossible, for those people who have reached and perhaps past their peak contribution level. Decreased contribution may come about due to physical limitations of age or energy level or knowledge and skill levels which have not kept pace with organizational need. Decreased contribution may also be due to a voluntary and conscientious decrease in output.

Opportunity involves the chance to assume more challenge and rewarding assignments that require a greater exercise of ones skills. Meaningful careers are produced by seeking and accepting opportunity and by completing tasks leading to increased success of the organization -- not by hierarchies. People may make long term commitments to employers but short term, day-to-day, commitments are more likely made to projects. The skill and willingness to be flexible and to continue learning are more important and more valuable than just long term company employment. A key requirement in an entrepreneurial environment is the ability to create a product of value. The associated benefit is the freedom, independence and control over tasks -- having more autonomy rather than a guarantee of automatic pay increases. The proposed activity oriented new structure gives power to the person

rather than the position. Greater power will reside with those who have demonstrated a higher level of decision making ability. Security will be derived from being marketable and employable within the organization and also external to it. Training and experience on challenging tasks and projects will be more important than seniority. Career objectives will be oriented toward acquiring the capital of individual reputation rather than achieving a hierarchal position. [88]

D. Matching Individual Skills to Organizational Requirement

There needs to be a major effort on the part of human resources management to allow individuals access to meaningful contribution. Specifically this means getting people out of a particular role once their contribution decreases below what is required for that roll. Key roles in the renewed organization are those of the activity leaders and executive staff "advisors" and support function "business mangers". When an individual's contribution no longer matches what is needed, that person needs to be re-assigned to some less critical position commensurate with contribution. This is truly a win-win situation. The organization wins because it continually has the most qualified people in a particular position. It also wins because it does not compensate people above and beyond that which they are worth to the organization. The organization wins in yet another way in that there is no empire building by individuals in an attempt to hide inadequacies. Individuals win because there is incentive to continuously upgrade skills, knowledge and worth -- to remain marketable either within or outside the organization. Individuals also win because of the satisfaction associated with meaningful contribution to the continued success of the organization and an equitable compensation for such contributions.

People can be moved out of key positions; from levels beyond their competence to levels more closely matching ability to contribution -- and compensation can and should be readjusted accordingly. The long term viability of the organization cannot withstand this double burden of over pay and under contribution. Enhancing individual skills to match the needs of the position or reassigning individuals to another position commensurate with existing skills is neither easy nor quick in a compassionate organization. In the situation where an individual was put into a position for which he/she was never suited, fast corrective action can and should be taken. In such a case it should be apparent to the individual, and for sure those

around him/her, that there is a mismatch. To allow the condition to continue is not only unjust but also detrimental to the organization. In a situation where an individual once had the skill necessary for the position but did not keep the skills current; a slower corrective approach can be taken -- either through a skill enhancement program or through a tactful, strategic reassignment. Organizations cannot afford to throw away valuable human resources -- people who still want to contribute and are willing to upgrade skills or accept other assignments. Nor can organizations be burdened with those individuals who are poorly matched to their position and are unwilling to enhance their worth and are unwilling to accept other assignments. These people do not have the best interests of the organization in mind and should be considered for dismissal.

E. An Intrepreneurial Orientation

The principles of intrepreneuring are the principles of more rapid innovation. To be effective an organization must focus its competitive energies on performance and contribution, not on politics. When the organization becomes large and/or poorly orchestrated and functions become territories to which people develop loyalties rather than to the purpose of the organization -- then a change is in order. Cross functional activity groups provide primary identity with the venture -- the value adding activity contributing to the accomplishment of organizational objectives. This type of structure still allows the secondary, fraternal type of identity with one's functional peers. The focus is on the needs of the venture and problems tend to be solved holistically. Matrix teams have not achieved this type of focus; people have kept loyalty with their own function and own supervisor and have had secondary identification with the project. A close association with the venture and with other members of the group has appeal to the inherent tribal impulses; something that is lost in large and/or ill defined group relationships. Intrepreneurs have a focus on the market and technology, not on politics. There is no better training than the experience derived from leading or participating in an internal business venture within the larger organization. In every meaningful way, intrepreneurial organizations are more effective than their conventional counterparts. The freedoms and rewards of a "traditional employee" are inadequate in this age of innovation and knowledge workers. The best way to better utilize human resources is to give people the opportunity to act. [89] Autonomous activity

groups provide efficiencies of scale, focus on objectives, improved communications and opportunity for individual growth and contribution the manufacturing organization needs for survival in future decades.

In the proposed structure there are more cross functional links at all levels; that of the primary worker; that of the project leader and that of the integrator/advisor. It is essential then that potential barriers and impediments to such links be identified and removed for this structure to function as intended. Restructuring causes feelings of uncertainty and insecurity; these feelings must be eliminated before there is commitment to a new program. Leadership must insure the proper balance of managing change in such a way to produce security and retain and strengthen bonds between individuals. If people are moved within or released from the organization there needs to be time and provision for the survivors to reflect upon the past and to mourn it. Then excitement for the future must be generated. That which remains after the restructuring must all be justified as producing value; that which cannot be so justified should have been eliminated.

There are those who believe restructuring can be done on a piecemeal basis; that is, to establish a new system or structure within or parallel to the old. The new structure would operate in a manner to get around the problems in the old. This is an inefficient and perhaps destructive method; it indicates a lack of commitment and also allows two sets of standards within one organization. [90]

F. Concepts, Culture and Structure Versus Tools

In the 1980's, companies of all sizes began to realize the need to improve both products and operations. There continues to be an ever increasing number of methods available to assist in such improvement. Such methods can be considered "tools" for improvement. For example; companies identifying an inordinate purchased part, work in process or finished goods inventory could adopt MRP or JIT programs to alleviate the situation. If getting new products out of engineering and into production is the problem; CE (concurrent engineering) practices could be tried. If new products have a history of being difficult to manufacture, DFMA (design for manufacturing assembly) techniques could be used. If repeatability of manufactured parts is a problem, SPC (statistical process control) methods can be put into practice. If new product development is consistently delayed due to incomplete or changing specs; if

the new product is not really what the customer wanted or if the new product over runs the target cost, QFD (quality function deployment) methodologies can be used. When upper management realizes the vast untapped potential in the underutilized work force, EI (employee involvement) programs are enacted to provide training and team orientation. And to make sure all things continue to get better, benchmarking and CI (continuous improvement) programs are developed. And of course, the be all and end all of all programs is that of TQM (total quality management) with its own myriad of activities, techniques and sub programs. Each of these programs, practices and methods is a separate, perhaps loosely interrelated tool used for organizational improvement.

There are probably some manufacturing organizations not involved in any of these programs, some perhaps have selectively chosen those that can have most impact and perhaps some trying them all, thinking that the more tools in use the more the situation will improve. The point that is being missed by many manufacturing organizations is that the programs previously mentioned are, in fact, merely tools. As good as these tools might be, if improperly used they could give minimum benefit or perhaps even result in a net loss. An average tool in the hands of skilled craftsman would probably produce better results than the best of tools in the hands of a novice. Also, a craftsman attempting to learn the use of one new tool at a time can achieve faster results than attempting to learning to use many new tools simultaneously. The underlying premise is that it is the craftsman behind the tool that will determine the results more so than the tool itself.

John Simmons is author of Working Together and an officer in the consulting firm of Participation Associates, Chicago. At a recent presentation of a local Association for Quality and Participation (AQP) meeting he cited the two major reasons organizations fail to achieve expected improvements from the programs they try:

- the **company leadership** is **not truly prepared** for the program **nor committed** to it
- **tools are tried first** before the proper organizational culture is present or perhaps tried in place of the proper culture.

Tools are not a substitute for skill and competence. The skill, the competence of an organization to use tools comes from the proper culture and the proper structure. A culture based on activities focussed toward enhancing core competence and

competitiveness at all levels of the organization and a structure which supports this culture provides the needed organizational skill. Once the organization has the proper skill then and only then can it achieve significant results by using various tools. An organizational structure of results oriented activity groups provides the foundation for use various tools to maximum advantage. New product development activity groups and production oriented activity groups as previously described, are examples how culture and structure must be changed before tools can be applied properly. A cohesive, integrated, multi functional new product development group will have team orientation and will be empowered and can efficiently and effectively use the tools of CE, DFMA and QFD. Similar manufacturing oriented groups can make the most of MRP, SPC, JIT and other production related tools. On a broader scope, TQM groups could take maximum advantage of benchmarking and continuous improvement technique tools.

Haphazard, indiscriminate and uncoordinated use of "quick fix" programs is not the answer to making the medium sized manufacturing organization more competitive. Nor does such an approach directly address the four basic needs of the organization. It is important that an organization's leaders have a deeper conceptual understanding of the organization: what it is, where it is in the evolutionary process, from where it has come, what is its purpose, where it needs to go and how it is to get there. These issues and part of the culture of an organization, form its supporting foundation and need to be considered when establishing the required structure. They are far more reaching and have much more impact than the various tools an organization uses to achieve its end.

G. Implementation of an Activity Group Structure

The specific details of the change process in an organization are dependent upon the unique characteristics and situation of the particular organization. It is beyond the scope of this paper to present or accommodate all the various scenarios; instead a general concept approach to the structuring of activity groups will be defined.

There are three basic methods of achieving organizational change:

- **executive management** decides what is going to be done and also how and then leads and coordinates the process

- hire **external consultants** to determine the what and the how and to direct the process
- executive management establishes the overall objectives and empowers **competent employees** to achieve the desired results

The core competence of a manufacturing organization -- the two processes around which all activity is centered -- is the manufacture of todays products and the design and development of those for tomorrow. These two activities are the essence of the organizations vitality and viability; one short and one long term. It stands to reason, then, that this is where the process of change should begin. These are the two activities around which cohesive, integrated, results oriented, multi-functional activity groups need to be established.

Activity group orientation entails a change to the processes of manufacturing and new product development from those which existed in a mechanistic, hierarchical structure. Implementing the production oriented and product development activity groups -- the creation of a new process -- should not be unlike the creation of the new product itself. In either case, new product or new process, the objective is to embody something which does not previously exist. The phases in which this new process -- activity groups orientation -- is embodied are:

- **Concept** phase -- written analysis of present problems and a written specification of the objective of the new process: what attributes the activity group must posses to remedy existing problems.
- **Development** phase -- detailing and designing the activity group: how it will operate, who it will involve, identification of roles and responsibilities -- essentially everything required to have the new process achieve its objective, committed to document form.
- **Implementation** phase -- putting together the various parts and pieces of the new design to see how well it achieves its intended function; not unlike the prototyping of a new product design. After initial implementation, the new process must be continually monitored and adjusted, continually improved for maximum effectiveness.

Regardless of which of the three previously mentioned approaches is taken, there is one common element necessary for success -- a change leading champion. In the case of executive directed and led change, this person could very well be one of the

executive staff members. A hired consultant could also fill this role. In keeping with the theme of employee empowerment, probably the best approach is to allow those closet to the activity to be responsible and accountable for the required changes. In this situation, the champion could be a middle manager; perhaps a production supervisor in the case of the manufacturing groups or an engineering department manager in the case of the new product development groups. Such a champion would have authority to recruit people as needed to accomplish the objectives and be accountable to upper management.

The case study of Company X in Appendix C details one company's attempts at and results of all three methods of implementing autonomous activity centers.

VII. Potential Barriers to Restructuring

A. Owner Support

Because restructuring could have massive traumatic effects on the organization it cannot be attempted without the acceptance, commitment and support of the owners. If it is the owners who are first to recognize the need to restructure then the necessary support could be automatic. If an owner is also the active CEO, all the better for this is the person who needs to be the ongoing supporter of the restructuring effort. It is possible, however, not to get the owner support initially or perhaps ever. Reasons for not getting owner support of restructuring might be lack of conviction of need to do so; fear of the unknown which accompanies change; concern over perceived loss of control; fear of being too successful or basic aversion to risk which any change brings.

If an organization collects any kind of meaningful data at all, it should not be difficult to find enough indication of a need to change. Performance indicators alone, such as sales volume or market share might not be relevant. Productivity or efficiency indicators are more meaningful -- showing how well objectives are being met and how well resources are being used. Customer satisfaction indicators can determine to what extent the company's products are meeting market needs and attitude surveys can show to what extent individual employee needs are being satisfied. Financial ratios such as return on sales or return on equity can determine how efficiently capital is being utilized and to what extent owner wealth is being increased.

Effectiveness of human resource utilization is perhaps more difficult to assess. Direct labor productivity is relatively easy to measure but this alone would be grossly misleading. When most of todays manufacturing organizations were established, the percentage of direct labor cost in a product might have been 40-70%. Today, in the same organization, the amount of direct labor cost in a product might be less than 10%. It is therefore much more important to determine how efficiently the overhead or burden portion of product costs are being utilized. How efficient are the support functions. How well are the knowledge workers being utilized. Removing hierarchical impediments -- reducing the friction between the engine parts will enable greater efficiencies and will allow the organization to do more with less. Probably the greatest barrier to owner support of restructuring is the lack of understanding of the new work

force; the potential they have to add value to the organization's activities and how a hierarchical, mechanistic and segmenting structure hinders them in doing so.

Even if internal data is insufficient to convince owners of a need to change, there are abundant examples of organizations having achieved outstanding success through restructuring and refocusing. GE Canada, Du Pont Fibers and Johnsonville Foods, to name a few, are well documented. CEO's from these organizations have not been hesitant to extol the virtues of restructuring within their respective organizations. It would not be difficult to get first hand evidence of the benefit from changing from a restrictive, inefficient hierarchical structure and culture to one of empowerment and achievement. Evidence of the need for change is abundant and should be convincing to anyone receptive to it.

B. CEO Leadership and Support

The CEO, regardless of whether or not he is also the owner, is the one person who can most directly enhance or hinder the restructuring effort. To have the process go well, the CEO must provide the leadership, the support and the sustenance throughout the period of transition and beyond. The CEO must either be the champion of the cause or give total support to whoever is. Just as this person provides the guidance and direction in normal day-to-day activities, so too must this person provide these things for the restructuring activities. The restructuring process will be either severely impeded or impossible with weak leadership in this position.

Renewing organizations need leaders with a transforming rather than transactional mode of operation. Such leaders must be the ones to keep the path clear for those actively involved in the details of the restructuring effort. The human aspect of this position is the most important challenge. It is the job of the CEO is to accomplish valuable work through the cooperative efforts of individuals. [91] Political infighting which might hamper the effort cannot be tolerated. The major impediment to renewal is politics played at the highest levels; when there is a low level of teamwork and no general sense of direction; when it is difficult to accomplish the obvious; when upper management simply does not get along with one another. It is the job of the CEO to set the tone at the top in order for the rest of the organization to follow. [92]

It is easier for a CEO new to the organization to accomplish this than one who has been with the organization for some time. An existing CEO probably has many

friendships and personal alliances with those in the executive rank -- relationships which might preclude taking the necessary tough action at this level to insure teamwork, cooperation and coordinating of activities at other levels. It would not be unlikely that some people in the executive level were actually influential or directly responsible for the CEO being where he is. A new CEO has no such allegiance or debts; he is more free to take whatever action is necessary -- to the point of removing, replacing or repositioning executives who are unwilling to do what must be done to support the restructuring effort.

C. Executive Staff Skills and Team Orientation

Regardless of how committed the owner and CEO is to the task of restructuring, they will not be the ones planning and implementing the actual activities. The major task forces will be led, or at a minimum, enabled by members of the executive staff. This is where much of the organizational information was clustered in the hierarchical structure. These then, are the people who must now use this information, along with the experience their positions should have bestowed, to assist others in restructuring. During the transition from hierarchical to activity centered structure, these people should comprise the steering committee to guide the task forces to get the restructuring accomplished. In the typical manufacturing organization, however, there might not be enough of the right kind of people to form the required steering function. After a thirty or forty year career with a hierarchical mind set; after using and benefiting from the hierarchical structure to achieve executive position and associated benefits, it could be difficult to convince many executives that the hierarchy is not the best structure. Having been isolated in their position for so long, it is doubtful that these people truly relate to the needs and motivations of knowledge workers. Never having been directly involved with information dispersing technology, it is unlikely that they will ever start using it or promoting its use.

Getting the executive level individuals to recognize what is best for the organization beyond their own personal interests; getting them to work together as a team for perhaps the first time ever; getting them to understand the basic concept for the new structure; providing them with the necessary skills to carry out their roles as steering committee members and getting them to truly support the restructuring effort and have

them genuinely want it to succeed - this could very well be the biggest hurdle to overcome.

D. Middle Management Competence

Whereas the existing executive staff needs to form the steering committee for the restructuring effort, the existing middle managers need to become the local task force leaders. Essentially the same impediments at the executive level could exist at the middle management level -- acceptance and support of the program and competence to carry it out. People at this level should, however, be much easier to deal with. For one, the players have inherently weaker "power bases", by the very nature of their positions. They typically are not as old as those in the executive ranks and consequently might be not as hierarchal oriented. They also might not feel as threatened by the impending change and more eager to embrace it and champion it. More significantly however, middle managers by their very positions may have a cleaner view of operations than their executive counterparts. Being more in the middle of the organizational spectrum they should be better able to see both ends. The important element is that the vision of the new organization be clearly communicated by the CEO/executive group to the middle managers and also their role and responsibilities for achieving the vision.

Earlier it was suggested that there are four basic types of individuals at any particular level in an organization. Two types of middle managers could be very instrumental in coordinating the change related activities restructuring would entail: those who had always been aware and part of what was going on in the organization and those who were also aware but perhaps had not previously had the courage and conviction to get involved. Those in the first category probably have the desired leadership traits and skills but were limited in a restrictive hierarchy in what they could achieve. Those in the second category might not have the same degree of initiative taking leadership characteristics but could still be very capable of organizing and implementing the restructuring plan. Both types of middle managers, working together and being guided and supported by the executive staff from the driving force behind any such organizational change.

E. Supervisors

The closer the restructuring activity gets to the real work areas, the less problems there should be in the form of resistance. In the traditional, hierarchically structured manufacturing organization, however, the position of line supervisor has tended to be a problem. This is the "boss" to the manufacturing people, those actually performing the direct labor, actually producing the product which the organization depends on for its existence. Line supervisors have typically been appointed with a "magic wand" approach not unlike how middle managers were created. Because these supervisors have had direct authority over those doing the organization's only real work, the effect of this approach has been even more devastating. That is, their lack of people skills and leadership competence has had a stifling effect on those who can provide the most input for improvement. Before the real potential of worker improvement can be unleashed at the core function level, the situation with line supervisors must be dealt with. These individuals, just like those in other managerial positions must be identified as either having the capacity to function in a coach-mentor-consultant role and be trained accordingly or they must be moved to another area of responsibility.

F. Individual Worker Training and Empowerment

In all functions, whether direct labor, or support, those doing the real work should offer the least barrier to achieving transformation. For those doing the real work the problem will not be one of acceptance of the new structure but more of training and orientation. Typically, it is not a matter of getting the cooperation of the workers but of providing the environment for them to do so. An employee having worked for a dictatorial, command and control supervisor for a long period of time might have a difficult time making the transition to a situation where his/her ideas are encouraged and implemented. Because the essence of the activity centered structure is one of cooperative effort and information sharing; skills in team work, communication and interpersonal relationships must be enhanced. Not everyone is equally receptive to, comfortable with, and good at working in groups versus working alone. These differences must be recognized and provisions made to allow such differences to exist within the new structure.

As described earlier and indicated in Figure 10 and 11, the various activity centers consist of both core team members and project associates. The core team forms the

nucleus of the activity; these individuals need to be the most team oriented and have the highest degree of interpersonal skills. Of no less importance to the activity are the project associates who supply much of the technical knowledge and skills. More individuality and solo performance can be tolerated in these roles -- a good place for those with the needed technical skills but lacking in the characteristics to be a core team members.

G. Physical, Facility Impediments

For activity oriented groups to perform optimally, the people involved should be physically close to one another. Not only is communication enhanced but so too is the sense of belonging and commitment. There is also a synergy that develops in close group interaction not possible when people function in isolation. Getting an activity group physically together can be difficult for an organization structured around functions versus activities. In a traditional manufacturing organization, even the activities involved in the creation of the core product tend to be scattered throughout the facility. Just as the support functions of marketing, engineering and finance are compartmentalized in their own areas of specialty, so too have the manufacturing processes been segmented. As manufacturing operations grew and evolved it was thought to be most efficient to group similar manufacturing processes together in special areas, away from where the final product assembly actually takes place. For example, steel might be cut and punched in one area, formed in another, machined in another, joined together in another and painted in yet another area before finally being delivered to the assembly line or area to be installed in the product.[93]

In the last decade or two the trend has been away from this concept towards the cellular approach to manufacturing. This not only eliminates most of the non value added activities involved in material handling but also puts internal suppliers and customers in close contact with one another. In this way whatever material an individual needs to do his job properly is readily apparent to the person who supplies that product. Also, any defects in the product can be instantly determined by the customer and corrected by the supplier. When this concept is extended beyond the manufacturing function to include major support functions, a complete customer/ supplier environment exists as depicted in Figure 8. It is disruptive, traumatic and

costly but manufacturing/assembly processes and support functions can and are being arranged around activities or products rather than around functions. [94]

Because manufacturing is the core function of the organization under discussion and because manufacturing has the greatest amount of physical items to configure, manufacturing should be given highest priority when attempting to physically configure an activity centered organization. Of the three major functions, engineering typically has the second most amount of physical items to be configured. There have been attempts to integrate the design and development function within the actual manufacturing area they support. Depending upon the nature of the product this may or may not be possible. Where sophisticated instrumentation is needed for new product development or where specially constructed test areas are required, this would be difficult. With different product lines there is usually a sharing of instrumentation and test facilities within an engineering function. In most instances it would not be feasible to duplicate these facilities within each manufacturing area or for each line of product. Wherever possible, however, keeping the engineering function physically close to the manufacturing area it supports is always preferable. It is, however, possible to have co-habitation of the new product development activity groups. This allows an efficient and effective product development in conjunction with the manufacturing processes.

It would seem unlikely that any existing facility would be conducive to the optimum physical layout, and would be equally unlikely for an organization to commit to a complete new facility to test out a new structural prototype. It is up to the particular organization to work within the constraints of the existing facility while using the linking power of a modern computerized information system to configure as optimum a layout as possible.

H. Communication Barriers

People are really the only significant resource of the organization. Aligning the activities of people with the objectives of the organization and linking people together via effective communication directly affects the success of the organization. How well the people are linked together will determine how effectively their activities are combined to achieve the goals of the organization. Communication links are even more important than physical links in carrying out group activities. It is important that

individuals be trained in interpersonal communication skills and their communication ability enhanced by having access to electronic communication tools. Communication is an individual responsibility. People communicate one at a time and each must do so for themselves. Many things can be delegated but direct communication cannot. Individuals can attend communication enhancement seminars but each employee must be held individually accountable for communicating effectively. Group leaders must continuously stress the need for and assist others within their group in achieving more effective communication.

Effective communication is work; it takes extra effort to make sure thoughts are accurately transmitted. As in everything else, the campaign for more effective organizational wide communication begins at the executive level, where in fact, accurate communication is most important and poor communication can have the most disastrous results.

I. Compensation Policy

A hierarchal type, seniority based system of compensation is not adequate for an activity based organization. Hierarchal based compensation rewards the relatively few who, for whatever reason, ascend to the apex of the function or the organization. Activity oriented organizations must reward contribution toward meeting the needs of the organization. What gets rewarded gets done. If climbing the corporate ladder, regardless of worth to the organization, gets rewarded then that is what people will strive for. If however, value added individual and team effort gets rewarded then that is what will get accomplished.

Innovative companies invest in people; they allow freedom to innovate, provide support in the form of a culture of pride and compensation based on contribution and worth to the organization. There are many compensation plans which are predicated on contribution versus tenure. A plan which factors in various aspects of individual and organizational performance might consist of the following:

- a **base amount** dependent upon the financial condition of the organization
- a component based on **individual merit** and perhaps one based on **group contribution**
- activity center **gain sharing**

- overall company **profit sharing**
- one-shot **bonuses**

Some type of incentive based pay is the only sensible reward system in the modern organization; it lowers the fixed liability and provides a higher variable based on contribution and/or worth. It is also a means to balance ones desire to excel on an individual basis with group performance.

Not only does the criterion for compensation need to be changed but so too does the method. In a conventional pay system, if value to the organization is recognized, it may get rewarded by an increase in base pay or salary. This increase typically is permanent and stays in effect after that for which it was awarded has past. Sporadic performers will continue to reap the rewards of the increase regardless of their present and future level of contribution. Consistently high contributions could be eligible for rewards each year but each years increase is actually amplified by that which was received in the past. This system of rewards is responsible for pay escalations beyond performance levels. This also drains the available cash reserves and prevents those who are high contributors from receiving adequate compensation. This is where bonuses or other types of one time payouts are so attractive; they provide a single, large reward for that which was contributed.

There are those who argue a bonus system is difficult to implement and manage and has the potential to create more harm than benefit. This is true with anything new which deviates radically from that which it replaces. Enough world class manufacturing companies have a bonus system of compensation to indicate that it does in fact work toward that purpose for which it is intended. With the level of computerization available to most finance departments, administrating such a system is not that difficult and ROI to the organization for doing so should be great enough to justify the program.

J. General People Impediments

An organization is a group of people gathered together to perform some activity; to reach some objective which is possible only through combined effort which would not be possible with similar individual effort being performed in isolation. To achieve such objectives requires a facility, tools, equipment and capital. These things however do not constitute the organization - the people are the organization. As such, anything the

organization does or does not do, can or cannot do is due to the people. Any impediments to organizational change are entirely people impediments. Any limits to what the organization can achieve are solely those which people impose. It might not be easy overcoming or accommodating the basic characteristics of human nature but any great achievement requires a vision of the future, a plan to achieve the vision and leaders directing the activity of a group of individuals toward making the vision reality. Aside from the physical aspects of an organization; facility, tools, etc., the magnitude of accomplishment achieved by this accumulation of individuals will be largely determined by the leadership provided them. If the right people are in place in key positions in the organization, achieving change is just a matter of how bad it is desired.

VIII. A Change Sustaining Culture

A. Change as a Normal Mode of Operation

Change to a traditionally structured and cultured organization can be traumatic and disruptive. The type of change required from a hierarchically based organization to that of an activity based structure could very well be the greatest single change ever experienced. In order to have future change not be an ordeal but rather be a way of life, the very essence of the new structure and its associated culture must be one that welcomes change, embraces change and continuously seeks change for the future good of the organization. If what gets rewarded does in fact get done then the reward system must be centered around value added change. The visionaries, the mavericks, the innovators and the change masters must be encouraged via the reward system to continually question that which exists in search of something better. As stated by the late Mr. James F. Lincoln, founder of the Lincoln Electric Company, Cleveland, OH:

"The actual is limited, the possible is immense."

Organizational improving change is not something that can or should occur only periodically - it must happen continuously and the organizational culture must be such that it fosters and promotes such continuous change. Technology has allowed us to build adaptive products; those incorporating microprocessor based "intelligence" which can modify their mode of operation depending upon the circumstances of use. The human race has proved to be the most adaptive species ever to inhabit the earth. In the future we must use our adaptive nature along with the adaptive technology we have created to continuously modify the socioeconomic entity we call the organization to better meet the needs for which it exists.

B. Empowering Leadership

Success and future viability of the organization has never depended more on good leadership than it does now. To achieve the cultural and structural changes required of the conventional manufacturing organization, executives must go beyond being merely high level managers and assume such leadership responsibility. Leadership which must provide:

- a well defined and **communicated vision** toward which all activity is directed

- **security in change** which normally comes only from that which is stable and known
- **orchestration of change:** coordination and direction of local change activity such that it fits into the overall change strategy
- an **environment which stimulates** and induces people to contribute full potential towards goal achieving, value adding activity
- the **alignment of people**, position, competence and compensation which is in the best interest of the individual and the organization
- a **culture of cooperation**: integration of functions and individual activities
- the **coordinated use of enhancement "tools"** only after the proper structure and culture have been established
- a **refocus** of the organization on the reasons for its existence; the satisfaction of:
  - employee needs
  - customer needs
  - owner needs
  - organizational needs

C. The Ability to Survive

Todays employees, the only genuine and renewable resource, are more competent, more capable and have more potential than at any period in the evolution of the manufacturing organization. Leadership is the key ingredient needed to configure these individual resources into innovating, change initiating, continuously improving, integrated and cohesive value adding activity centers.

Such individual and group empowerment will transform the ordinary, conventional organization into one which is truly world class and one which stands the best chance of surviving and prospering in the turbulent environment of the 1990's and beyond.

IX. Financial Ramifications of Organizational Restructuring

A. Quantifying the Required Investment

Due to the impact restructuring can have on an organization; before it is attempted, a quantification of the effect should be estimated. Because the common measurement of business activity is money, the impact of restructuring must be stated in financial terms. Restructuring will take an investment of resources: people's time and capital expenditure. It will also result in a decrease in operating efficiency during the period of transition. Ultimately, it will provide some financial benefit to the organization brought about through efficiencies of operation. All these factors need to be quantified in monetary terms for comparison of investment to return.

B. Quantifying Returns Related to Existing Products

As previously stated in Section V, the logical place to begin restructuring of the manufacturing organization is in the area of existing product manufacture and in the development of new products. In a conventional production assembly area, the supervisor dictates the workers activity, and the speed of the conveyor dictates the work pace. The activity is repetitious, boring and relatively mindless. Such an environment results in low worker involvement, low job satisfaction and low product quality -- reflected in high scrap and reject rates and high quality costs. Cellular, autonomous, internal customer oriented manufacturing centers have the potential to improve the quality of work life and in so doing improve the respective products in the following ways:

- lower manufacturing related defects resulting in lower internal and external quality costs
- lower total direct manufacturing costs due to greater efficiency/productivity
- fewer non-value added tasks and greater efficiency of value-adding tasks; greater throughput; faster availability of product to customer.

All of these factors should have a positive influence on sales, competitiveness and profitability of the product line. Also, more efficiently and effectively structured production areas will allow time for manufacturing personnel to interface with engineering to resolve existing product design related problems and to contribute toward the design and development of new products.

C. Quantifying Returns Related to New Product Development

From the standpoint of new product development; a restructured organization which provides for multi-functional development teams to operate in concurrent fashion can benefit the organization the following ways:

- faster time-to-market with new product offerings
- higher product quality; greater reliability
- products which are easier, less costly to manufacture
- lower overall product cost
- lower new product development costs
- closer match of product to market needs.

Again, a better overall product, offered for sale at a competitive price with acceptable profit margins and available before the competition will have positive financial effects and provide strategic benefit to the organization.

D. Controlling the Restructuring Process and Related Costs

As previously stated in Section VI - G; changing to autonomous activity oriented groups in manufacturing and engineering is a process development project. As such, the project activities can be broken down into phases similar to those of a product development project. In each case, there must be the **conceptualizing**, the **development** and the **implementation** of something which presently does not exist. A realistic and relatively easy-to-use tool for planning, organizing, coordinating, managing and controlling such a project is a personal computer based **project management** program. Such a tool allows the restructuring project to be broken down into specific tasks; the tasks sequenced logically one to another; cost and time estimates assigned to the tasks, resources allocated and the necessary monitoring and analysis to be easily accomplished. The use of a project management program easily allows a project budget and time schedule to be set and will assist in keeping the project within budget and on schedule. The graphics available with a project management program can be an invaluable communication tool to those participating in or monitoring the progress and results of the project.

An example of an overall restructuring / revitalization plan as arranged using project management software and shown in PERT chart format is shown in Figure 11. This shows the corporate restructuring project divided into sub-projects with associated

review milestones. These sub-projects are further divided into individual tasks as indicated in Figures 11a and 11b. These individual tasks can be assigned budgeted costs, durations and resource allocations. The various sub-project budgets can then be complied from the individual task information and the total project budget and time schedule similarly established. Figure 11c shows a cash flow schedule for a hypothetical restructuring project. As the project progresses, actual cash flow can be entered into the schedule for comparison to budget amounts. Figure 11d shows the corporate revitalization sub-projects arranged in GANTT chart timeline form. Scheduled project reviews provide for periodic project assessment -- how it is proceeding with respect to the budget and time schedule -- and are convenient places to make corrections and/or revisions to the plan.

The use of project management and related computer software will not guarantee restructuring project cost overruns nor will it guarantee a positive return on investment. Used by competent people providing the proper insight and leadership, it will however, allow the project the greatest chance of success in achieving its intended objectives. As explained in section VI-F; project management is a tool, the resultant work will depend on the crafts-person who uses it.

E. Specific Examples of Restructuring Related Investments and Returns

To quantifiably demonstrate the potential effects of restructuring on a manufacturing organization, two scenarios will be presented. The first scenario will show the effect on profitability of an existing product when the associated production area is changed from a conventional structure (i. e. moving conveyor line) to an autonomous manufacturing activity center.

The second scenario will show the effect on profitability of a new product developed using two different processes; the first process being the sequential approach in which the contributing functions operate in relative isolation and pass the result of their effort along to the next function when their involvement is complete: marketing to engineering to manufacturing (the infamous over-the-wall approach). The second process in this scenario is the more enlightened concurrent development process in which a multi-functional development team (autonomous activity group) works toward the common objective of bringing the best product to market in the shortest possible time.

The product used as an example in the two scenarios will be the same -- a piece of electrical, industrial equipment.

F. Scenario Number One: Production Area Restructuring

A schedule for this local restructuring project, along with estimated investment costs, might look something like that depicted in Figure 12. Figure 13 shows this information along with cost/price data on the product manufactured in this area. This scenario indicates that the product initially generates a 14.86% gross profit margin and an after tax cash contribution of $215 per unit when manufactured using conventional techniques and computed using the standard company formula. This scenario indicates that ten months after start of the restructuring project, a change in the gross profit and cash contribution generated from this product can be seen. These amounts initially decrease due to the increase in direct labor cost associated with the initial learning / adaptation period. Internal quality costs begin increasing at this time also and are followed by a corresponding increase in external quality costs (warranty) beginning in month eleven. In month twelve internal quality then began to decrease followed by a corresponding decrease in external quality costs in month fifteen. Its assumed that the internal vendor / customer relationships along with increased concern for quality and local decision making and problem resolution is responsible for this change. In month twenty, the changes brought about by restructuring finally result in an increase in cash contribution brought about by decreases in direct labor and quality costs. Quality costs stabilize in month twenty-three and direct labor costs stabilize in month twenty-four.

Total investment in this project is $356,007 and the associated return over the next five years in increased after tax cash contribution is $2,789,263. The net present value of the return on investment, at a 12% cost of capital, is $1,379,841 as shown on page 5 of Table 6. The investment in the Manufacturing area #1 project and the resultant change in after tax cash contribution for the respective line of products is shown graphically in Figure 14.

G. Scenario Number Two: Product Development Investment and Returns New Product Development Using a Conventional Process

Two processes of new product development will now be presented along with the

resultant product's financial impact on the organization. The first process is a relatively conventional product development process which typically occurs in an environment of functional segmentation; where communication and inter-functional cooperation is difficult and not endorsed or promoted. Under these circumstances new product development tends to be relatively unplanned, uncoordinated and uncontrolled. The development effort selected for this example is that which resulted in the industrial piece of equipment previously presented in scenario #1. The product itself is real and the product costs are representative. Because the project times and costs were never recorded at time of development, the figures presented are educated estimates of actual times and costs.

Figure 15 shows the various phases of this new product development project and the investment schedule, along with the total manufactured cost of the resultant product and the associated sales volume and revenue. It can be seen that this product is introduced for sale in month 34 at an initial gross profit per machine of $244 and an after tax cash contribution of $187. After resolving the initial start-up efficiency and product quality problems, the total manufactured cost stabilizes at $1351 in month 42 for a gross profit per machine of $257 and an after tax cash contribution of $215. Total development expense is $844,400 and the associated after tax cash contribution over a six year product life is $14,082221. The net present value of the project, at a 12% cost of capital, is $6,273,447 as shown on page 7 of Figure 15. Figure 16 graphically shows the investment schedule along with the cumulative investment and the cumulative after tax cash contribution. The break even point of investment return is reached approximately 40 months after start of project.

H. New Product Development Using the New Process

As detailed in the case study in appendix C, Company X is struggling to remain competitive had has tried various methods of improving its new product development process as a means to do so. The company is presently developing a new line of product to replace one that presently exists. The existing product was used as an example in the previous two examples. The new product, now in the design phase of its development, is similar in function to the old. The difference in product from a customer's perspective is the additional value it will offer in features and ease-of-use. The difference in the product from the company's perspective is the increased

profitability due to early availability for sale; lower manufacturing costs, and lower quality costs, brought about by a better development process. The development schedule, investment schedule and estimated return has been established for this project and is shown in Figure 17.

The project is being coordinated by a project manager using project management techniques. There is a core team comprised of members from key functions and numerous project associates from virtually every company function. The project has been well planned before any design and development activity began and the entire project shows promise of being carried out in a much more orderly and controlled fashion than anything which has preceded it.

Figure 17 shows the development schedule, project costs, product costs and related revenues. It can be seen that the product is introduced for sale in month 24 at a gross margin of $434 and an after tax cash contribution of $241. Total project cost is estimated to be $1,296,203 and total after tax cash contribution through year 9 is expected to be $24,292,661. Net present value of this project, at a 12% cost of capital, is estimated to be $11,859,007 as shown on page 6 of Figure 17.

Figure 15 graphically shows the investment schedule and cumulative after tax cash contribution generated. Break-even point of investment and return is approximately month 29.

No two new product development projects are exactly the same; thereby making accurate comparisons to the results of the project process difficult. The two situations of scenario 2 are probably as close as any two development projects can be -- the original development done with one process in one environment and the re-design development done with another. Figure 19 summarizes the salient differences of results achieved.

The two comparisons were based on development project investment and related returns; no mention has yet been made of the investment needed to bring about the change of process between the first and second development projects. Rather than trying to estimate what it would take to bring about an organizational change to allow the second development process to occur, consider for a moment only the difference in net present value of the two projects -- $5,585,560. The question can then be asked; could not the organizational structure of a medium-sized manufacturing organization be changed sufficiently with an investment of $5.5 million to cause such an

improvement in the new product development process? Would this also not be an extremely good financial investment and shrewd strategic move?

I. Quantifiable Relationships Between Organizational Culture and Structure and Financial Performance

The scenarios just presented were based on actual product cost data. The financial data was estimated and though representative, it has yet to be verified. There have been, however, several in-depth studies performed which do, in fact, indicate a definite and quantifiable correlation between an organization's culture and structure and its financial performance.

A study conducted by Denison reveals such a correlation between structure and performance. [95] As part of this study, surveys were conducted on leading and lagging companies within given industries over a five year period. Those companies which had a better organization of work and better decision making practices had higher ROI's and returns on sales. (Figures 20 - 27.) Also, over the five year study period it appeared that the financial performance of the higher performing companies and that of the lower performing companies was diverging -- the better companies were getting better and getting better faster.

The organization of work index used in the Denison study is a composite of four survey items that reflect the degree to which work is sensibly organized, work methods are adapted to changing conditions, decisions are made at appropriate levels and the goals of the organization are perceived by individuals as clear and reasonable. The organization of work index was intended to capture the potential of an organization to efficiently reorganize and adapt to changes in its environment.

The decision making practices index used in this study is a two-item measure indicating the degree of involvement that individuals have in the decisions that affect them and the extent to which information is shared across levels of an organization in a way that brings the best information possible to decision makers.

According to Denison in summarizing the results of the survey: "a strong culture that encourages the participation and involvement of an organization's members appears to be one of its most important assets".

Another Study was Conducted by Kotter and Heskett which established a

correlation between "appropriate organizational culture" and financial performance. [96] According to Kotter and Heskett, "appropriate cultural fit" is when the values and practices of an organization fits the needs of its customers better than the alternatives offered by the competition. In comparing numerous companies in various industries there was found to be a definite difference in the degree of cultural fit between the higher performers and lower performers within a given industry; with the higher performers having a much more appropriate culture than their lower performing counterparts. Also, there was a direct correlation between appropriate cultural/environmental fit, emphasis on leadership, stakeholder satisfaction and net growth, ROI and stock price. A general summary of these findings is presented in Figure 28.

A graphical comparison showing the degree of cultural fit between the higher financial performers and the lower performers is presented in Figure 29. Comparisons of higher and lower performers within a given industry to specific financial indicators is shown graphically in Figures 30, 31 and 32.

J. Organizational Renewal versus Performance

The study by Kotter and Heskett also showed that no single culture is appropriate forever. Their study revealed companies which went from a very strong financial position to one which was very precarious because the culture was not adaptive to fit a changing environment. It was determined that the only formula for a long term, financially successful culture was one of adaptability.

Figure 33 is a comparison of companies which presently have appropriate cultures to those which have inappropriate cultures. The twelve appropriate cultured companies are the same as the higher performers indicated in Figure 28. The twenty companies with problem cultures were at one time as successful as the previously mentioned twelve; they did not, however adapt or renew themselves to best deal with changes in their environment. It was found that the management of these twenty companies was generally arrogant due to the success they had achieved; there was no attempt at continuous improvement; they were non-receptive to ideas coming from the outside; they tended not to value their stakeholders and they were hostile to values such as leadership and proponents of change.

In contrast, companies having appropriate and adaptive cultures had managers throughout the organization which provided leadership to initiate change and tactics whenever necessary to satisfy legitimate interests of all the stakeholder groups.

In a study done by Beer, Eisenstat and Spector; changes in financial performance as a result of an organizational renewing, and restructuring was demonstrated and recorded.[97] The results were recorded in a more general nature than the two studies previously indicated but one of the more financially specific improvements which was noted is summarized in Figure 34.

K. Conclusion

Studies have shown a definite correlation between organizational culture, structure and financial performance. Performance is enhanced in structures which organize functions and individuals in a manner to most efficiently and effectively accomplish the intended activity. Performance is also enhanced in cultures which stress leadership, stakeholder satisfaction and continuous change to better accommodate such stakeholder satisfaction. Studies have further shown that organizations which have restructured for the purpose of achieving greater stakeholder satisfaction have, in fact, improved their financial performance.

A detailed plan for any restructuring project must be formulated and an associated time schedule, cost budget and associated returns must be estimated before any activity begins. The use of project management tools by competent individuals can insure that the restructuring activity will remain in control and that the result will be similar to what was expected. There is ample proof that a properly planned and implemented restructuring and renewal of the organization is a sound financial investment.

X.Conclusion

The conventionally structured, medium-sized manufacturing organization can and must operate more effectively than it is today. Competitive pressure continuously demands a better product, supplied faster and at a lower relative price.

People inherently want to do a good job and are inclined to accomplish what is expected of them. Within the typical organization, people at all levels are seeking greater involvement and contribution. These same people are also experiencing high levels of frustration with the difficulty involved in getting done what needs to be done. The human resource of the typical manufacturing organization is presently grossly underutilized.

The solution is as obvious as the dilemma: allow the people to do what they really want to do and have the capacity to do -- make the organization more competitive by making it operate more effectively.

There are too many forces acting upon todays organization for only a few people, those at the top level, to deal effectively with. The organizations' only true resource -- its people -- must be better aligned and enabled to solve its' problems and accomplish its' objectives. This cannot happen with weak, short-sighted leadership within a dysfunctional hierarchical structure. Nor will it happen from the indiscriminate use of quick-fix programs. Rather it will require:

- strong, visionary leadership, knowledgeable of human and organizational theory, operating in a cohesive and supportive manner
- a re-focus on the core competence of the organization and the value adding support relationships
- a structure of multi-functional, autonomous, task oriented "business groups" organized around production and new product development requirements
- a culture of product and process innovation; individual growth and self actualization
- recognition and compensation for performance rather than position

By its very nature, the medium-sized manufacturing company is well suited for effective competition. Some, with proper leadership and an enabling structure, are presently competing in world-class fashion. The majority, however, without such elements in place, appear to be dismally short of achieving their true potential.

XI. Areas of Possible Future Study

A. Quantification of the differences in performance levels of public versus privately owned medium-size manufacturing organizations.

Performance levels could be based on the degree to which the organization satisfies the needs of its stakeholders:

- employees
- customers
- owners/shareholders
- the organization itself

B. Case studies of specific manufacturing organizations which have gone through or are undergoing the transformation from one of conventional structure to activity oriented structure.

C. Detailed cost/benefit analysis and implementation of a state-of-the-art, computerized, decentralized information system.

D. An analysis of profit oriented, internal service groups (staff functions).

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Appendix A

Tables 1 - 5

MECHANISTIC SYSTEMS	ORGANIC SYSTEMS
High emphasis is placed on sub-division of task and differentiation.	Low emphasis is placed on specialization or standardization except as they realistically contribute to overall tasks.
******	
Functional specialists are concerned with improving technical means of their tasks.	Emphasis is placed on special knowledge and experience and their contribution to overall tasks and goals.
******	
Supervisors at each hierarchical level seek to integrate and reconcile performance of functions reporting to them.	Individual task activities are continuously redefined through interaction with others.
******	
Rights, obligations, and technical methods of each functional position are precisely defined and assigned.	Responsibility and obligations are loosely defined; problems cannot be passed up, down, or laterally.
******	
Authority, control, and communication are legitimate and hierarchical in nature.	Commitment to the organization is broadly defined, not narrow and technical.
******	
It is assumed that the necessary knowledge for ultimate reconciliation of functions is at the top of the hierarchy.	Authority, control and communication are derived from common interests and needs and are not based strictly on contractual obligations.

MECHANISTIC/ORGANIC CHARACTERISTICS

Table 1 (1 of 2)

MECHANISTIC SYSTEMS	ORGANIC SYSTEMS
High levels of vertical interaction patterns exist between superior and subordinate.	Knowledge and competence are equally distributed throughout the hierarchy. Exact location is contingent on the nature of problem.
******	
Communication content emphasizes directions and orders.	High levels of lateral interaction patterns exist between participants: consultation instead of command.
******	
Loyalty to the organization and obedience to superiors is a condition of employment.	Communication content emphasizes information and advice.
******	
Prestige is attached to achievement of position in the organization (local).	Commitment to goals is more important than loyalty and obedience.
******	
	Prestige is attached to external technical and professional affiliations (cosmopolitan).

MECHANISTIC/ORGANIC CHARACTERISTICS

Table 1 (2 of 2)

Source: Burns & Stalker, The Management of Innovation (London, Tavistoch Publications, Ltd., 1961)

DATE	FEATURE	SIGNIFICANCE
1895 - 1905	differentiation between management and ownership	established management as separate function
1920 - 1925	differentiated policy making from operations activities	introduced command and control concept
1985 - 1990	organization of knowledge specialists	information base multi-functional activity centers

ORGANIZATIONAL CONCEPT AND STRUCTURAL EVOLUTION

Source: Drucker, Peter F.
The Coming of the New Organization
(HBR, Jan.-Feb., 1988, page 53)

Table 2

THEORY X	THEORY Y
Work is inherently distasteful to most people.	Work is as natural as play, if the conditions are favorable.
******	
Most people are not ambitious, have little desire for responsibility, and prefer to be directed.	Self-control is often indispensable in achieving organizational goals.
******	
Most people have little capacity for creativity in solving organizational problems.	The capacity for creativity in solving organizational problems is widely distributed in the population.
******	
Motivation occurs only at the physiological and safety levels.	Motivation occurs at the social, esteem, and self-actualization levels, as well as at the physiological and security levels.
******	
Most people must be closely controlled and often coerced to achieve organizational objectives.	People can be self-directed and creative at work if properly motivated.
******	

MC GREGOR'S THEORY X AND THEORY ASSUMPTIONS OF HUMAN NATURE

Source: Hersey & Blanchard, Managment of Organizational Behavior (New Jersey, Prentice-Hall, 1988)

Table 3

	Traditional Organization (1890's - 1920's)	Emerging Organization (1980's - 1990's)
Workers:	uneducated, unskilled,	educated, skilled, career employees
Tasks:	simple, physical	complex, intellectual
Technology:	mechanical	electronic, biological
Perspective:	mechanistic - cause and effect	organic - multiple, interacting cause and effect
Markets:	stable	fluid, dynamic
Employees:	sharp distinction between workers and managers	overlapping roles and responsibilities

ORGANIZATIONAL DESIGN FACTORS

Kanter, Rosabeth M., The Change Masters:
Innovations and Entrepreneurship in the American Corporation
(New York: Simon & Schuster, 1983)

Table 4

BUREAUCRACY	POST ENTREPRENEURIAL
position oriented-authority derived from rank	person oriented-authority derived from expertise and relationships
******	
repetition oriented - efficiency from doing the same things over	creation oriented - seeks innovation and efficiency
******	
rules oriented - defines procedures and rewards adherence	results oriented - rewards outcomes
******	
compensates for status - pay is position based	compensates for contribution - pay is for value
******	
operates through formal structures - information is channeled and restricted	creates opportunities through expansion, transfer and availability of information
******	
sets boundaries; restricts action	sets guidelines - allow for decision making at all levels
******	
seeks ownership and control	seeks leverage and freedom to experiment

CHARACTERISTICS OF BUREAUCRATIC VS. POST ENTREPRENEURIAL CULTURES

Kanter, Rosabeth, M.
When Giants Learn to Dance
(New York: Simon & Schuster, 1989

Table 5

Appendix B

Figures 1 - 34

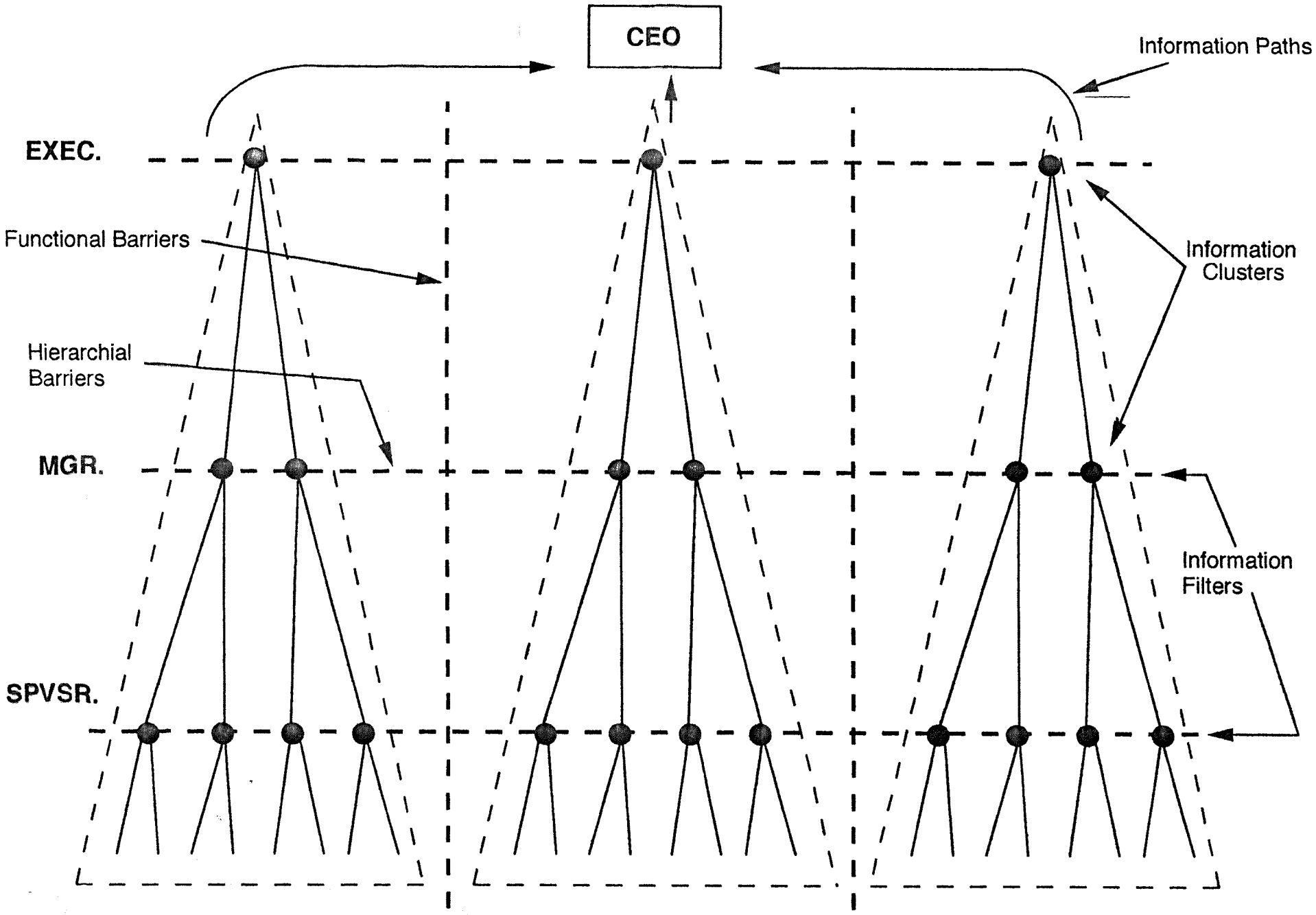
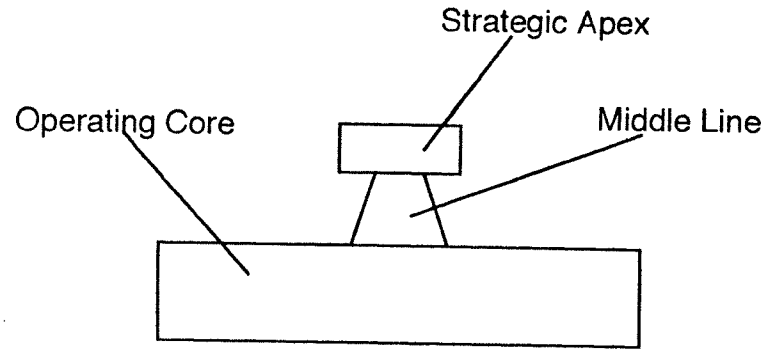
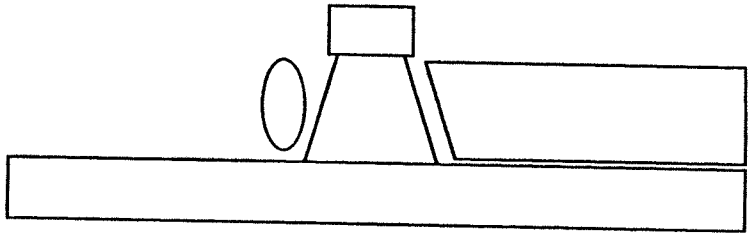


Fig. 1

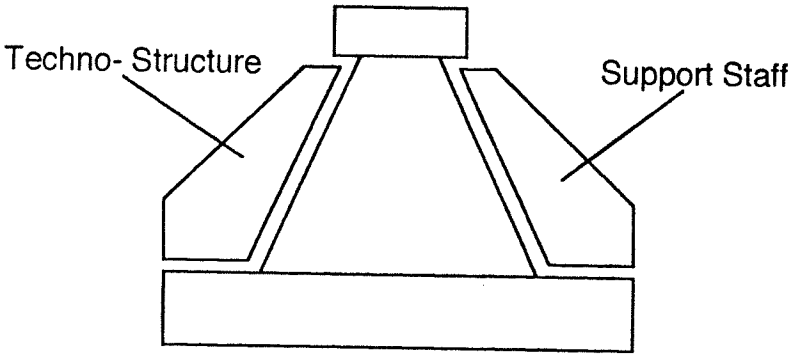
Organizational Segmentation



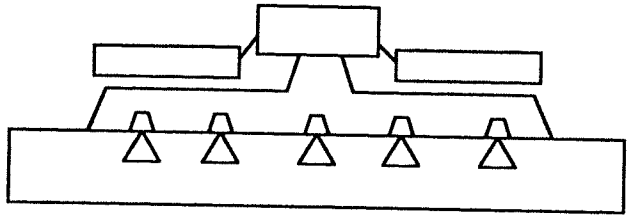
Simple Structure



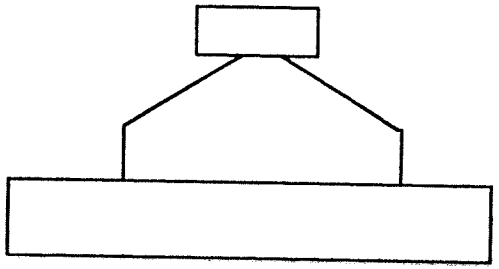
Professional Bureaucracy



Machine Bureaucracy



Divisionalized Form

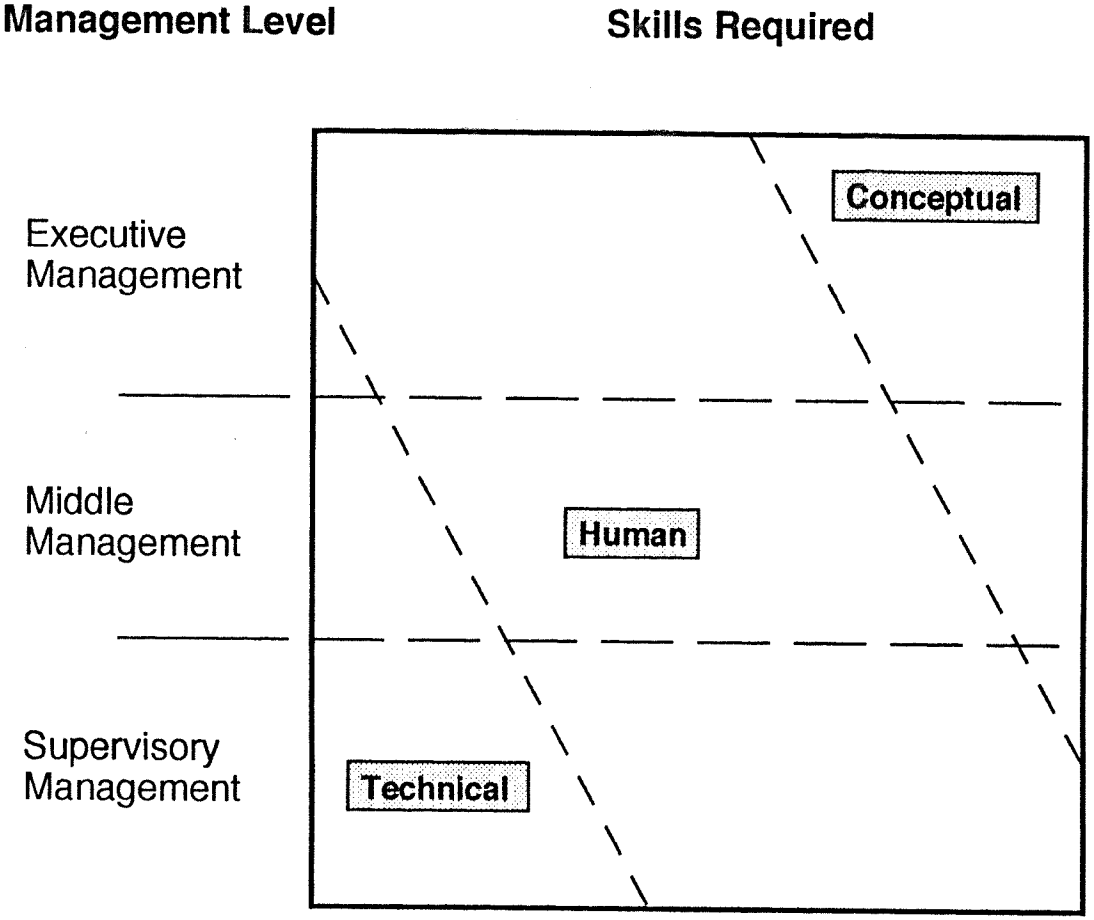


Adhocracy

Structural Configurations

Fig. 2

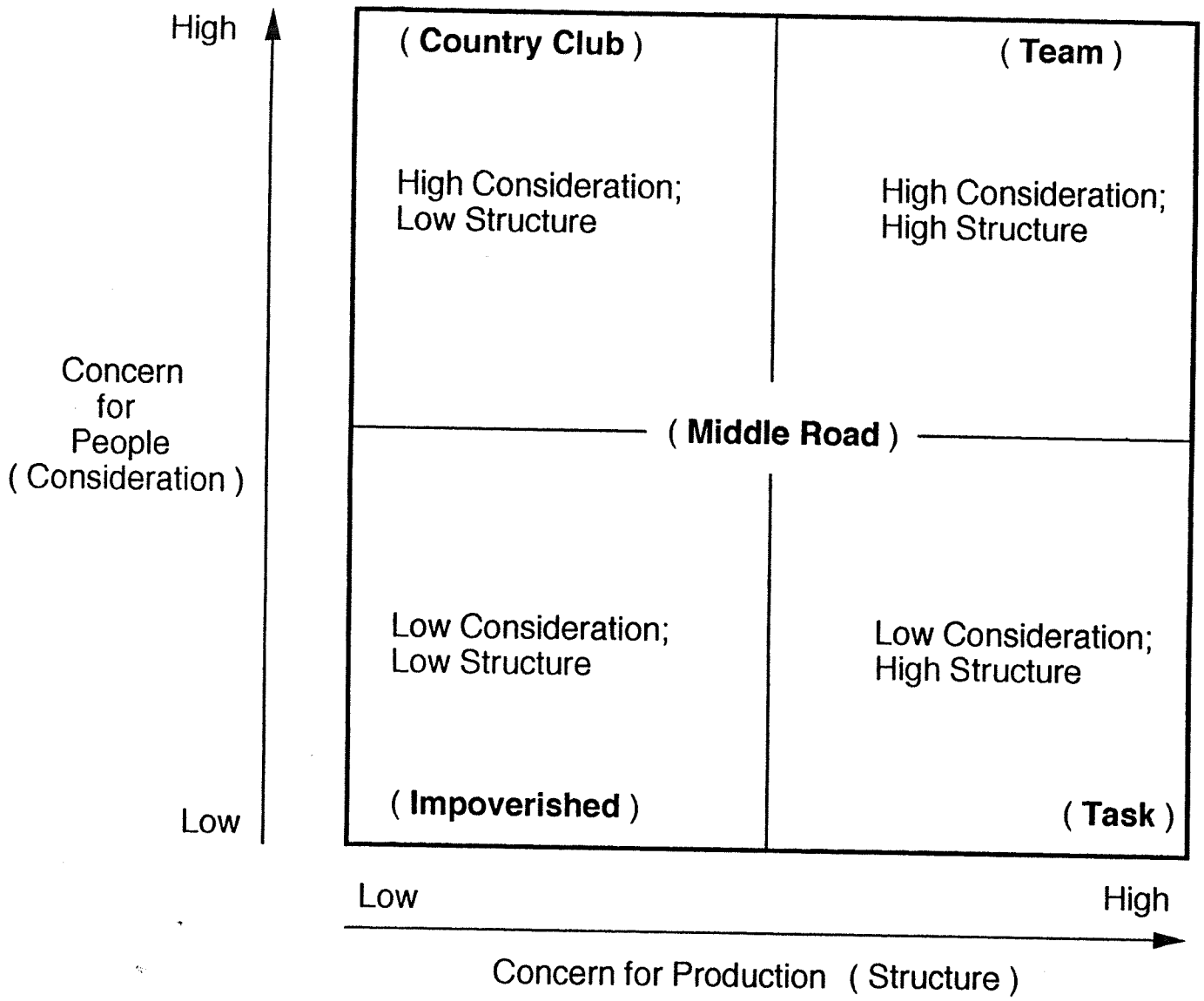
Source: Mintzberg, Organizational Design; Fashion or Fit?
(Harvard Business Review, Vol.59, p. 106, 1981)



Management Levels; Management Skills

Fig. 3

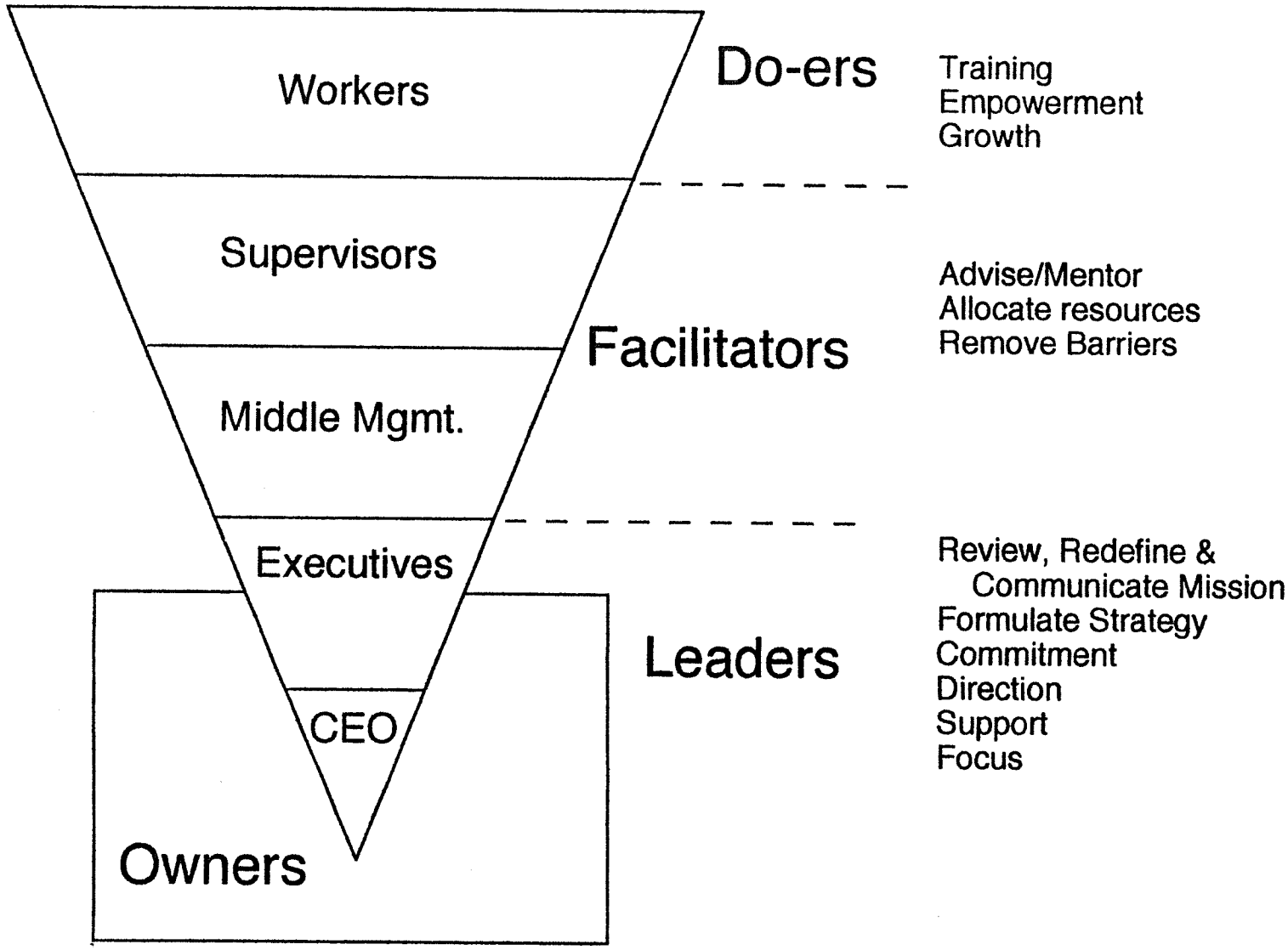
Source: Hersey & Blanchard, Management of Organizational Behavior
(New Jersey, Prentice-Hall, 1988)



Managerial Grid

Fig. 4

Source: Hersey & Blanchard, Management of Organizational Behavior
(New Jersey, Prentice-Hall, 1988)



Organizational Support Structure

Fig. 5

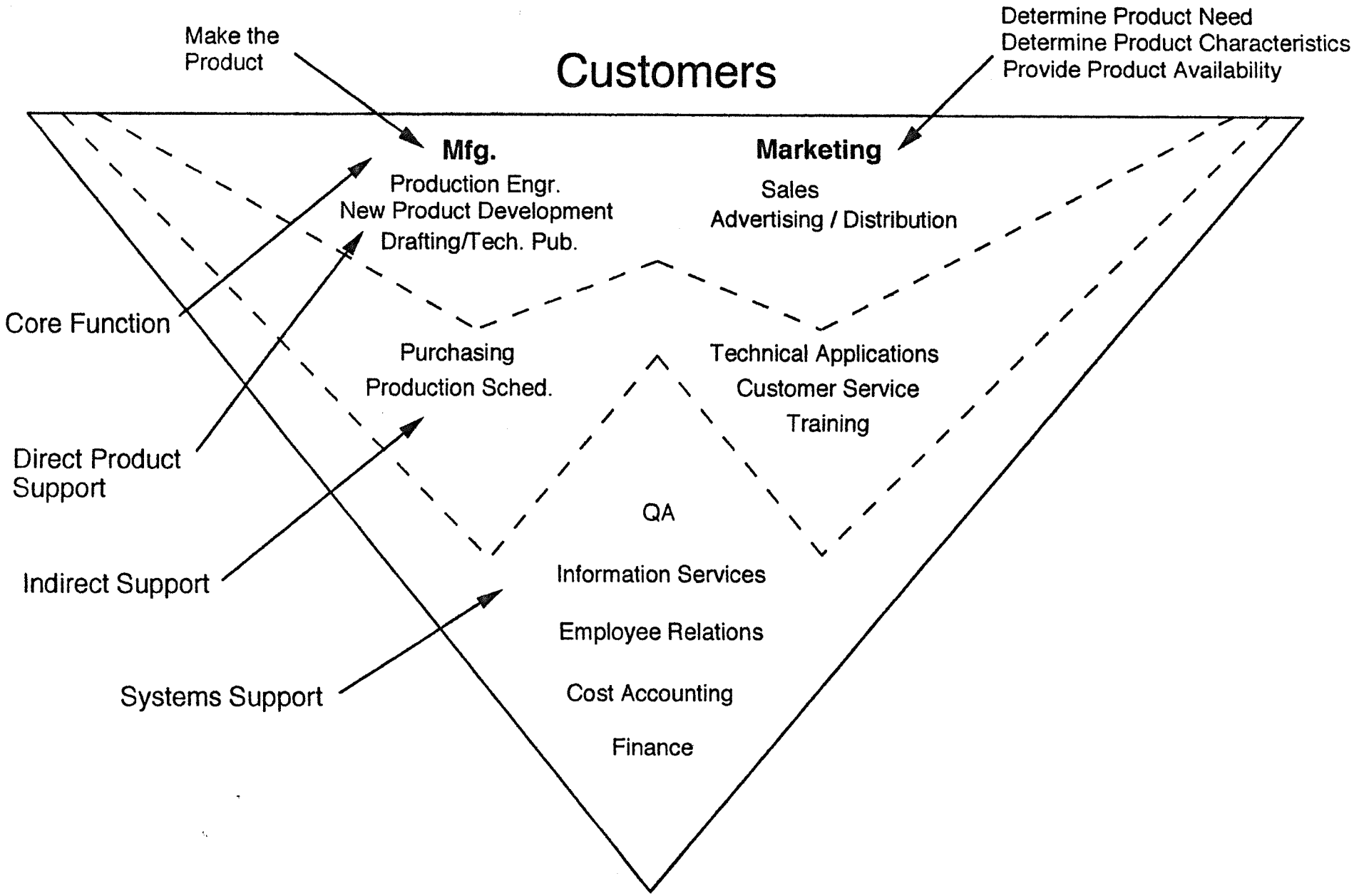
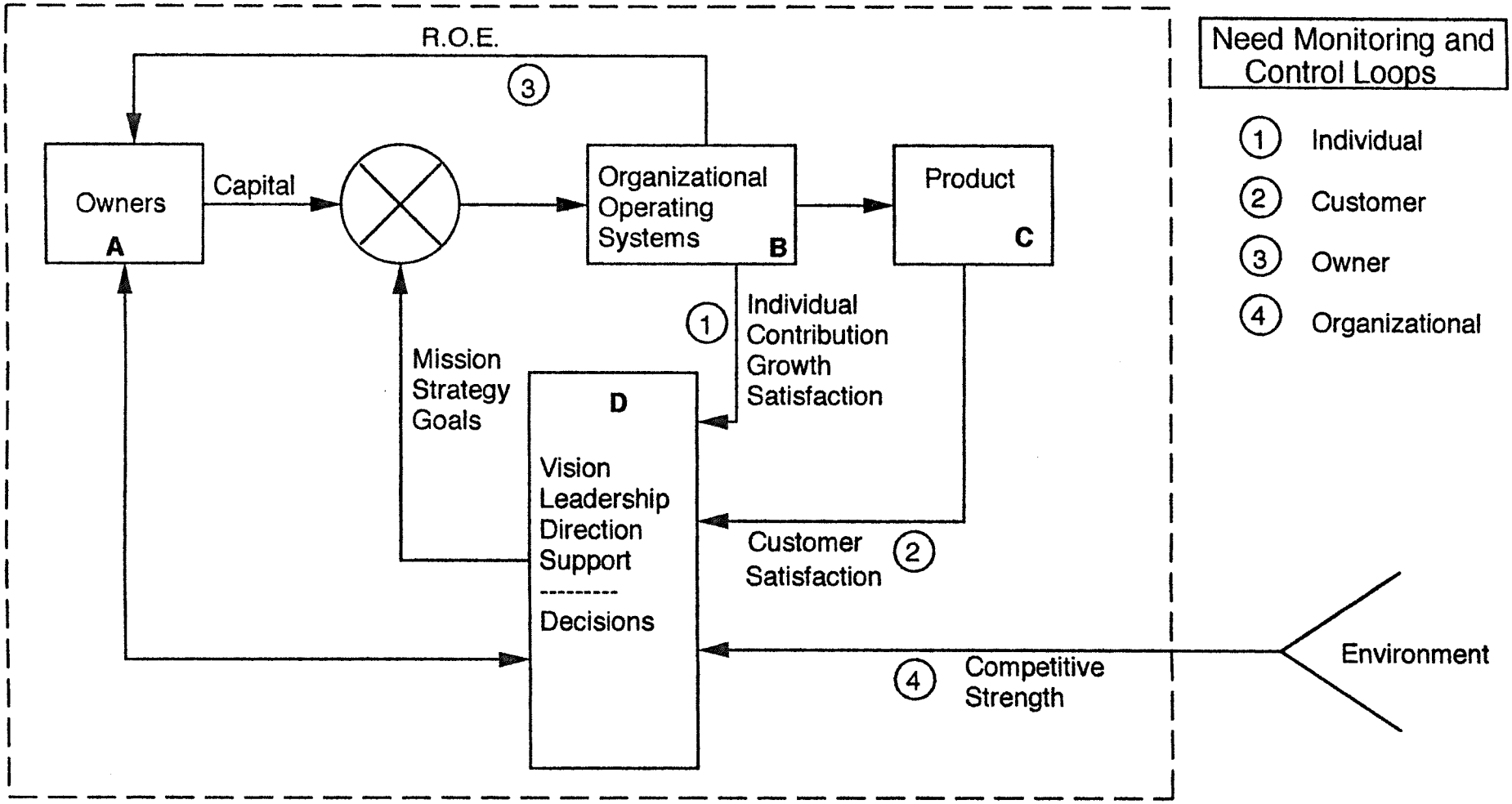


Fig. 6

Core Function / Support Relationships



The Dynamic Organizational Diagram

Fig. 7

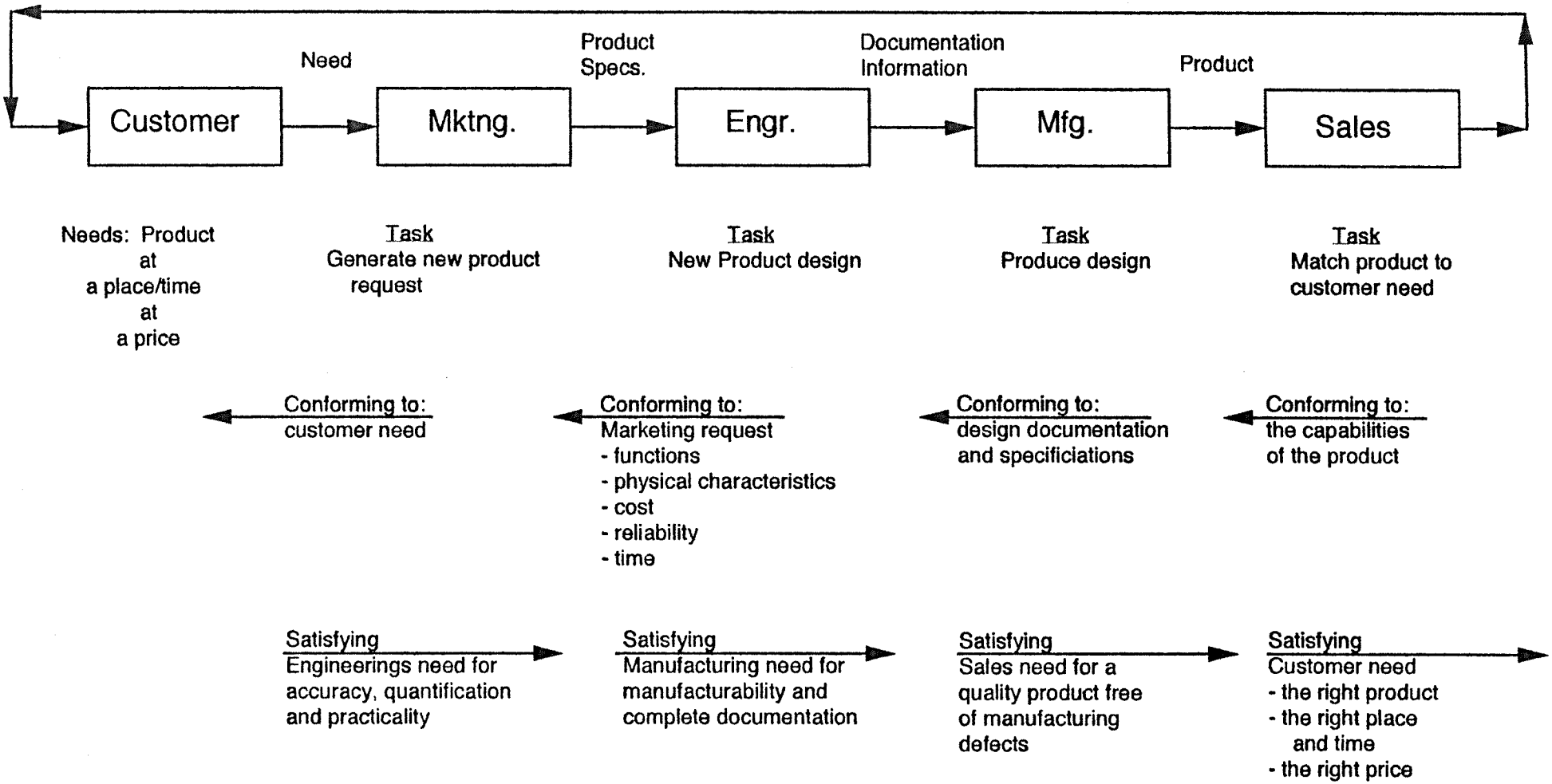


Fig. 8

Customer / Supplier Relationships in the Manufacturing Organization

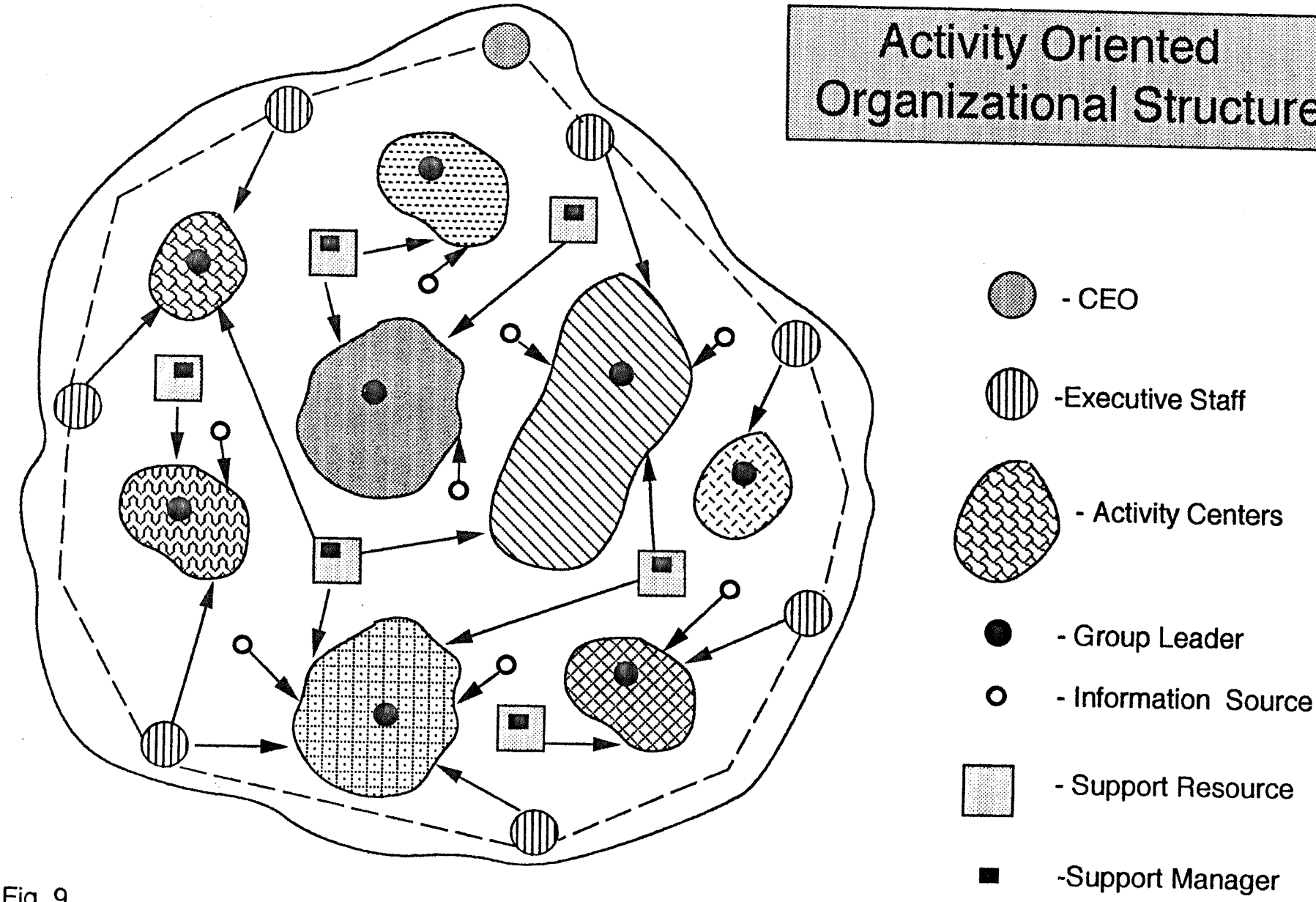
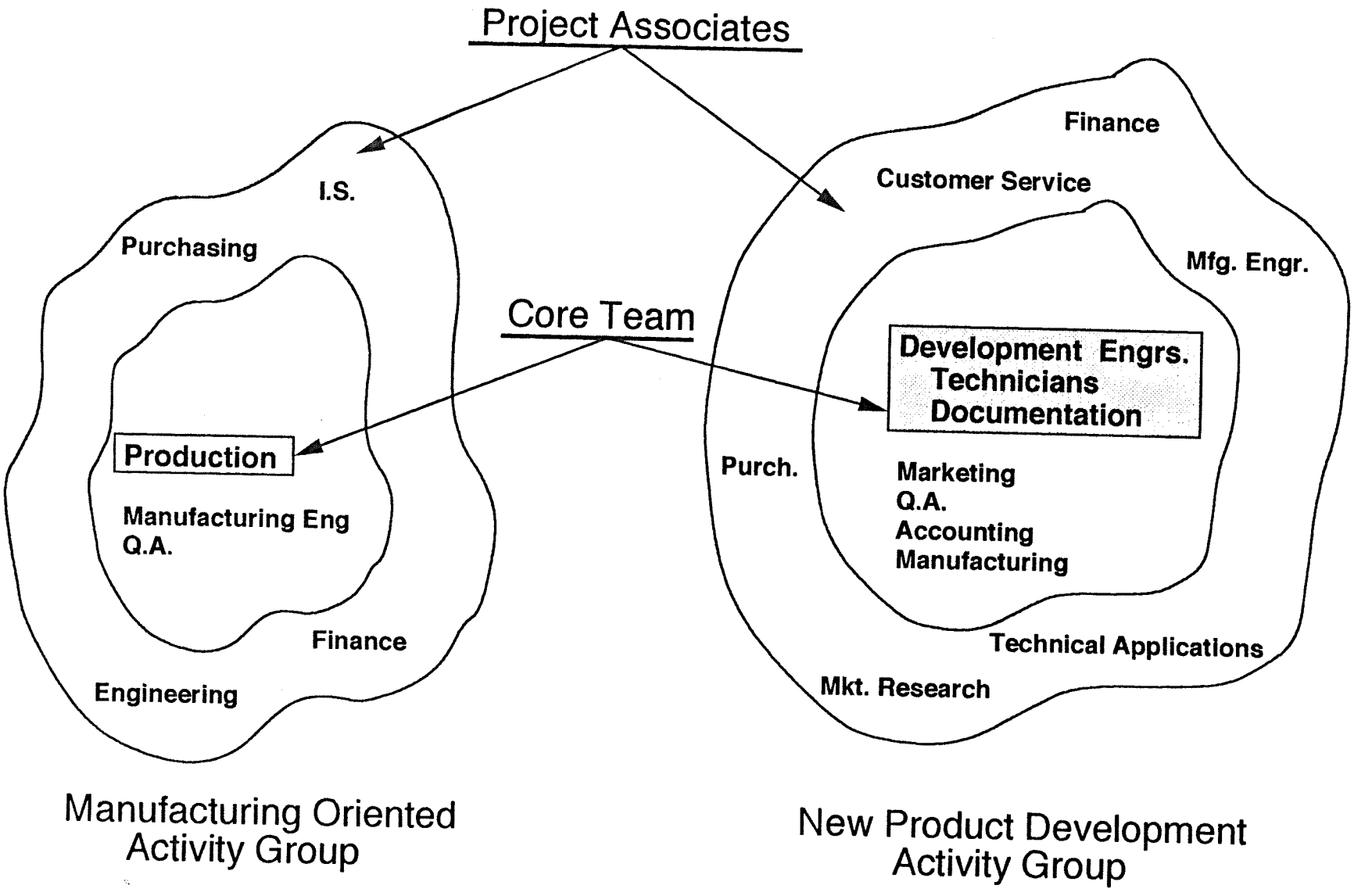

Activity Oriented
Organizational Structure
- CEO
-Executive Staff
- Activity Centers
- Group Leader
- Information Source
- Support Resource
-Support Manager

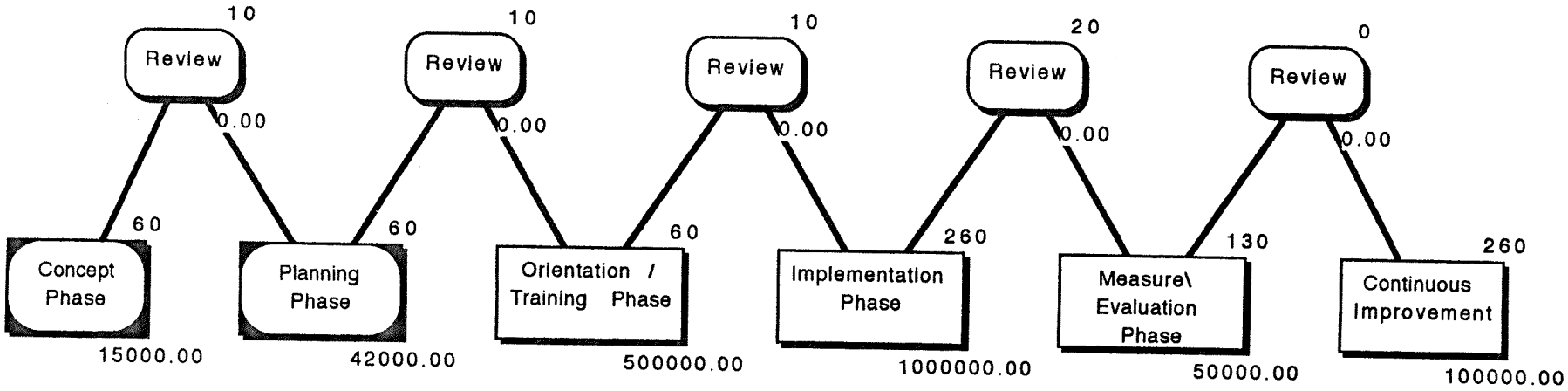
Fig. 9



Activity Center Relationships

Fig. 10

Corporate Revitalization Plan



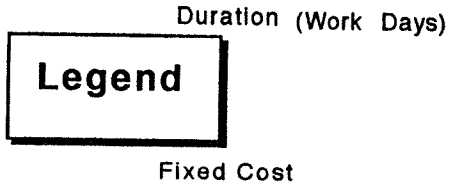


Fig. 11

Concept Phase Tasks

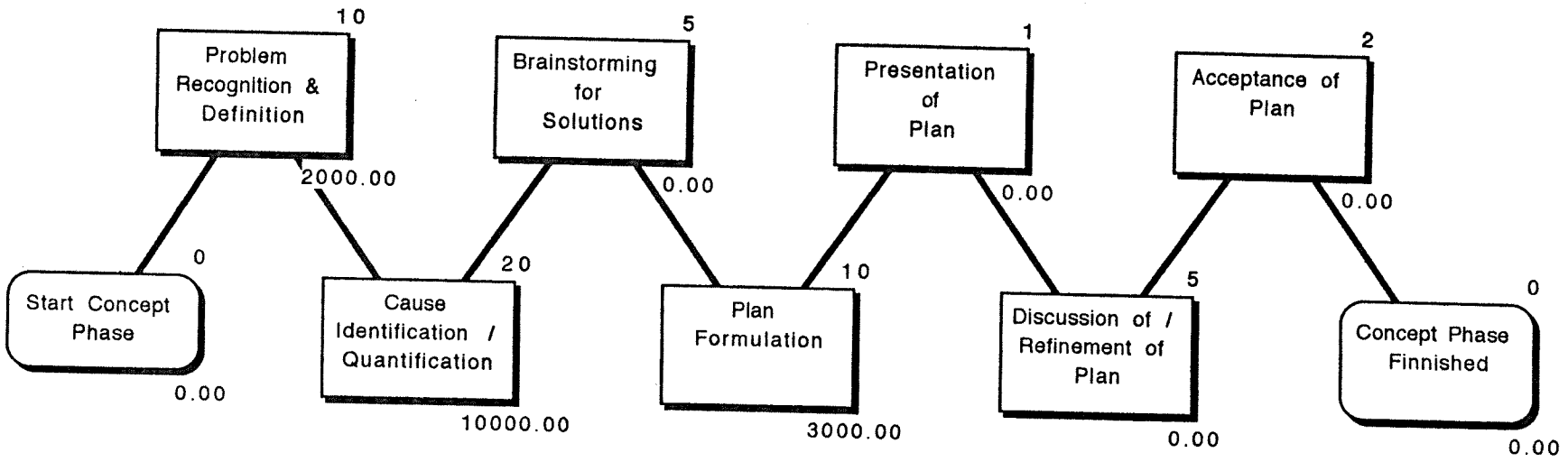


Fig. 11a

Planning Phase Tasks

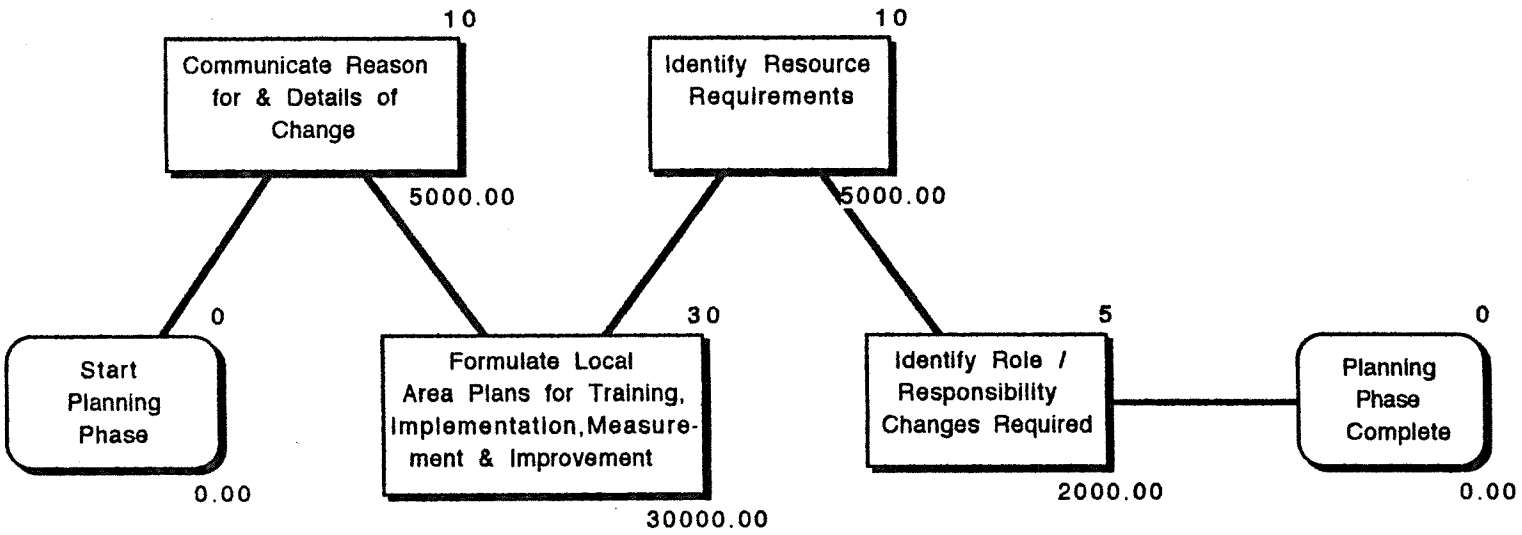


Fig. 11b

Corporate Revitalization Cash Flow Table

Starting	Plan Costs	Plan Income	Actual Costs	Actual Income	Ending	Plan Cumulati	Actual Cumulative
1/1/92	12000.00	0.00	0.00	0.00	2/1/92	-12000.00	0.00
2/1/92	3000.00	0.00	0.00	0.00	3/1/92	-15000.00	0.00
3/1/92	5000.00	0.00	0.00	0.00	4/1/92	-20000.00	0.00
4/1/92	30000.00	0.00	0.00	0.00	5/1/92	-50000.00	0.00
5/1/92	5000.00	0.00	0.00	0.00	6/1/92	-55000.00	0.00
6/1/92	52000.00	0.00	0.00	0.00	7/1/92	-107000.00	0.00
7/1/92	0.00	0.00	0.00	0.00	8/1/92	-107000.00	0.00
8/1/92	100000.00	10000.00	0.00	0.00	9/1/92	-197000.00	0.00
9/1/92	0.00	0.00	0.00	0.00	10/1/92	-197000.00	0.00
10/1/92	0.00	0.00	0.00	0.00	11/1/92	-197000.00	0.00
11/1/92	0.00	0.00	0.00	0.00	12/1/92	-197000.00	0.00
12/1/92	0.00	0.00	0.00	0.00	1/1/93	-197000.00	0.00
1/1/93	0.00	0.00	0.00	0.00	2/1/93	-197000.00	0.00
2/1/93	0.00	0.00	0.00	0.00	3/1/93	-197000.00	0.00
3/1/93	0.00	0.00	0.00	0.00	4/1/93	-197000.00	0.00
4/1/93	0.00	15000.00	0.00	0.00	5/1/93	-182000.00	0.00
5/1/93	10000.00	20000.00	0.00	0.00	6/1/93	-172000.00	0.00
6/1/93	0.00	0.00	0.00	0.00	7/1/93	-172000.00	0.00
7/1/93	0.00	0.00	0.00	0.00	8/1/93	-172000.00	0.00
8/1/93	0.00	0.00	0.00	0.00	9/1/93	-172000.00	0.00
9/1/93	0.00	0.00	0.00	0.00	10/1/93	-172000.00	0.00
10/1/93	0.00	0.00	0.00	0.00	11/1/93	-172000.00	0.00
11/1/93	0.00	0.00	0.00	0.00	12/1/93	-172000.00	0.00
12/1/93	0.00	0.00	0.00	0.00	1/1/94	-172000.00	0.00
1/1/94	0.00	2020000.00	0.00	0.00	2/1/94	1848000.00	0.00
2/1/94	0.00	0.00	0.00	0.00	3/1/94	1848000.00	0.00
3/1/94	0.00	0.00	0.00	0.00	4/1/94	1848000.00	0.00
4/1/94	0.00	0.00	0.00	0.00	5/1/94	1848000.00	0.00
5/1/94	0.00	0.00	0.00	0.00	6/1/94	1848000.00	0.00
6/1/94	0.00	0.00	0.00	0.00	7/1/94	1848000.00	0.00
7/1/94	0.00	0.00	0.00	0.00	8/1/94	1848000.00	0.00
8/1/94	0.00	0.00	0.00	0.00	9/1/94	1848000.00	0.00
9/1/94	0.00	0.00	0.00	0.00	10/1/94	1848000.00	0.00
10/1/94	0.00	0.00	0.00	0.00	11/1/94	1848000.00	0.00

Fig. 11c

Corporate Revitalization Task Timeline Chart

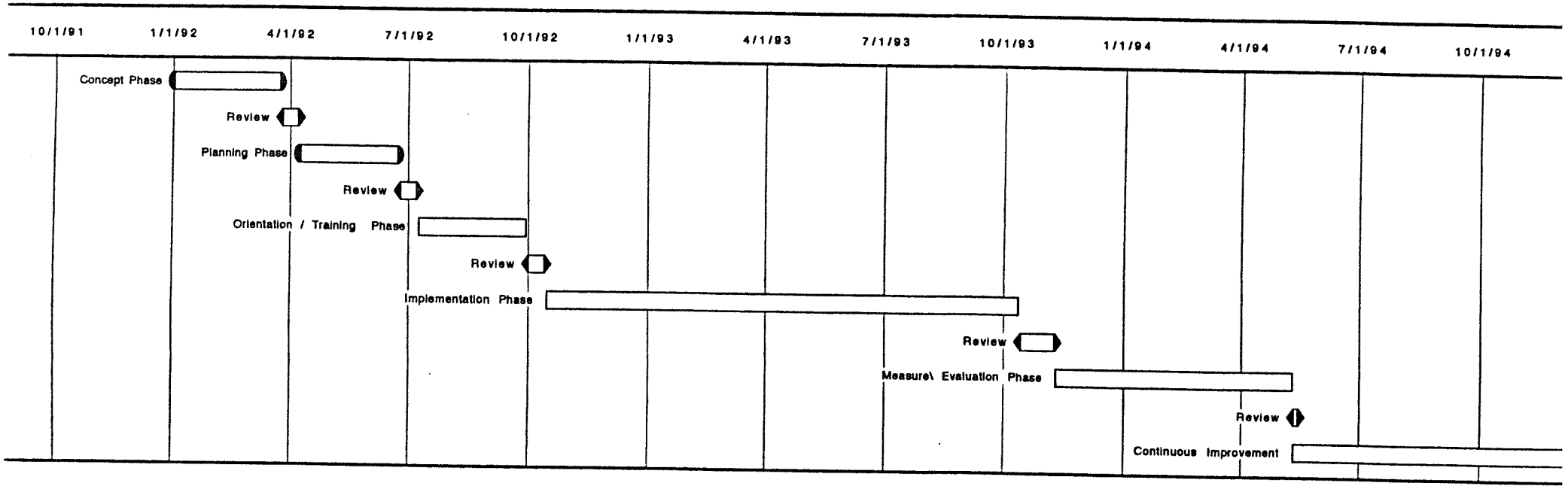


Fig. 11d

Production Area #1 Restructuring

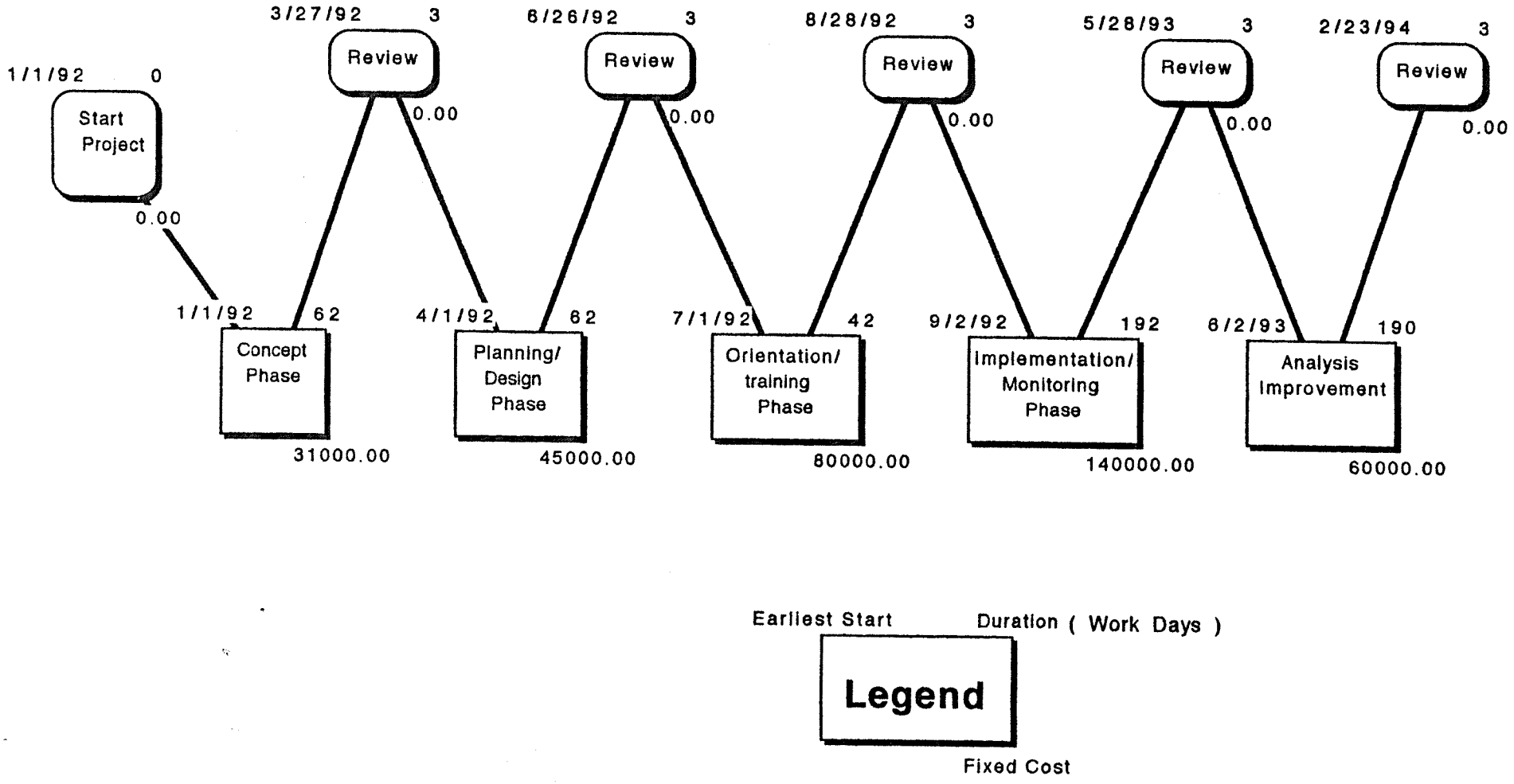


Fig. 12

Prdctn. Area #1; Investment / Return Analysis

	A	B	C	D	E	F	G	H
1								
2	Months >	1	2	3	4	5	6	7
3	Investment							
4	Project Phase:							
5	Concept							
6	Planning / Design							
7	Orientation / Training							
8	Implementation / Monitoring							
9	Analysis / Improvement							
10	Investment Schedule ($)	$8,000	$8,000	$15,000	$15,000	$15,000	$15,000	$40,000
11	Cumulative Investment	$8,000	$16,000	$31,000	$46,000	$61,000	$76,000	$116,000
12	12 Mo. Cum.							
13								
14	Return							
15	Per Unit Selling Price	1,729	1,729	1,729	1,729	1,729	1,729	1,729
16	Cost of per Unit Goods:							
17	Material	$756	$756	$756	$756	$756	$756	$756
18	Direct Labor	$147	$147	$147	$147	$147	$147	$147
19	Overhead	$569	$569	$569	$569	$569	$569	$569
20	Total Mfg. Cost	$1,472	$1,472	$1,472	$1,472	$1,472	$1,472	$1,472
21	Direct Mfg. Cost	$1,149	$1,149	$1,149	$1,149	$1,149	$1,149	$1,149
22	Direct Unit Cost	$1,310	$1,310	$1,310	$1,310	$1,310	$1,310	$1,310
23	Internal Quality Cost (per unit)	$27	$27	$27	$27	$27	$27	$27
24	External Quality Cost (per unit)	$14	$14	$14	$14	$14	$14	$14
25	Total Direct Cost per Unit	$1,351	$1,351	$1,351	$1,351	$1,351	$1,351	$1,351
26	Cash contribution per Unit	$378	$378	$378	$378	$378	$378	$378
27	After Tax Contribution	$215	$215	$215	$215	$215	$215	$215
28	Gross Profit per Unit	$257	$257	$257	$257	$257	$257	$257
29	Gross Profit Margin (%)	14.86	14.86	14.86	14.86	14.86	14.86	14.86
30								
31	Sales Volume (units)	900	900	900	900	900	900	900
32	Total After tax Contribution	$193,719	$193,719	$193,719	$193,719	$193,719	$193,719	$193,719
33								
34	Contribution Differential							
35	Cum. Contribution Dif.							
36	12 Mo. Cum.							

Fig. 13

Prdctn. Area #1; Investment / Return Analysis

	I	J	K	L	M	N	O	P	Q	R
1										
2	8	9	10	11	12	13	14	15	16	17
3										
4										
5										
6										
7	Orientation / Training									
8		Implementation / Monitoring								
9										
10	$40,000	$15,556	$15,556	$15,556	$15,556	$15,556	$15,556	$15,556	$15,556	$15,556
11	$156,000	$171,556	$187,112	$202,668	$218,224	$233,780	$249,336	$264,892	$280,448	$296,004
12					$218,224					
13										
14										
15	1,729	1,729	1,729	1,729	1,729	1,729	1,729	1,729	1,729	1,729
16										
17	$756	$756	$756	$756	$756	$756	$756	$756	$756	$756
18	$147	$147	$152	$157	$162	$165	$166	$164	$161	$159
19	$569	$569	$569	$569	$569	$569	$569	$569	$569	$569
20	$1,472	$1,472	$1,477	$1,482	$1,487	$1,490	$1,491	$1,489	$1,486	$1,484
21	$1,149	$1,149	$1,162	$1,174	$1,186	$1,193	$1,196	$1,191	$1,184	$1,179
22	$1,310	$1,310	$1,324	$1,338	$1,352	$1,360	$1,363	$1,358	$1,349	$1,344
23	$27	$27	$31	$30	$28	$25	$21	$18	$15	$14
24	$14	$14	$14	$16	$19	$20	$20	$19	$18	$15
25	$1,351	$1,351	$1,369	$1,384	$1,399	$1,405	$1,404	$1,395	$1,382	$1,373
26	$378	$378	$360	$345	$330	$324	$325	$334	$347	$356
27	$215	$215	$205	$197	$188	$184	$185	$191	$198	$203
28	$257	$257	$252	$247	$242	$239	$238	$240	$243	$245
29	14.86	14.86	14.57	14.29	14.00	13.82	13.77	13.88	14.05	14.17
30										
31	900	900	900	900	900	900	920	940	960	970
32	$193,719	$193,719	$184,532	$176,885	$169,237	$165,982	$170,309	$179,136	$189,702	$196,966
33										
34			($9,187)	($16,834)	($24,482)	($27,737)	($23,410)	($14,583)	($4,017)	$3,247
35			($9,187)	($26,021)	($50,503)	($78,241)	($101,650)	($116,234)	($120,251)	($117,004)
36					($50,503)					

Fig. 13

Prdctn. Area #1; Investment / Return Analysis

	S	T	U	V	W	X	Y	Z	AA	AB
1										
2	18	19	20	21	22	23	24	25	26	27
3										
4										
5										
6										
7										
8										
9	Analysis / Improvement									
10	$6,667	$6,667	$6,667	$6,667	$6,667	$6,667	$6,667	$6,667	$6,667	
11	$302,671	$309,338	$316,005	$322,672	$329,339	$336,006	$342,673	$349,340	$356,007	$356,007
12							$124,449			
13										
14										
15	1,729	1,729	1,729	1,729	1,729	1,729	1,729	1,729	1,729	1,729
16										
17	$756	$756	$756	$756	$756	$756	$756	$756	$756	$756
18	$154	$148	$142	$137	$134	$132	$131	$131	$131	$131
19	$569	$569	$569	$569	$569	$569	$569	$569	$569	$569
20	$1,479	$1,473	$1,467	$1,462	$1,459	$1,457	$1,456	$1,456	$1,456	$1,456
21	$1,167	$1,152	$1,137	$1,125	$1,118	$1,113	$1,110	$1,110	$1,110	$1,110
22	$1,330	$1,313	$1,296	$1,283	$1,274	$1,269	$1,266	$1,266	$1,266	$1,266
23	$13	$13	$13	$13	$13	$13	$13	$13	$13	$13
24	$13	$11	$10	$9	$8	$7	$7	$7	$7	$7
25	$1,356	$1,337	$1,319	$1,305	$1,295	$1,289	$1,286	$1,286	$1,286	$1,286
26	$373	$392	$410	$424	$434	$440	$443	$443	$443	$443
27	$213	$223	$233	$242	$247	$251	$253	$253	$253	$253
28	$250	$256	$262	$267	$270	$272	$273	$273	$273	$273
29	14.46	14.81	15.15	15.44	15.62	15.73	15.79	15.79	15.79	15.79
30										
31	980	980	980	980	980	980	980	980	980	980
32	$208,441	$218,881	$228,762	$237,090	$242,310	$245,976	$247,530	$247,530	$247,530	$247,530
33										
34	$14,722	$25,162	$35,043	$43,371	$48,591	$52,257	$53,811	$53,811	$53,811	$53,811
35	($102,282)	($77,120)	($42,077)	$1,295	$49,886	$102,143	$155,954	$209,765	$263,576	$317,387
36							$206,457			

Fig. 13

Prdctn. Area #1; Investment / Return Analysis

	AC	AD	AE	AF	AG	AH	AI	AJ	AK
1									
2	28	29	30	36	48	60	72		
3									
4									
5									
6									
7									
8									
9									
10									
11	$356,007	$356,007	$356,007	$356,007					
12				$13,334					
13									
14									
15	1,729	1,729	1,729	1,729					
16									
17	$756	$756	$756	$756					
18	$131	$131	$131	$131					
19	$569	$569	$569	$569					
20	$1,456	$1,456	$1,456	$1,456					
21	$1,110	$1,110	$1,110	$1,110					
22	$1,266	$1,266	$1,266	$1,266					
23	$13	$13	$13	$13					
24	$7	$7	$7	$7					
25	$1,286	$1,286	$1,286	$1,286					
26	$443	$443	$443	$443					
27	$253	$253	$253	$253	$253	$253	$253		
28	$273	$273	$273	$273					
29	15.79	15.79	15.79	15.79					
30									
31	980	980	980	980	980	980	980		
32	$247,530	$247,530	$247,530	$247,530	$247,528	$247,528	$247,528		
33									
34	$53,811	$53,811	$53,811	$53,811	$53,809	$53,809	$53,809		
35	$371,198	$425,009	$478,820	$852,114	$1,497,837	$2,143,550	$2,789,263		
36				$645,733	$645,723	$645,723	$645,723		

Fig. 13

Prdctn. Area #1; Investment / Return Analysis

	AL	AM	AN	AO	AP	AQ
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15		Year	Cash Flow	PVIF @	PV	
16				12%		
17		1	($268,727)	0.893	($239,974)	
18		2	$82,008	0.797	$65,361	
19		3	$632,399	0.712	$450,268	
20		4	$645,723	0.636	$410,680	
21		5	$645,723	0.567	$366,125	
22		6	$645,723	0.507	$327,382	
23						
24				NPV=	$1,379,841	
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						

Fig. 13

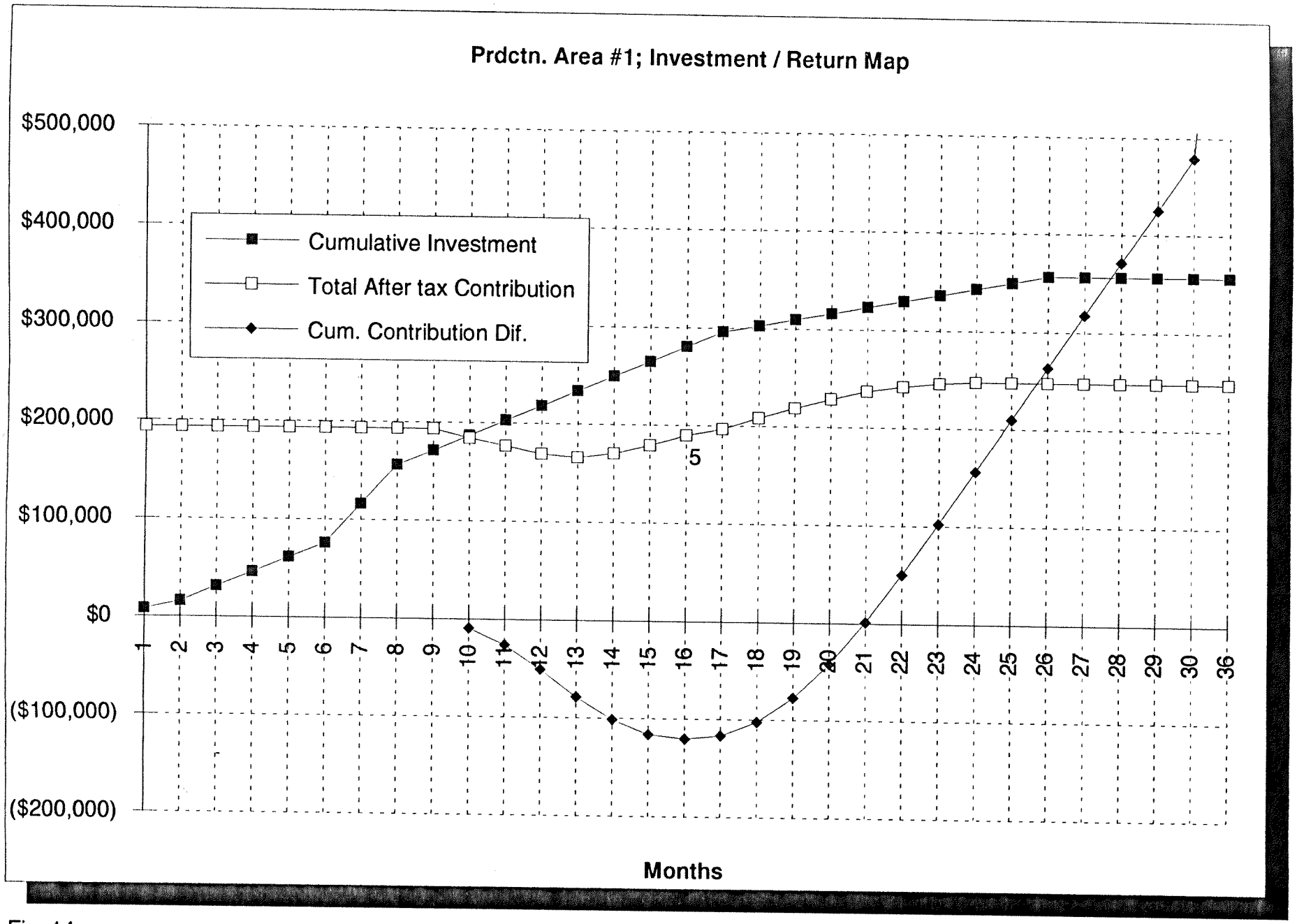

Prdctn. Area #1; Investment / Return Map
$500,000
$400,000
$300,000
$200,000
$100,000
$0
($100,000)
($200,000)
Cumulative Investment
Total After tax Contribution
Cum. Contribution Dif.
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
36
Months

Fig. 14

Product Development- Old Process; Investment / Return

	A	B	C	D	E	F	G	H	I
1									
2	Months >	1	2	3	4	5	6	7	8
3	Investment								
4	Project Phase:								
5	Concept / Planning								
6	Design								
7	Prototype								
8	Evaluation								
9	Documentation								
10	Preproduction								
11	Finalization								
12	Production								
13	Revenue Generation								
14	Investment Schedule ($)	$2,000	$5,000	$7,000	$10,000	$10,000	$10,000	$10,000	$15,000
15	Cumulative Investment	$2,000	$7,000	$14,000	$24,000	$34,000	$44,000	$54,000	$69,000
16	12 Mo. Cum.								
17	Return								
18	Per Unit Selling Price								
19	Cost of Unit Goods								
20	Material								
21	Direct Labor								
22	Overhead								
23	Total Mfg. cost								
24	Direct Mfg. Cost								
25	Direct Unit Cost								
26	Internal Quality Cost								
27	External Quality Cost								
28	Total Direct Cost per Unit								
29	Cash Contribution per Unit								
30	After Tax Contribution								
31	Gross Profit per Unit								
32	Gross Profit Margin (%)								
33	Sales Volume								
34	Cumulative Volume								
35	Total After Tax Cointribution								
36	Cumulative Contribution								
37	12 Mo. Cum.								

Fig. 15

Product Development- Old Process; Investment / Return

	J	K	L	M	N	O	P	Q	R	S
1										
2	9	10	11	12	13	14	15	16	17	18
3										
4										
5										
6	Design									
7		Prototype								
8										Evaluation
9	Document									
10								Preproduction		
11										
12										
13										
14	$15,000	$15,000	$15,000	$12,000	$12,000	$12,000	$7,000	$30,000	$10,000	$20,000
15	$84,000	$99,000	$114,000	$126,000	$138,000	$150,000	$157,000	$187,000	$197,000	$217,000
16				$126,000						
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										

Fig. 15

Product Development- Old Process; Investment / Return

	T	U	V	W	X	Y	Z	AA	AB	AC
1										
2	19	20	21	22	23	24	25	26	27	28
3										
4										
5										
6	Design									
7										
8		Evaluation								
9			Documentation							
10	Preproduction									
11							Finalization			
12										
13										
14	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$50,000	$70,000	$30,000	$20,000
15	$237,000	$257,000	$277,000	$297,000	$317,000	$337,000	$387,000	$457,000	$487,000	$507,000
16						$211,000				
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										

Fig. 15

Product Development- Old Process; Investment / Return

	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1										
2	29	30	31	32	33	34	35	36	37	38
3										
4										
5										
6										
7										
8										
9										
10										
11	Finalization									
12				Production						
13						Revenue Generation				
14	$20,000	$20,000	$20,000	$25,000	$30,000	$40,000	$50,000	$70,000	$30,000	$10,000
15	$527,000	$547,000	$567,000	$592,000	$622,000	$662,000	$712,000	$782,000	$812,000	$822,000
16								$445,000		
17										
18					$1,729	$1,729	$1,729	$1,729	$1,729	$1,729
19										
20					$756	$756	$756	$756	$756	$756
21					$160	$160	$160	$160	$155	$155
22					$569	$569	$569	$569	$569	$569
23					$1,485	$1,485	$1,485	$1,485	$1,480	$1,480
24					$1,181	$1,181	$1,181	$1,181	$1,169	$1,169
25					$1,347	$1,347	$1,347	$1,347	$1,333	$1,333
26					$55	$55	$50	$45	$40	$35
27								$34	$31	$26
28					$1,402	$1,402	$1,397	$1,426	$1,404	$1,394
29					$327	$327	$332	$303	$325	$335
30					$187	$187	$190	$173	$185	$191
31					$244	$244	$244	$244	$249	$249
32					14.1	14.1	14.1	14.1	14.4	14.4
33						300	450	600	750	900
34						300	750	1350	2100	3000
35						$55,996	$85,276	$103,783	$139,095	$172,043
36						$55,996	$141,271	$245,054	$384,149	$556,192
37								$245,054		

Fig. 15

Product Development- Old Process; Investment / Return

	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1									
2	39	40	41	42	43	44	45	46	47
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13	**Revenue Generation**								
14	$8,000	$5,000	$3,000	$2,000	$2,000	$2,000	$100	$100	$100
15	$830,000	$835,000	$838,000	$840,000	$842,000	$844,000	$844,100	$844,200	$844,300
16									
17									
18	$1,729	$1,729	$1,729	$1,729	$1,729	$1,729	$1,729	$1,729	$1,729
19									
20	$756	$756	$756	$756					
21	$150	$150	$147	$147					
22	$569	$569	$569	$569					
23	$1,475	$1,475	$1,472	$1,472					
24	$1,157	$1,157	$1,149	$1,149					
25	$1,319	$1,319	$1,310	$1,310					
26	$33	$31	$29	$27					
27	$20	$17	$15	$14					
28	$1,372	$1,367	$1,354	$1,351					
29	$357	$362	$375	$378					
30	$204	$206	$214	$215	$215	$215	$215	$215	$215
31	$254	$254	$257	$257					
32	14.7	14.7	14.9	14.9					
33	900	900	900	900	900	900	900	900	900
34	3900	4800	5700	6600	7500	8400	9300	10200	11100
35	$183,282	$185,847	$192,180	$193,719	$193,500	$193,500	$193,500	$193,500	$193,500
36	$739,475	$925,322	$1,117,502	$1,311,221	$1,504,721	$1,698,221	$1,891,721	$2,085,221	$2,278,721
37									

Fig. 15

Product Development- Old Process; Investment / Return

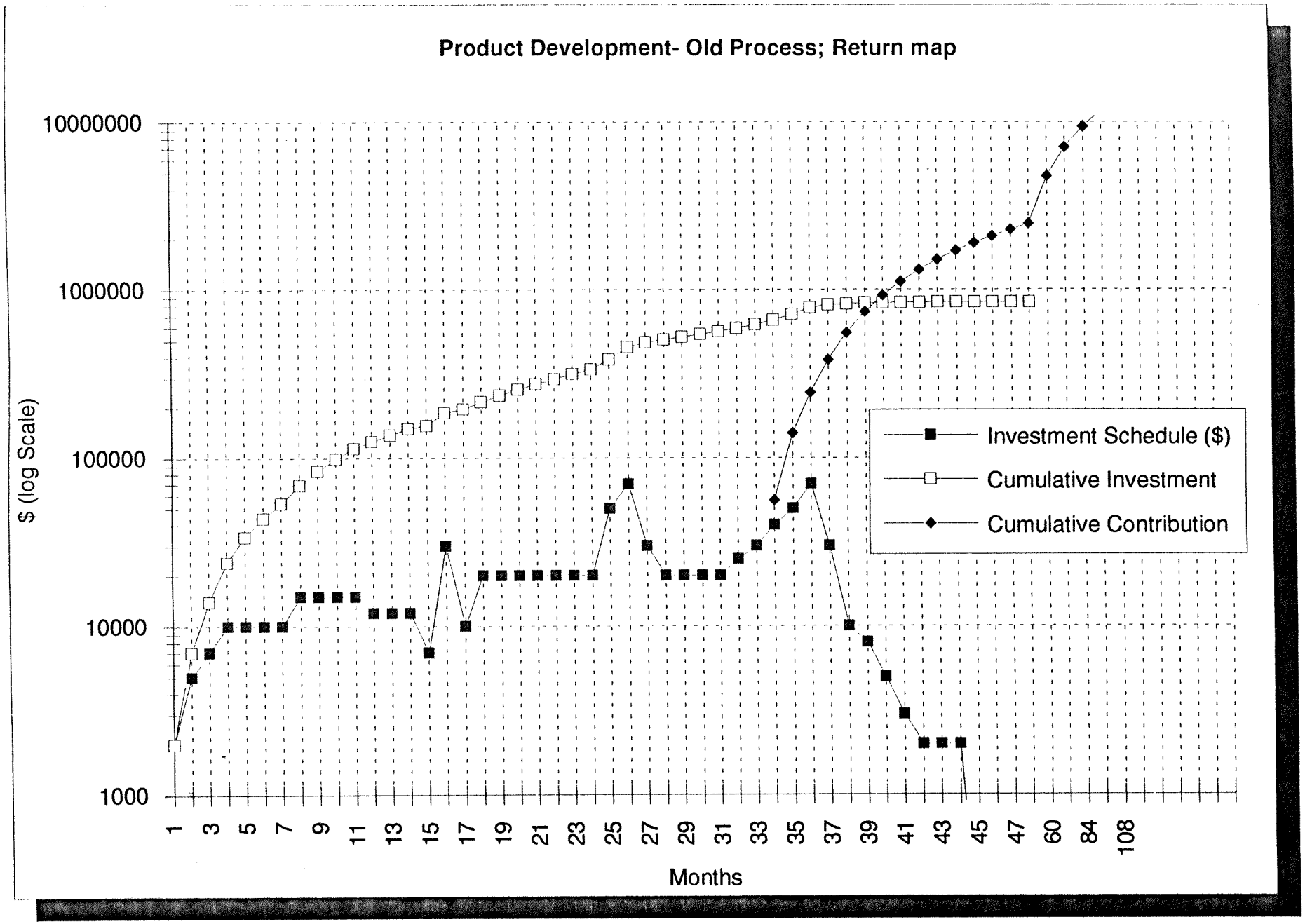
	AW	AX	AY	AZ	BA	BB	BC	BD	BE
1									
2	48	60	72	84	96	108			
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13	**Revenue Generation**								
14	$100								
15	$844,400								
16	$62,400								
17									
18	$1,729								
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30	$215	$215	$215	$215	$215	$215			
31									
32									
33	900	900	900	900	900	900			
34	12000	22800	33600	44400	55200	66000			
35	$193,500	$193,500	$193,500	$193,500	$193,500	$193,500			
36	$2,472,221	$4,794,221	$7,116,221	$9,438,221	$11,760,221	$14,082,221			
37	$2,227,167	$2,322,000	$2,322,000	$2,322,000	$2,322,000	$2,322,000			

Fig. 15

Product Development- Old Process; Investment / Return

Year	Cash Flow	PVIF @ 12%	PV
1	($126,000)	0.893	($112,518)
2	($211,000)	0.797	($168,167)
3	($199,946)	0.712	($142,361)
4	$2,164,767	0.636	$1,376,792
5	$2,322,000	0.567	$1,316,574
6	$2,322,000	0.507	$1,177,254
7	$2,322,000	0.452	$1,049,544
8	$2,322,000	0.404	$938,088
9	$2,322,000	0.361	$838,242
		NPV=	$6,273,447

Fig. 15


Product Development- Old Process; Return map
10000000
1000000
100000
10000
1000
$ (log Scale)
1
3
5
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11
13
15
17
19
21
23
25
27
29
31
33
35
37
39
41
43
45
47
60
84
108
Months
Investment Schedule ($)
Cumulative Investment
Cumulative Contribution

Fig. 16

Product Development- New Process; Investment / Return

	A	B	C	D	E	F	G	H	I
1									
2	Months >	1	2	3	4	5	6	7	8
3	**Investment**								
4	**Project Phase:**								
5	Concept / Planning								
6	Design								
7	Prototype								
8	Evaluation								
9	Documentation								
10	Preproduction								
11	Finalization								
12	Production								
13	Revenue Generation								
14	**Investment Schedule ($)**	$5,569	$20,556	$19,699	$9,139	$31,269	$44,268	$33,956	$32,403
15	**Cumulative Investment**	$5,569	$26,125	$45,824	$54,963	$86,232	$130,500	$164,456	$196,859
16	12 Mo. Cum.								
17	**Return**								
18	**Per Unit Selling Price**								
19	**Cost of Unit Goods:**								
20	Material								
21	Direct Labor								
22	Overhead								
23	Total Mfg. cost								
24	Direct Mfg. Cost								
25	Direct Unit Cost								
26	Internal Quality Cost								
27	External Quality Cost								
28	Total Direct Cost per Unit								
29	Cash Contribution per Unit								
30	After Tax Contribution								
31	**Gross Profit per Unit**								
32	**Gross Profit Margin (%)**								
33	**Sales Volume**								
34	**Cumulative Volume**								
35	**Total After Tax Cointribution**								
36	**Cumulative Contribution**								
37	12 Mo. Cum.								

Fig. 17

Product Development- New Process; Investment / Return

	J	K	L	M	N	O	P	Q	R	S
1										
2	9	10	11	12	13	14	15	16	17	18
3										
4										
5										
6		Design								
7			Prototype							
8							Evaluation			
9									Documentation	
10										
11										
12										
13										
14	$30,403	$23,403	$65,710	$11,570	$5,789	$9,717	$101,207	$93,681	$43,675	$32,346
15	$227,262	$250,665	$316,375	$327,945	$333,734	$343,451	$444,658	$538,339	$582,014	$614,360
16				$327,945						
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										

Fig. 17

Product Development- New Process; Investment / Return

	T	U	V	W	X	Y	Z	AA	AB
1									
2	19	20	21	22	23	24	25	26	27
3									
4									
5									
6									
7									
8									
9	Documentation								
10			Preproduction						
11				Finalization					
12				Production					
13						Revenue Generation			
14	$115,629	$63,154	$274,090	$59,430	$104,951	$37,589	$15,500	$5,000	$2,000
15	$729,989	$793,143	$1,067,233	$1,126,663	$1,231,614	$1,269,203	$1,284,703	$1,289,703	$1,291,703
16						$211,000			
17									
18					$1,748				
19									
20					$838				
21					$112				
22					$364				
23					$1,314				
24					$1,150				
25					$1,311				
26					$10				
27					$5				
28					$1,326				
29					$422				
30					$241	$241	$241	$241	$241
31					$434				
32					24.8				
33						400	800	1,200	1,200
34						400	1,200	2,400	3,600
35						$96,261	$192,800	$289,200	$289,200
36						$96,261	$289,061	$578,261	$867,461
37						$96,261			

Fig. 17

Product Development- New Process; Investment / Return

	AC	AD	AE	AF	AG	AH	AI	AJ	AK
1									
2	28	29	30	31	32	33	34	35	36
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13	Revenue Generation								
14	$1,000	$1,000	$1,000	$500	$500	$200	$200	$100	
15	$1,292,703	$1,293,703	$1,294,703	$1,295,203	$1,295,703	$1,295,903	$1,296,103	$1,296,203	$1,296,203
16									$445,000
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30	$241	$241	$241	$241	$241	$241	$241	$241	$241
31									
32									
33	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
34	4,800	6,000	7,200	8,400	9,600	10,800	12,000	13,200	14,400
35	$289,200	$289,200	$289,200	$289,200	$289,200	$289,200	$289,200	$289,200	$289,200
36	$1,156,661	$1,445,861	$1,735,061	$2,024,261	$2,313,461	$2,602,661	$2,891,861	$3,181,061	$3,470,261
37									$3,374,000

Fig. 17

Product Development- New Process; Investment / Return

	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1									
2	48	60	72	84	96	108			
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13	Revenue Generation								
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30	$241	$241	$241	$241	$241	$241			
31									
32									
33	1,200	1,200	1,200	1,200	1,200	1,200			
34	28,800	43,200	57,600	72,000	86,400	100,800			
35	$289,200	$289,200	$289,200	$289,200	$289,200	$289,200			
36	$6,940,661	$10,411,061	$13,881,461	$17,351,861	$20,822,261	$24,292,661			
37	$3,470,400	$3,470,400	$3,470,400	$3,470,400	$3,470,400	$3,470,400			

Fig. 17

Product Development- New Process; Investment / Return

	AU	AV	AW	AX	AY	AZ
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18		Year	Cash Flow	PVIF @	PV	
19				12%		
20		1	($327,945)	0.893	($292,855)	
21		2	($114,739)	0.797	($91,447)	
22		3	$2,929,000	0.712	$2,085,448	
23		4	$3,470,400	0.636	$2,207,174	
24		5	$3,470,400	0.567	$1,967,717	
25		6	$3,470,400	0.507	$1,759,493	
26		7	$3,470,400	0.452	$1,568,621	
27		8	$3,470,400	0.404	$1,402,042	
28		9	$3,470,400	0.361	$1,252,814	
29						
30				NPV =	$11,859,007	
31						
32						
33						
34						
35						
36						
37						

Fig. 17

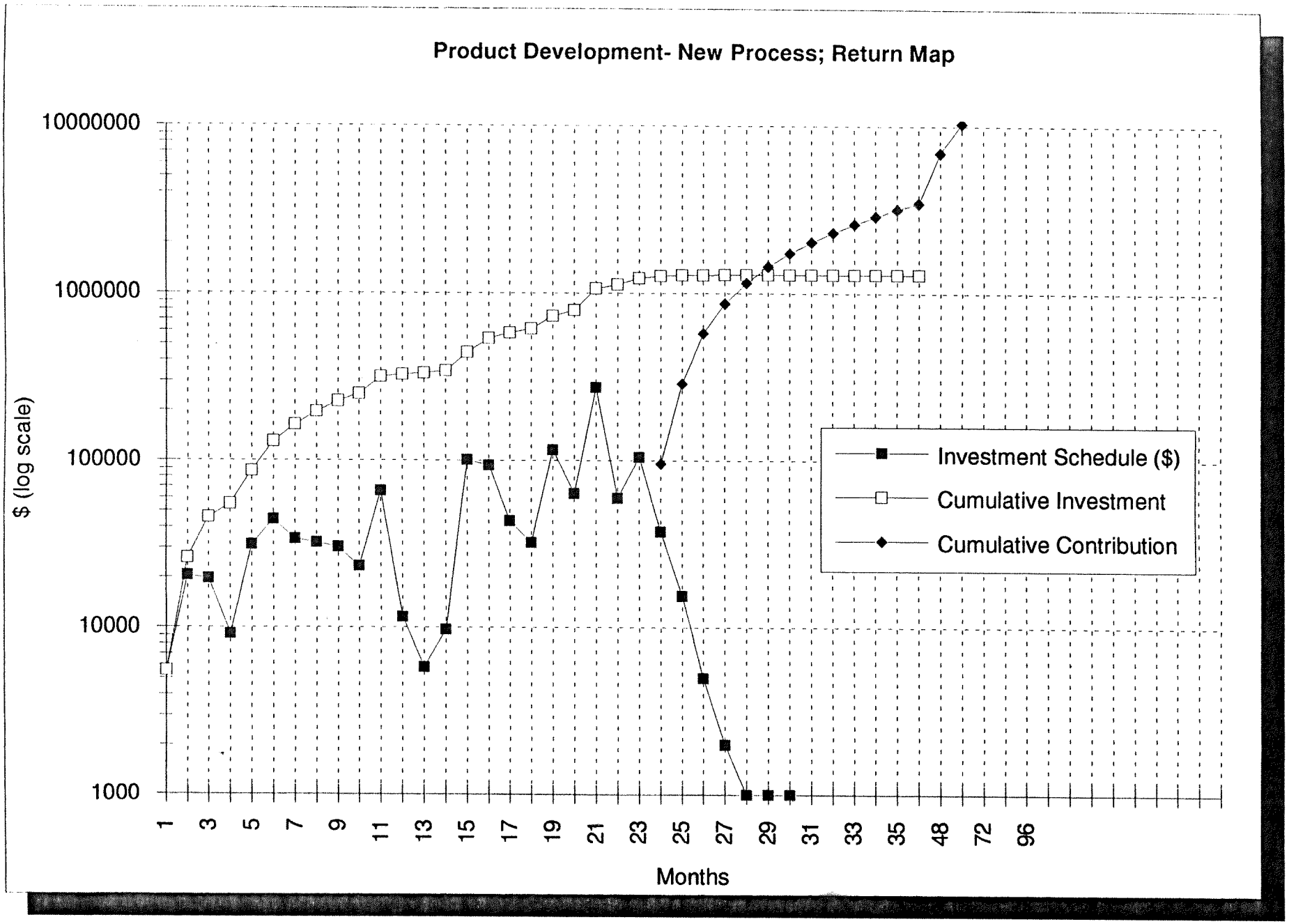

Product Development- New Process; Return Map
10000000
1000000
100000
10000
1000
$ (log scale)
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
48
72
96
Months
Investment Schedule ($)
Cumulative Investment
Cumulative Contribution

Fig. 18

New Product Development: Comparison of Old and New Process Results

	Sequential, Functionally Isolated Process	Concurrent, Functionally Integrated Process
Investment / Return Period	9 Yr.	9 Yr.
Cumulative Investment	$844,400	$1,296,203
Time to Introduction	34 Mo.	24 Mo.
Time to Final Mfg. Cost	42 Mo.	24 Mo.
Cumulative After Tax Cash Contribution Generated	$14,082,221	$24,292,661
Net Present Value of Project	$6,273,447	$11,859,007
Time to Break Even	40 Mo.	29 Mo.

Fig. 19

Organization of Work and Return on Investment

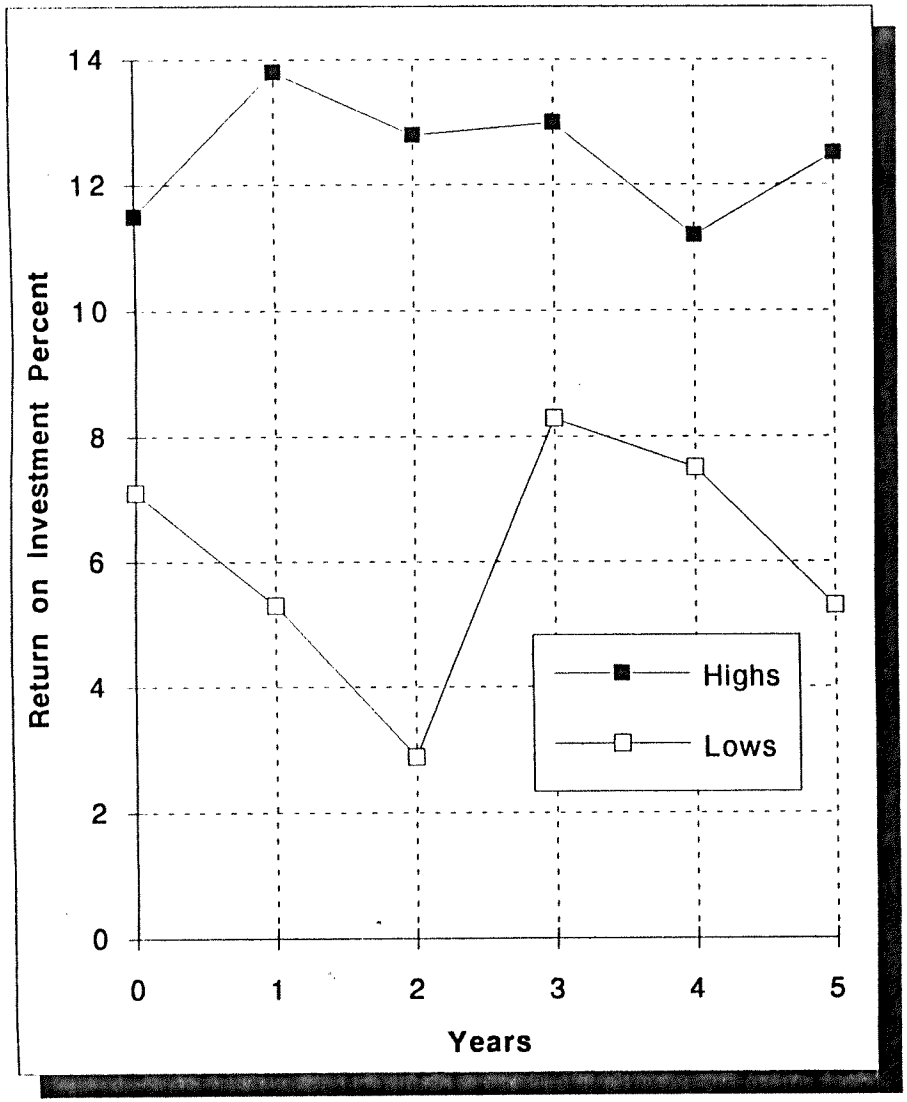


Fig. 20

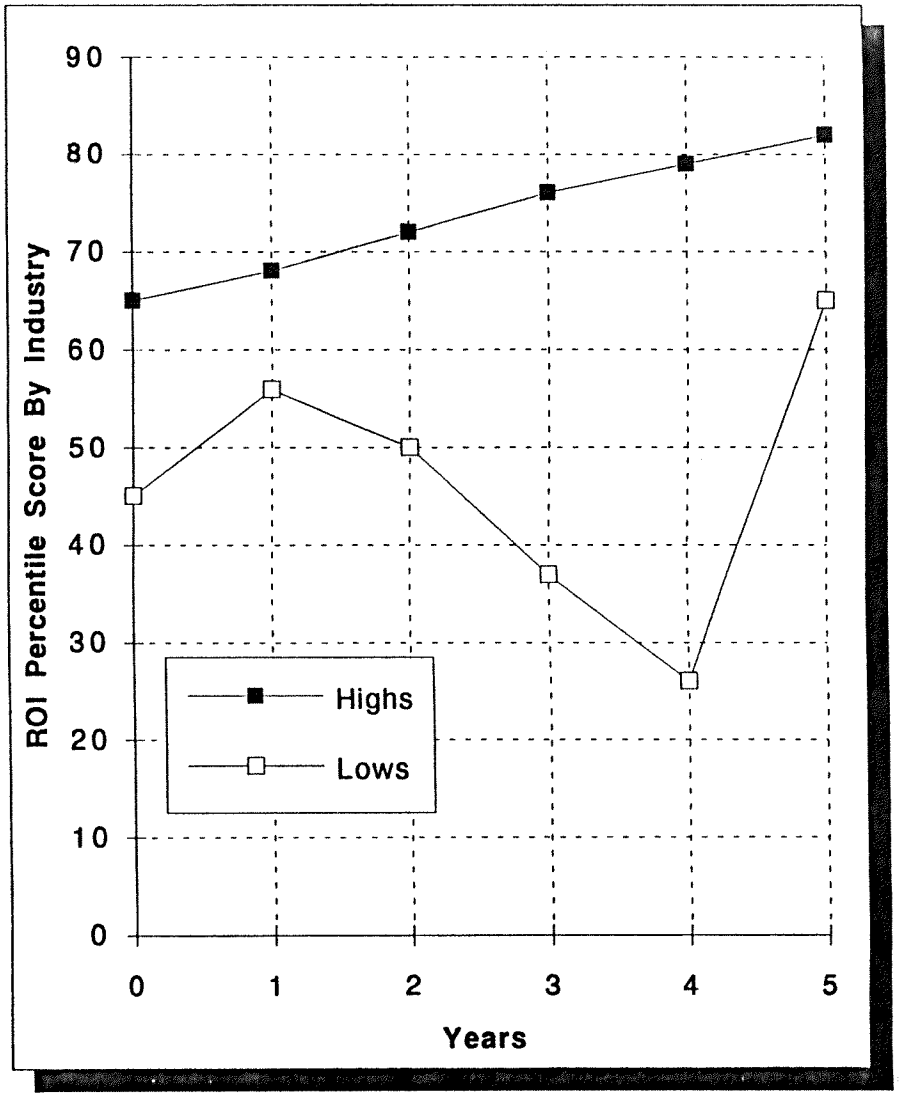


Fig. 21

Source (Figs. 20-27): Denison, Daniel R. "Bringing Corporate Culture to the Bottom Line" (Organizational Dynamics: Autumn ,84, Pgs. 5-22)

Organization of Work and Return on Sales

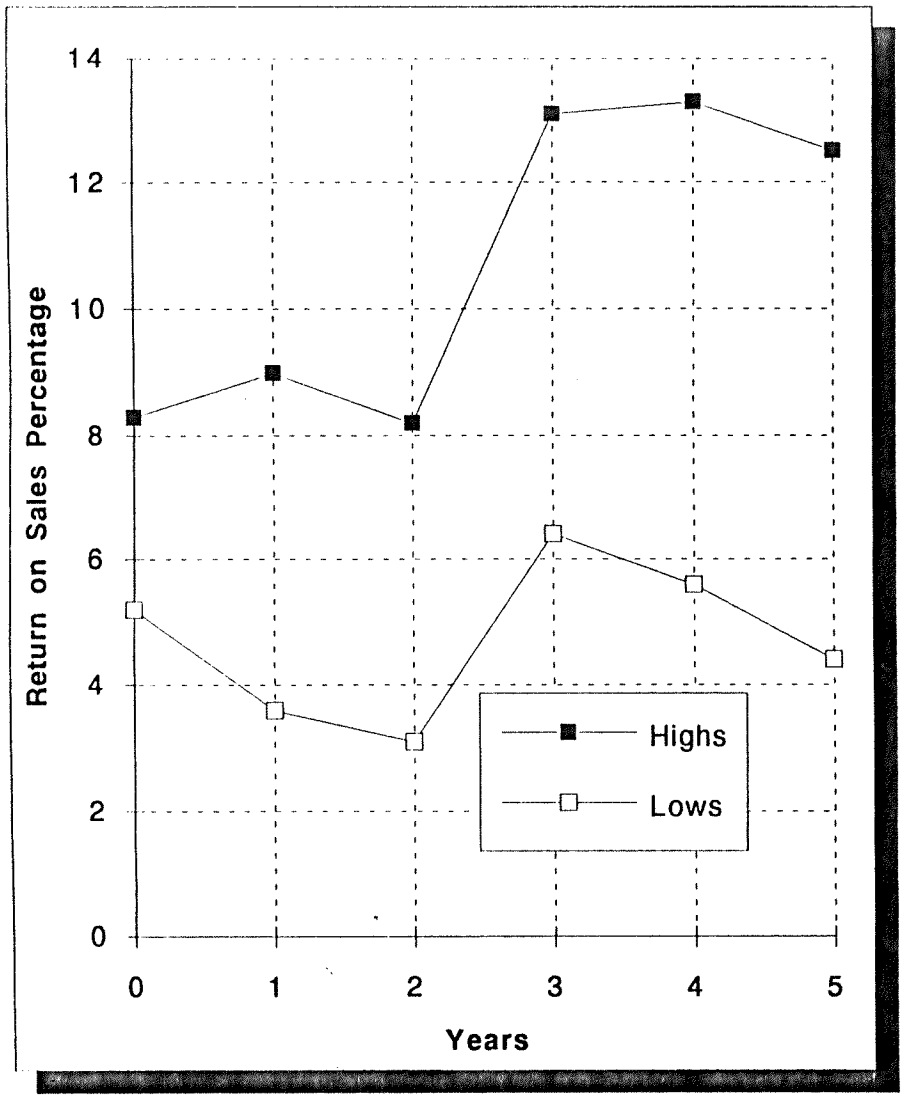


Fig. 22

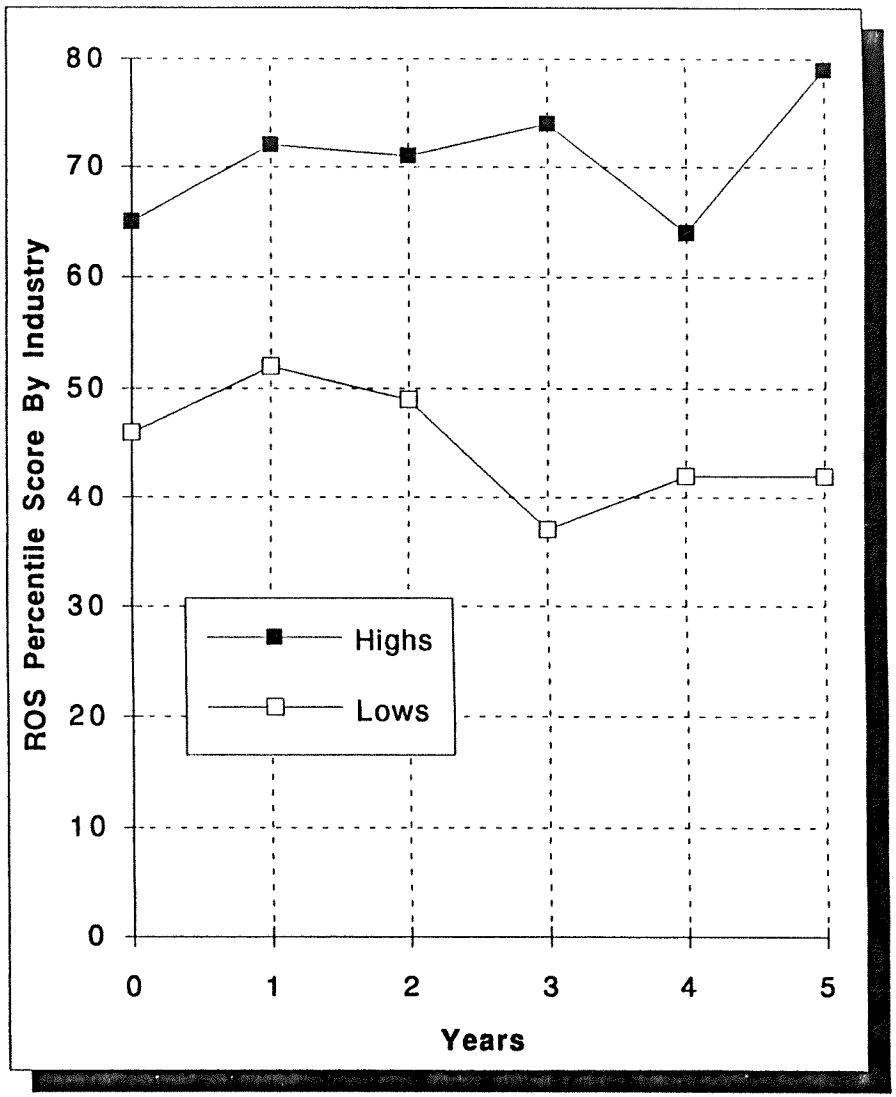


Fig. 23

Decision-Making Practices and Return on Investment

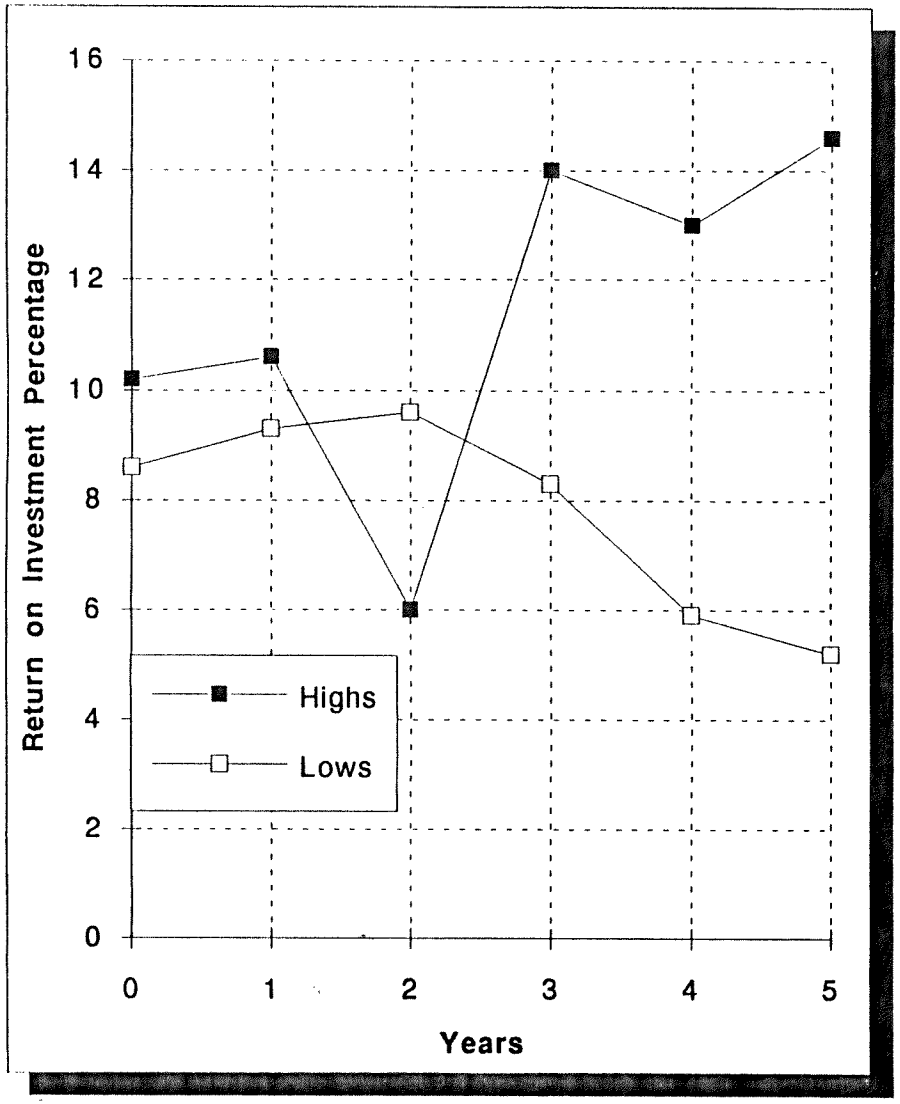


Fig. 24

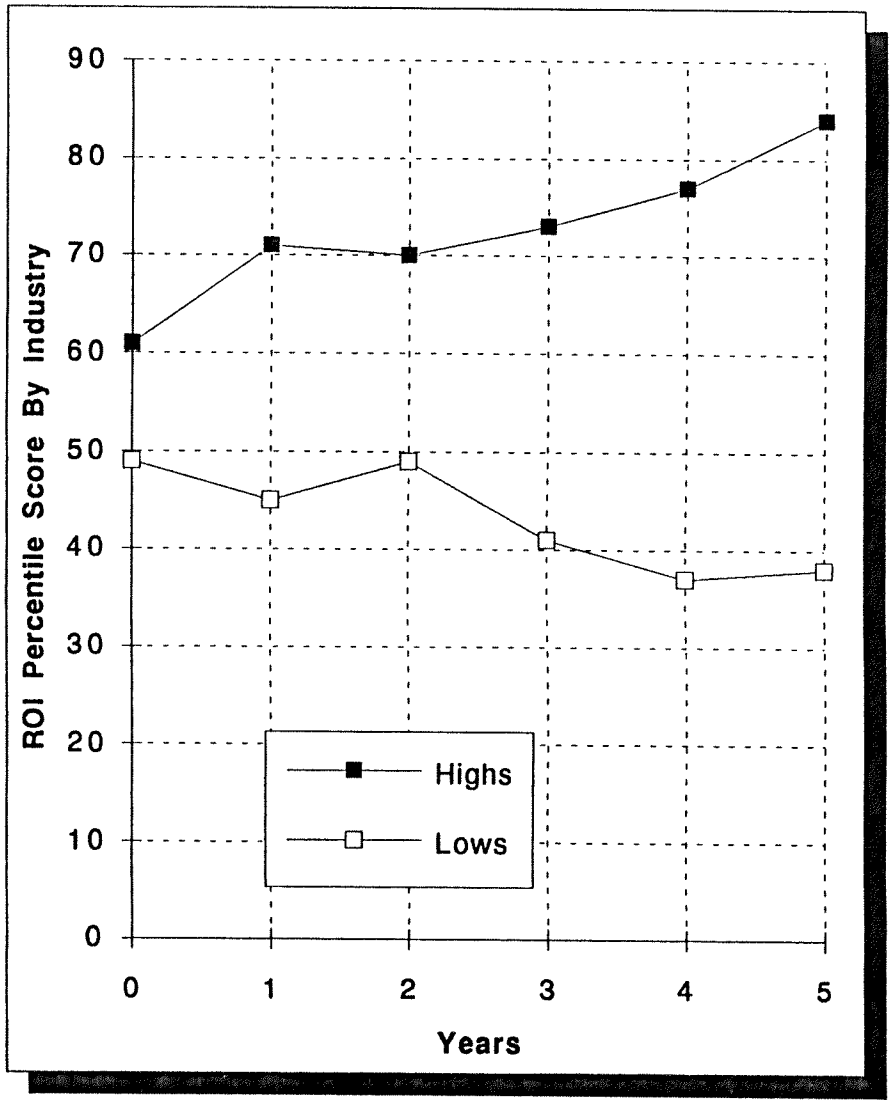


Fig. 25

Decision-Making Practices and Return on Sales

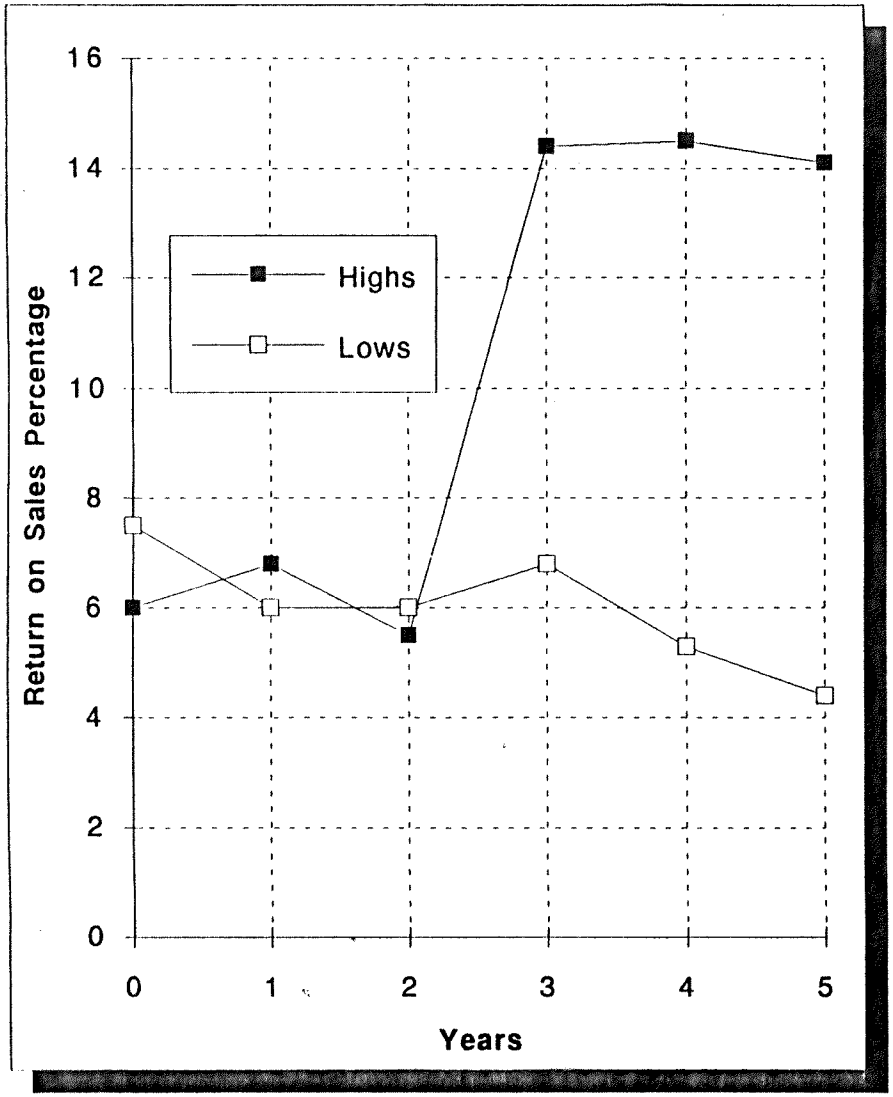


Fig. 26

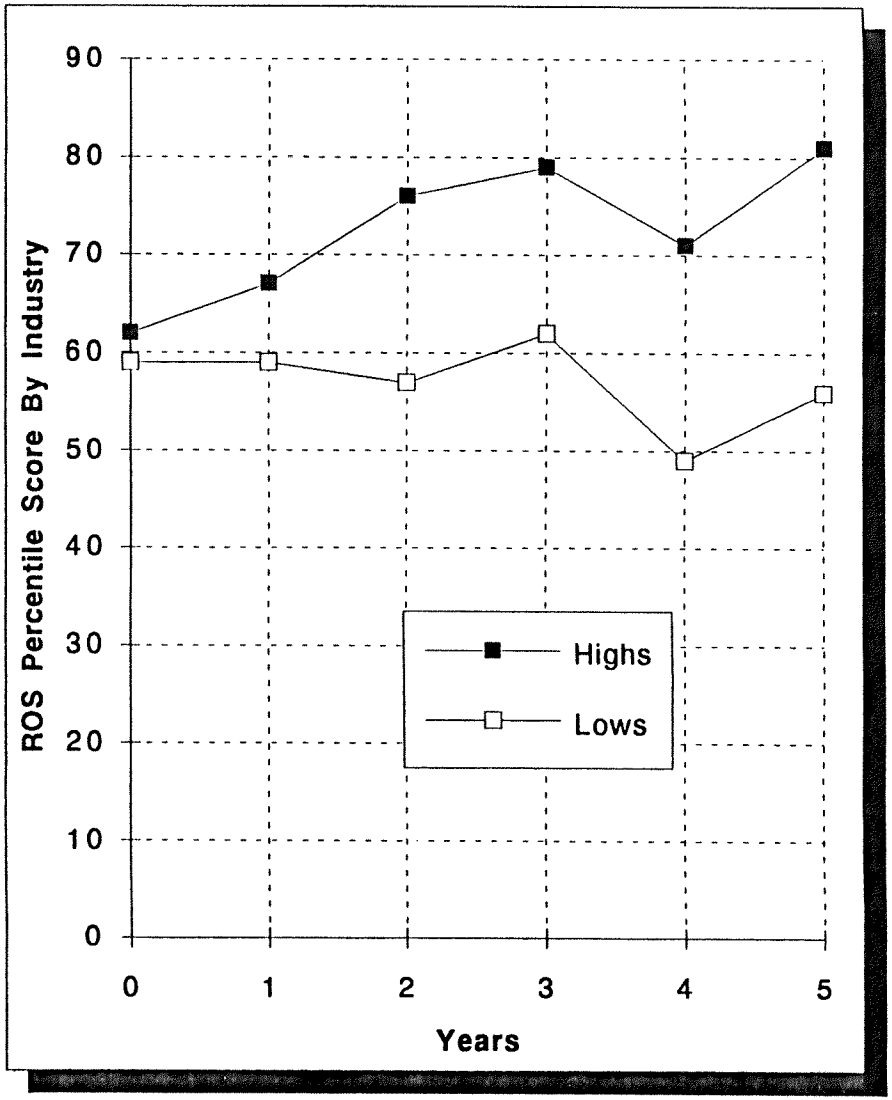


Fig. 27

Corporate Culture vs. Performance

Industry	Higher performers	Lower Performers	Culture/Environment Fit (7=High; 1=Low)	Cultural Values Related to Leadership (7=Absolutely Yes; 1=Definitely Not)	Cultural Values Related to Serving Stakeholders (7=Absolutely Yes; 1= Definitely Not)	Index of Annual Net Income Growth	Annual Return on Invested Capital (%)	Annual Growth of Stock Price (%)
Airlines	American		6.2	6	5.6	23.5	4.69	23.69
		Northwest	3.7	3.4	3.8	10.3	5.24	10.65
Banking	Bankers Trust		6.5	5.8	5.3	45.3	9.84	20.43
		Citicorp	3	5.5	3.8	18.2	4.98	10.3
Beverages	Anheuser-Busch		6.4	5	5.5	43.7	12.43	23.3
	PepsiCo		5.5	6.6	5.5	22.2	12.95	14.1
		Coors	2.2	2.5	3.1	9.2	7.69	4.2
Office Equip. & Computers	Hewlett-Packard		5.7	4.8	6.1	40.2	16.35	17.5
		Xerox	3.8	3.8	4.7	13.1	8.86	4.35
Food	ConAgra		6.4	6.8	6.6	103.1	13.34	35.65
		Archer Daniels	6.2	4.8	5.6	27.7	9.78	18.58
Oil	Shell		6.5	6.2	5.3	20.7	10.13	14.96
		Texaco	2.6	3	3	9.9	5.36	4.7
Food & Drug Retailing	Albertsons		6.2	6.6	6.3	34.1	12.64	27.82
		Winn-Dixie	3	3.2	4	16.4	16.4	5.24
Other Retailing	Dayton Hudson		4.4	6	5.1	32.1	10.09	17.35
	Wal-Mart		6.8	6.8	6.9	139	18.7	46.67
		J.C. Penney	4.1	4.2	4.6	16	8.9	10.65
Savings & Loan	Golden West		7	5.6	5.9	39.2	5.37	24.97
		H.F. Ahmanson	5	5.2	5	12.4	4.49	12.8
Textiles	Springs Industries		5.3	5.7	5.9	24	7.02	15.53
		Fieldcrest Cannc	3.6	3.1	4.1	8.3	5.64	6.4
	Mean		6.1	6	5.8	47.26	11.13	23.5
	Mean		3.7	3.9	4.2	14.15	7.73	8.79

Fig. 28

Source (Figs. 28-32): Kotter, John P. and James L. Heskett "Corporate Culture and Performance" (Free Press 1992)

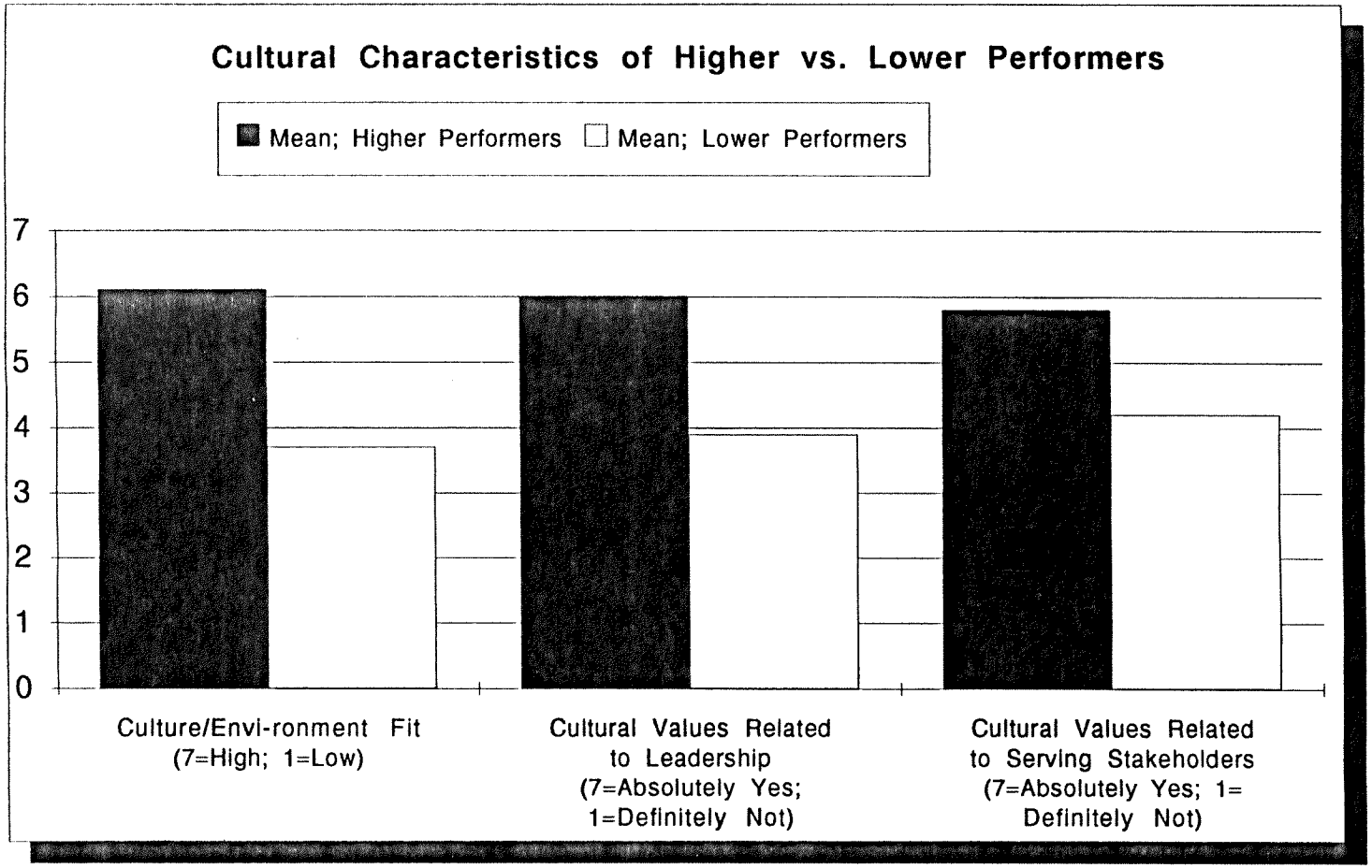

Cultural Characteristics of Higher vs. Lower Performers
Mean; Higher Performers
Mean; Lower Performers
7
6
5
4
3
2
1
0
Culture/Envi-ronment Fit (7=High; 1=Low)
Cultural Values Related to Leadership (7=Absolutely Yes; 1=Definitely Not)
Cultural Values Related to Serving Stakeholders (7=Absolutely Yes; 1= Definitely Not)

Fig. 29

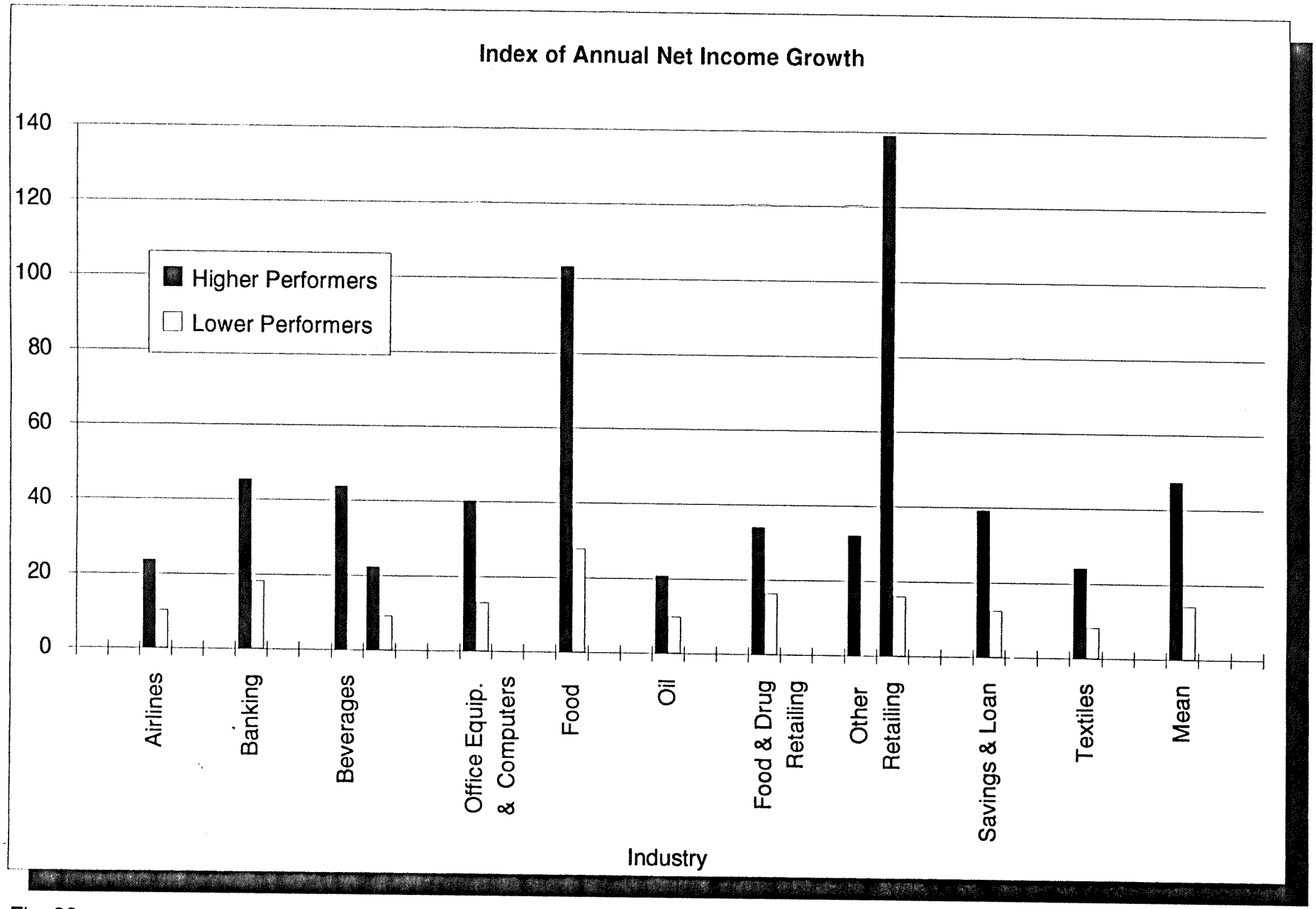

Index of Annual Net Income Growth
140
120
100
80
60
40
20
0
Higher Performers
Lower Performers
Airlines
Banking
Beverages
Office Equip. & Computers
Food
Oil
Food & Drug Retailing
Other Retailing
Savings & Loan
Textiles
Mean
Industry

Fig. 30

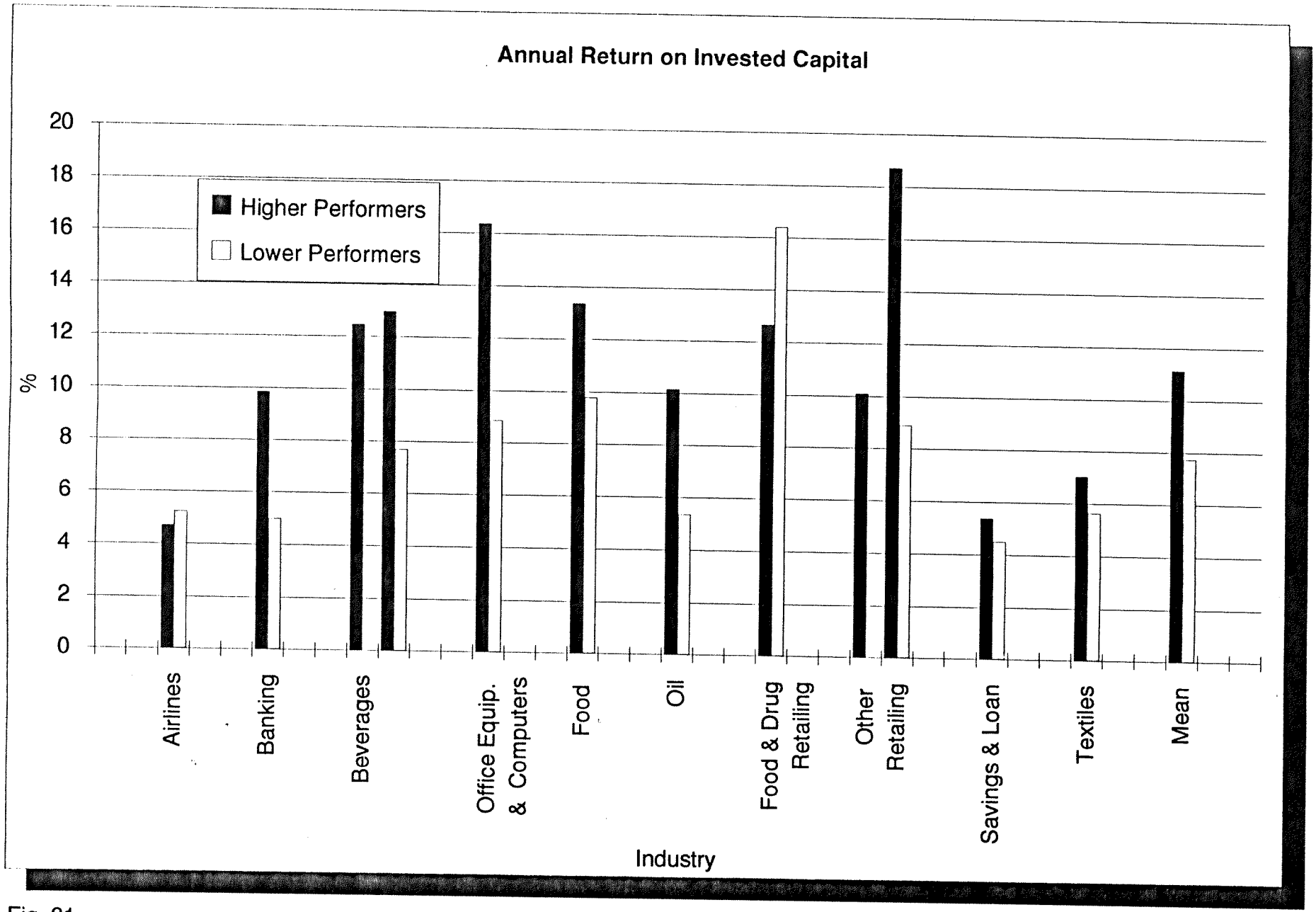

Annual Return on Invested Capital
20
18
16
14
12
10
8
6
4
2
0
%
Higher Performers
Lower Performers
Airlines
Banking
Beverages
Office Equip. & Computers
Food
Oil
Food & Drug Retailing
Other Retailing
Savings & Loan
Textiles
Mean
Industry

Fig. 31

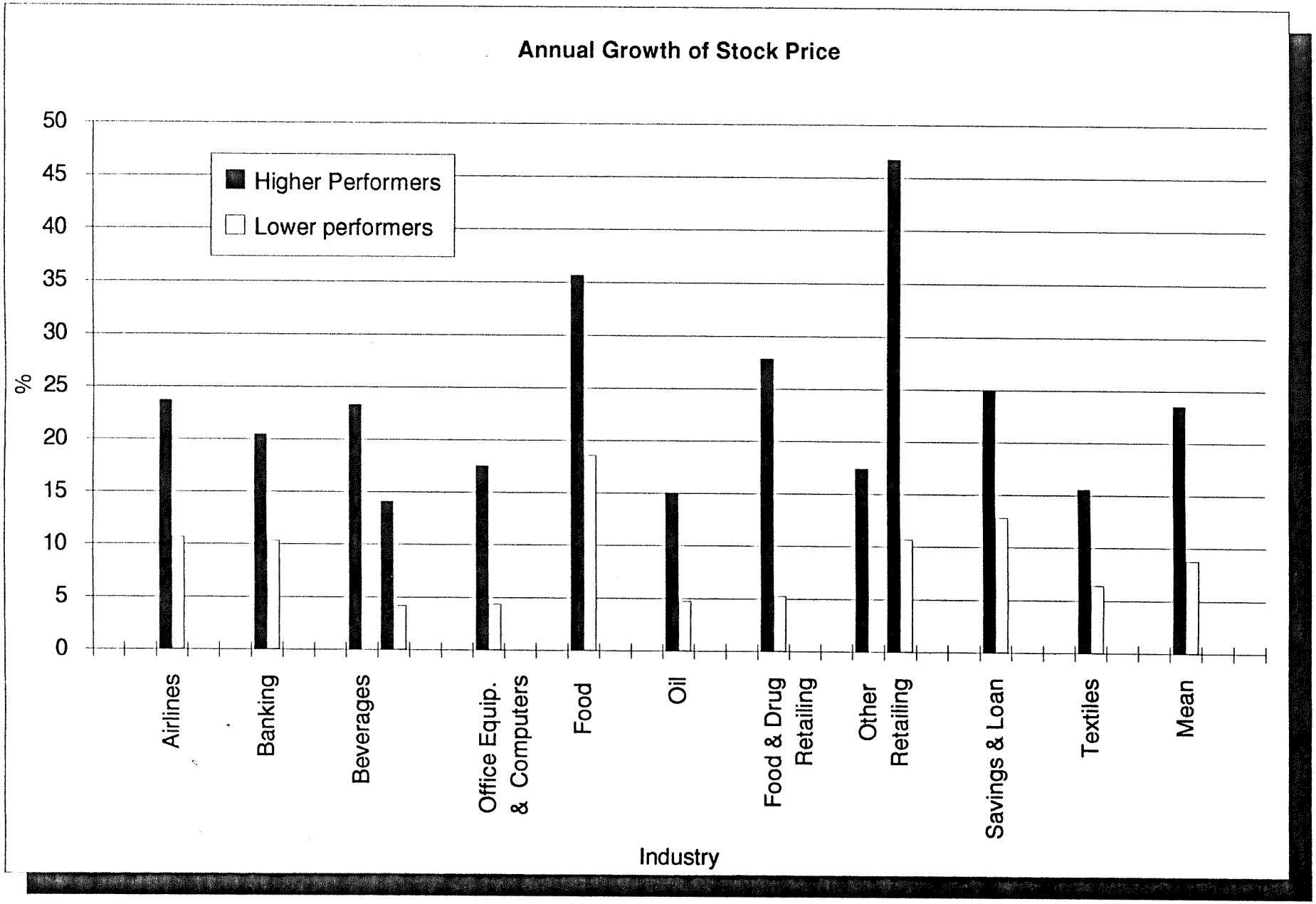

Annual Growth of Stock Price
Higher Performers
Lower performers
%
50
45
40
35
30
25
20
15
10
5
0
Airlines
Banking
Beverages
Office Equip. & Computers
Food
Oil
Food & Drug Retailing
Other Retailing
Savings & Loan
Textiles
Mean
Industry

Fig. 32

Organizational Culture - Performance Enhancing vs. Problem- and Financial Performance Indicators

	Average of 12 Companies With Performance Enhancing Cultures	Average of 20 Companies With "Problem" Cultures
Revenues	+ 682 %	+ 166 %
Work Force Growth	+ 280 %	+ 36 %
Stock Prices	+ 901 %	+ 74 %
Net Income	+ 756 %	+ 1

Over an 11 Yr. Period

Source: Kotter, John P. & James L. Heskett
"Corporate Culture & Performance" (Free Press 1992)

Fig. 33

An Example of the Effect of Corporate Renewal on Organizational Performance *

- Profit: +305%
- Sales: +104%
- Scrap as a Percent of Sales: 9.2% to 2.8%
- Gross Inventory as a Percent of Sales: 68.2% to 37.5%
- Value Added sales per Employee: $52,000 to $75,000
- Product Reliability (MTBF): 7,000 Hrs. vs. 2,000 Hrs. for Competition

* Over a Four Period

Fig. 34

Source: Beer, Michael; Russel A. Eisenstat & Bert Spector
"The critical Path to Corporate Renewal"
(Harvard Bussiness School Press, 1990)

Appendix C -- Company X Case Study

Three attempts to achieve localized organizational change for the purpose of improving the new product development process.

Company Profile and Background Information

Company X is a sixty year old electrical equipment manufacturing company presently employing 1,600 people. It was founded by two partners and run by them for approximately forty years at which time such responsibility was turned over to one each of their children. The company continued to be owned and actively managed by the founders heirs for the next twenty years; until approximately 1987. During this twenty year period, growth was rapid; the operation became complex the product line expanded profusely.

In the middle 1980's, with the owners positioning for retirement from active participation, there began a significant change in the executive staff. Some new people were brought in from outside the organization and several other positions were filled by field sales people. Because the person orchestrating the moves had a sales background, all the new positions were filled with sales oriented people.

Corporate and Engineering Restructuring

In 1987 the two owners relinquished the day-to-day management of the operation. A new CEO, vice president of sales, national sales manager, director of corporate marketing, vice president of quality management and director of quality were appointed. At the same time the engineering and research departments were restructured. Prior to the restructuring, there existed both a so called research and development department and an engineering design and development department; each with its own vice president. The aforementioned restructuring eliminated the research and development department per se and brought someone in from the outside as vice president of engineering to lead the combined effort of "applied research as needed" and product design and development. The previous two vice presidents were relieved of their responsibilities. One was assigned to the role of an in-house consultant and the other was assigned the task of pursuing special projects relating to the practical application of new technology. It can only be speculated if and

to what extent their compensation was readjusted commensurate with their new role in the organization. The important point is that the design and development effort is now being led and coordinated by someone whose skills and competence is much more suited to the task and that the two ex-vice presidents are in positions more suited to their competence. Also, both seem genuinely more satisfied in their new roles. It is important to note that there was no apparent "loss of face" by these two individuals in this reassignment. If anything there was an increase in respect for and credibility of these two individuals now in positions which more closely match their area of skill level and contribution.

One of the major objectives of the engineering department restructuring was to increase productivity of the department; to get new products out of the development lab and available for sale sooner. Excessive development time, cost overruns, traumatic initial production runs and low reliability of the product had been the norm prior to this time. In addition to the executive level changes, it was determined that still more needed to be done to enhance the company's competitive position from a product stand point. In the three years which followed, three different approaches at improved new product development were tried:

- **consultant directed change**
- **executive directed change**
- **empowered employee directed change**

Consultant Directed Change

When Company X was suffering major losses due to warranty claims on a recently redesigned family of product, a consultant group was hired to restructure the area in which the product was manufactured and also the method of development for future products of this nature. The product was originally manufactured in a very segmented and disjointed manner. The product required a diverse assortment of manufacturing processes in its various internal subassemblies and also its final assembly. The metalworking processes and component assembly activities were performed in centralized areas throughout the plant with the final assembly taking place on a moving conveyor line. Only a small fraction of all the people involved in the manufacture of this product actually saw it in its completed form. Most of those involved had no idea what it was, what it was used for and who the final customer was

who bought such a product. There was a tremendous amount of non value added activity in this product in shuffling the parts and pieces back and forth within the plant. There also was little to no awareness of nor concern for the internal customer. The quality of the parts and subassemblies was therefore very poor as was the final product. To establish what was supposed to be an autonomous activity group, the manufacturing processes were centralized and restructured into a cellular arrangement. Manufacturing team members were recruited, trained and cross trained to become familiar with all aspects of the product and what was needed to insure customer satisfaction both internal and external. Team members were given the latitude to identify and resolve problems and to allocate time toward improvement and prevention of future problems.

Results of this effort have been encouraging; product quality has improved dramatically while associated quality costs have decreased proportionally. Also manufacturing costs are down and the gross profit margin has improved. On the other hand, significant animosity exists in most areas by those not included in this experiment. This can be attributed to the following:

- the hired consultants had free access to any and all resources which previously had not been accessible to employees
- the consultant group dominated the analysis and restructuring process rather than working through and with employees
- the consultant group emerged the hero by presenting the problems which had been known all along by those performing the activities
- team member recruitment was done in such a manner as to convey an elitist aura to those selected to participate and a feeling of inferiority to those who were not
- all attention was focused on this group; the efforts of others performing similarly meaningful yet less publicized change activities outside the group went unnoticed.

As yet this group is an isolated island of manufacturing activity in a sea of conventional processes, unconnected to the rest of the organization. They are only fractionally effective as they could be within their group and not at all effective in interacting with the balance of the organization.

This experiment was conducted in a haphazard manner without an adequate amount of planning and without the needed foundation and integration. The organizational structure had not been adequately constructed nor had the nurturing and supportive environment been created. The overall vision had not been properly established nor had it been communicated adequately. The concept of an autonomous work group is perfectly valid but the embodiment was a piece meal, semi committal approach which resulted in marginal returns.

Executive Directed Change

A second attempt at an intrepreneurial, activity group was tried with the objective of designing, developing and producing a new line of accessories for an existing product family. A group leader was selected by the COO, the team established and a facility remote from the main operation was allocated. The intent was to achieve a radically unique design, development in an unprecedented short amount of time and with a per unit manufacturing cost significantly less than what could be achieved under the existing facility burden rates.

Two years after its formation the group was dissolved and the activity stopped. Achievement of the original objectives was not in the foreseeable future and it seemed pointless to continue. There are numerous reasons for the discouraging results:

- the group leader lacked the skills critical for success -- knowledge of product and process technology, business orientation, communication and interpersonal skills, organization and leadership skills
- the other team members were mostly novices; lacking both the necessary skills and experience
- the Company X executives, after commissioning such an ill-fated venture, failed either to see or to recognize the early warning danger signs and take action while there might still have been time to salvage the effort.

People Empowered Change

In yet another effort, attempts at more effective new product development are being tried. Historically, all aspects of the development of a new product had been done by a single engineer working in virtual isolation of his peers and of people in other functions. Development was invariably myopic; products met with mediocre success

being technology versus customer oriented; they were difficult and costly to manufacture; of low durability and reliability; the development time was excessively long and the target cost was exceeded almost without exception.

To improve the development process, one engineering manager championed the use of multi-functional development teams operating in a concurrent fashion rather than the previous sequential manner. Some new products developed under this concept were brought to market in significantly less time than what was previously possible.

While there were some localized successes with this new concurrent approach, the overall impact on the organization was minimal. The culture and structure of the organization had not significantly been altered to support this different product development process. Non-engineering members of the development team were still accountable to their functional manager rather than the team objectives; participation on the team was a secondary activity rather than a prime focus. The team did not have a proper team leader but relied on the development engineer, product manager or engineering manager. The team did not have true autonomy but was still subjected to the usual amount of executive level interference and politics. And for the most part the teams did not have the proper direction, training or support. Essentially, the team was operating under valid principles but was not operating within a supportive environment and structure.

A More Integrated, Comprehensive Approach

A refinement to the first attempt at a new product introduction process is presently being tried. The initiative to do so and the effort to date being led by the same engineering manager who had previously pioneered concurrent development. This renewed and refined activity was started after a traumatic development-to-production transition of a new product; the same product having had many problems within the development phase. To determine what the development-to-production transition problems were, those closet to the activity -- the production people, were asked their opinion of the situation. Their perception of the problem included such items as: inadequate training, no time allowed for improvement, poor engineering-manufacturing relationships and lack of upper management commitment and support.

Because the source of the problem appeared to be so far reaching -- far beyond the production area, a task force was assembled to study the situation in more detail and to formulate a proposal for its solution. This task force was led by the same change initiating champion and functioned very much as an autonomous activity group. Because problems existed in every facet of the product development process, from concept, through engineering design and development and into manufacturing; the group gave itself the name **Concept to Customer** task force. It had representation from sales, quality management, purchasing, marketing, manufacturing and engineering. The team established a charter which defined its mission and also a plan to carry out the mission. (Table A-1.) Essentially the approach was to do a situational analysis, brainstorm a realistic solution for improvement and formulate a proposal to present to the executive committee of the company.

The analysis phase consisted of team members asking people from their respective function what barriers to the effective achievement of their jobs presently existed. Asking people what impediments exist which hinder or prevent them from performing their function and from best contributing to the success of the organization was basically internal market research.

After the task force members interviewed their respective groups, the perceived problems from all functions were then collated to achieve a more cohesive overall view of the situation. The following key problems were identified:

- more **long term vision and planning** is required at the executive level
- more **commitment, focus and discipline** is needed to achieve organizational objectives
- a **better overall system is required** to accommodate the development process; specifically the transition into production.

Brainstorming was then done by the task force to arrive at a method to achieve the desired results. To meet the objectives as stated in the task force charter it was determined that a major structure/process change was required. It was also determined that the ultimate structure and environment probably would not be accepted by nor be possible with the existing executive group. A proposal was then formulated which would result in the most significant change deemed possible within a reasonable amount of time and with existing upper management personnel.

Redefining Roles and Responsibilities

The company previously had two committees to guide the selection and prioritization of new product development projects. These committees had representatives from various functions and tended to be functionally rather than objective oriented. A **New Product Liaison** Committee consisted of middle managers and supervisors associated with a particular product line. The purpose of this group was to explore the requests for and possibilities of new products within the respective line and propose to the **Strategy Committee** which new developments to pursue. The strategy committee consisted of directors and vice presidents and was supposed to review the proposals of the liaison committees and decide which course of action would be taken and what the priorities should be.

The system functioned poorly due to the following:

- there was **no clearly defined company mission and strategy** as a reference for the product liaison committees to base their decisions and recommended action
- there was **no distinct responsibility nor authority** assigned to the liaison group and **no corresponding accountability**
- there was **little recognition and support** of the Liaison Group by the strategy or executive committee; rather there was continued hierarchal usurping of and interference in the decisions made by the liaison committees
- there was **no sense of ownership** between involvement in the liaison committee and responsibility to the organization or to the product line.

The proposal by the Concept to Customer task force was to make the three existing groups; strategy committee, liaison committee and development groups more effective by giving them empowerment, insisting on accountability and shifting from a functional, adversarial orientation to one of integrated teamwork and mutual support. It was determined that some of the elements of what was required were already in place; what was needed was a reorientation and re-focus. This reorientation needed to start at the executive level and be manifested in the active and effective executive participation in the existing Strategy Committee. To differentiate the new orientation from the old it was suggested this group change its name to **Marketing Strategy Group**. For similar reasons it was suggested that the product liaison group be called the **Product Advisory Group**.

To provide the needed support, guidance and direction, it was felt that the Marketing Strategy Group needed to review the company mission and strategy, redefine it if necessary and make sure it was known and understood by all. The Product Advisory Group would then base proposals for recommended courses of action on this mission and strategy. If a new product proposal was accepted by the Marketing Strategy Group, a development activity group would be commissioned to carry out the concept to customer activities for the particular project. Simply stated, the Product Advisory Group would be responsible for making sound business decisions supportive of the corporate strategy and would be held accountable for results. Once a new product development proposal was accepted, the core members of the development team and the team leader or project manager would be selected. The Product Advisory Group, in conjunction with the core development team would then detail the product requirements, determine needed resources, establish a schedule, do a financial analysis and make a physical model of the proposed product. The product and personnel requirements, along with a schedule, development cost budget and product model would be presented to the Marketing Strategy Group for approval to continue. Upon acceptance of the product in this concept form, responsibility for development would then be turned over to the project manager and the development team. This core team would be accountable for the product, the schedule and its projected cost and would make periodic progress reports directly to the Marketing Strategy Group. During the Concept to Customer process the Product Advisory Group would advise and counsel the development team but would not function in a supervisory capacity. (Figure A-1).

Redefining the New Product Development Process

In the problem analysis stage, the Concept to Customer task force determined that there were three Concept to Customer phases which needed improving: **concept** phase, **development** phase and initial **manufacturing** phase. Not only were there problems within these phases but the two transitions from concept to development and from development to production were also difficult and in need of similar improvement.

It was determined that the concept phase of a new product needed more active and accountable participation of the Product Advisory Group under the leadership of the Product Manager. The definition of the new product in this phase needed to be

oriented toward the benefit to the customer and to the competitiveness and profitability of the organization rather than to the benefit to any function or individual.

To have a more accountable development team it was felt the horizon of this group must be extended. Their involvement needed to begin in the concept stage to establish the necessary feeling of ownership. Involvement and accountability also needed to extend into the production phase to ensure suitability for manufacturing and to complete the vendor/customer link. (Figure A-2.)

The proposal of the Concept to Customer task force to upper management also recommended that a Program Administrator (PA) be appointed to do the coordination and orchestration of all that was needed to achieve the changes as indicated in the proposal. Essentially the PA would be responsible for implementation of this new process and the reorientation of the organizational mindset toward new product development -- from one of segmentation and functional orientation to one of integration and objective orientation. The PA would be the new Concept to Customer process champion. It was determined that this position be temporary -- that the objective of the job be to "work yourself out of a job". It was felt that, like quality, this new process must become standard operating procedure and as such, once established, needed no one to enforce it. If this process were properly implemented in the properly structured organization having the necessary leadership, the process would be self maintaining and self improving. It was intended that the PA work with the task force to get up to speed on the details of the proposed plan and work together to modify it as deemed necessary. The PA would then assume responsibility for the new program and would lead a Phase II task force to detail the plan, work out the logistics and implement it. In order to have it stand a reasonable chance of acceptance, the proposal of the Concept to Customer to the executive committee was made as being a significant change to an existing system rather than a radical change to something presently unknown. (Table A-2.) Also, major benefits to the organization and to individuals were pointed out. (Table A-3.)

Presentation of Proposed Changes

The proposal of the Concept to Customer task force was made to the Company X executives and reaction was generally favorable and enthusiastic. The one owner

who was present at the presentation was, however, skeptical that any change was needed let alone anything which appeared to be this major.

Phase II of the plan was to begin with the appointment of a Program Administrator followed by the appropriate details and implementation schedule. There was much discussion as to whether or not this Program Administrator should be hired from the outside or from within the organization. Due to the state of the general economy and that of the company at the time, and also due to the temporary nature of the position, it was decided to hire from within. The Concept to Customer task force worked with an executive staff person to select candidates for this position and conduct preliminary interviews. A detailed job description was established and the candidates were informed that this would be a temporary position.

It was thought that the personal growth experienced and the knowledge gained while administering this program would make the candidate a more valued employee and better able to assume a broader role in the future. The candidates were told that hopefully there would be other assignments of this nature available for them in the future but at an absolute minimum their old position would be available to them when this assignment was finished. During the preliminary interview both candidates expressed concern with the degree of commitment to this program by the company's executive staff and doubt as to whether or not any position would be open to them after the completion of this assignment.

Final interviews were scheduled with the CEO and vice presidents of marketing, engineering and manufacturing for the purpose of answering questions either party might have and giving the candidates the support they were seeking. The interviews went badly with the executives demonstrating indecision, lack of cohesion and lack of commitment. Because of this and due to continuing concerns about the economy it was determined to forgo the Program Administrator approach to process implementation. Instead it was decided to have the Concept to Customer task force leader (an engineering manager) be the project leader for a prototype development effort. This person would not only establish a development group as previously described but would also detail and document the new process as the activity progressed. This project leader would regularly report the status of both the product and the process to the Marketing Strategy Group.

Implementation of the Concept

The new product being developed with the Concept to Customer process is in the concept phase with information being collected to establish detailed and comprehensive product requirements. The core team members have been selected and the project associates identified. Team orientation on the development project and also the new concept to customer process has taken place. While still in the initial phase of both the product and process, the approach being taken is significantly better than anything which has preceded it and shows corresponding chances for success. The lack of a Program Administrator could however impede the spread of this type of an approach throughout the organization. It remains to be seen what steps might be taken by upper management to support this type of activity group orientation and ensure its use throughout the organization.

Results of Various Methods of Achieving Change

In this company, all three methods of change have been tried; **executive directed**, **consultants** and **people empowered**. Of the three approaches taken, people empowered activity centers has shown the most potential of achieving the greatest amount of positive change with the least amount of capital expenditure and organizational trauma. Being representative of the average, conventionally structured, medium-sized manufacturing company, some form of people empowered activity center approach to greater effectiveness appears to be viable for any organization of this nature.

Implementation and success of an activity centered structure is predicated on owner/CEO/executive acceptance and support. This entails a willingness to relinquish hierarchal control and accept responsibility to provide the necessary vision and leadership for those able to coordinate their own activities.

Of the three organizational impediments to the new product development initially identified by the Concept to Customer task force, one is being addressed and two still need to be resolved. The major problems were lack of vision and planning at the executive level; corresponding commitment, focus and discipline in achieving objectives and a better system of getting new products to the market. The Concept to Customer process of initializing, developing and manufacturing new products is underway and appears to be working. There is still, however, inadequate upper level

leadership and cohesion. In spite of the diligent efforts of conscientious, skilled and knowledgeable people at all levels of the organization, Company X has an increasingly difficult time of staying ahead of the competition. Each function and individuals within the functions are all very busy doing what is felt needs to be done. There are many local improvement programs -- tools being tried in various areas of Company X but the net effect is marginally noticeable. The problem is that the various functions are not performing their activities in harmony toward clearly defined objectives. This lack of effective resource utilization is finally becoming apparent to the executive staff. The CEO is beginning to realize that the lack of a corporate strategy and lack of communication, cooperation and leadership in the executive ranks is affecting the performance of the entire organization. Perhaps it will also be realized that it is the lack of this foundation which is causing efforts to be segmented and disjointed and preventing them from achieving their desired results.

Project Charter: Increase competitiveness via more efficient new product concept-to-market techniques

Objectives:

- shorten time from concept to availability for sales
- have total manufactured cost be low enough for competitive pricing and adequate profitability
- increased reliability; decreased quality costs
- easy transition of product from development to manufacture to customer
- better match of product to customer needs
- communication, cooperation and team orientation, between functions

Approach:

- situational analysis
- brainstorming
- proposal

Task Force Representatives

- Sales
- Quality Management
- Purchasing
- Mfg. Business Team
- Marketing
- Engineering
- Manufacturing

CONCEPT TO CUSTOMER TASK FORCE CHARTER

Table A-1

- More executive level involvement -- more active role in the new product process
  - awareness/communication
  - direction/guidance
  - commitment
  - support
- More responsible resource groups
  - advisors to executive level facilitators and Project Team
  - formulate product strategy supportive of corporate strategy
- More effective development teams
  - empowered, accountable
  - cohesive; task vs. functional orientation
- A better system to support the new product concept to customer process
  - better product definition
  - realistic resource planning and allocation
  - more discipline/accountability throughout
  - individual training for new role
- Program administrator to get it started, keep it running and insure continuous improvement
- *Essentially a major rejuvenation of an existing system!*

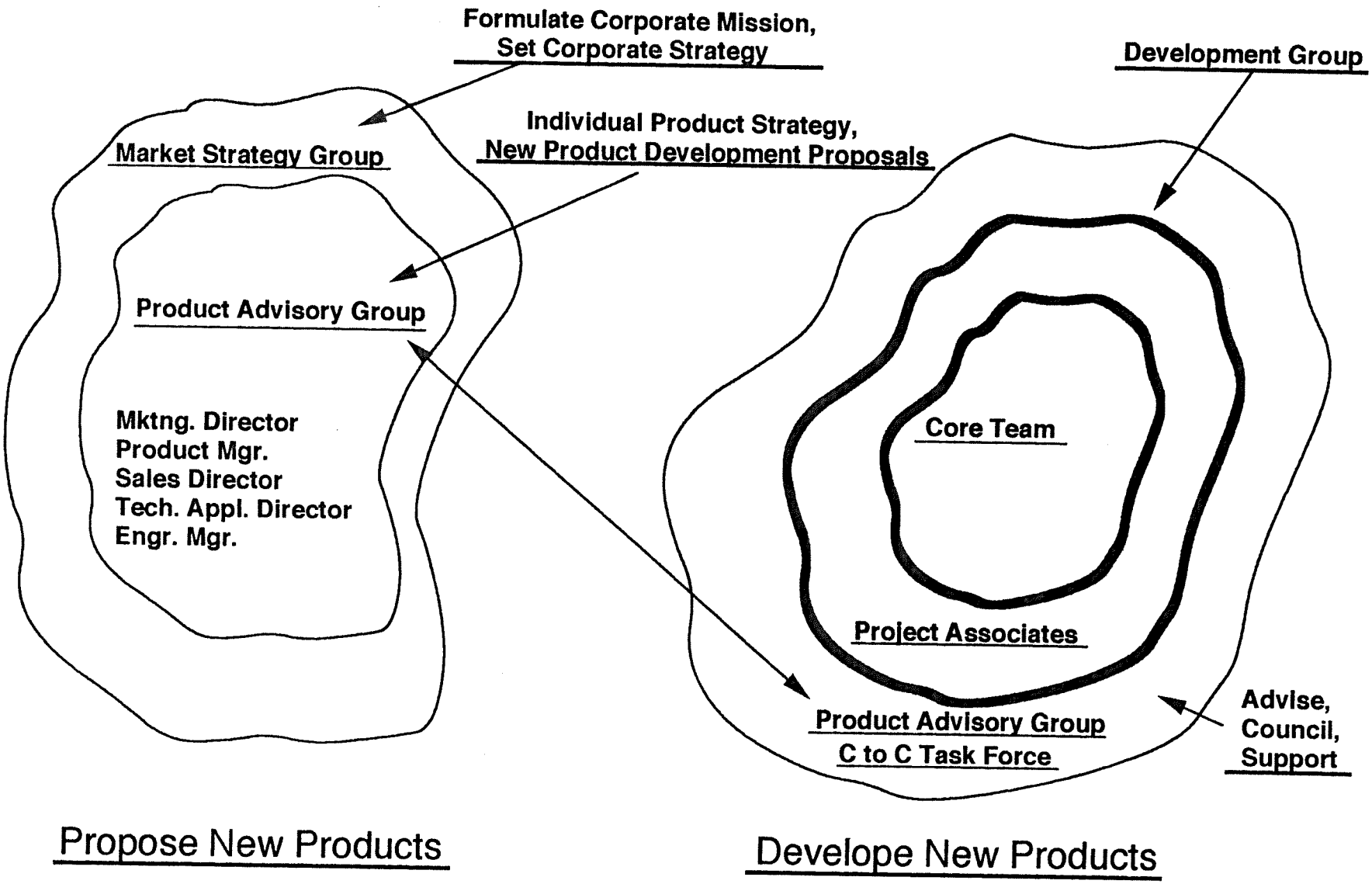
A NEW APPROACH TO PRODUCT DEVELOPMENT

Table A-2

- Greater ***Definition***
  - product requirements
  - production process and procedure
  - individual and group responsibilities
- Greater individual and group ***Accountability***
- Organizational ***Focus*** and ***Unity***
- ***Team*** vs. functional ***Orientation*** at all levels
- Enhanced ***Communcation***: up, down, across and throughout
- Improved ***Resource Utilization***, more productive, greater value added activity
- Individual ***Growth*** and increased ***Worth***
- ***Quantified*** performance
- Continuous ***Improvement***
- ***Empowered*** individuals at all levels

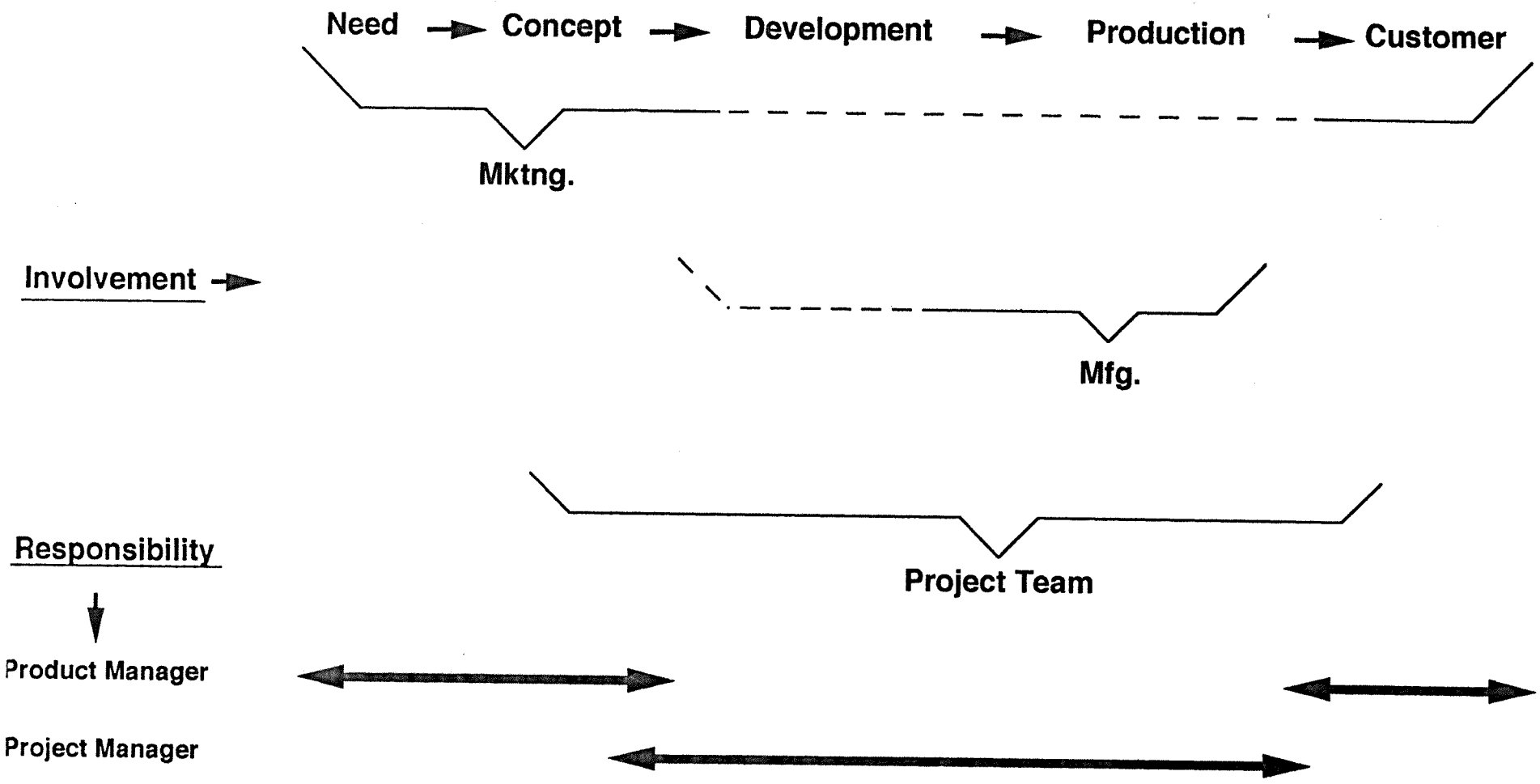
BENEFITS OF EMPOWERED ACTIVITY GROUPS

Table A-3



New Product Activity Relationships

Fig. A-1



Concept to Customer Process
Involvment / Accountability

Fig. A-2