

**BEYOND HIERARCHIES : EMERGING ORGANIZATIONAL
STRUCTURES THAT ARE NON-HIERARCHICAL**

MBA THESIS

**Gürhan Karpuzoğlu
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A THESIS

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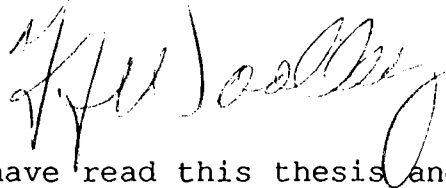
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ABSTRACT

**BEYOND HIERARCHIES : EMERGING ORGANIZATIONAL
STRUCTURES THAT ARE NON-HIERARCHICAL**

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SEPTEMBER, 1995

Organizational structures are facing dramatic changes. Hierarchical structures are becoming inefficient while non hierarchical ones are gaining in importance. This study examines the shift from hierarchical to non-hierarchical structures, and presents organizational design alternatives and conceptual tools necessary for the implementation of non-hierarchical designs.

Keywords: Hierarchy, self-management, learning, network,
process-based organization.

ÖZET

HİYERARŞİLERİN ÖTESİ : ORTAYA ÇIKAN HİYERARŞİK OLMAYAN
YAPILAR

GÜRHAN KARPUZOĞLU

TEZ DANIŞMANI:DR. FRED WOOLEY

EYLÜL, 1995

Organizasyonel yapılar köklü değişikliklerle karşı karşıyalar. Hiyerarşik yapılar verimsiz bir hale gelirken, hiyerarşik olmayan yapılar önem kazanmaktalar. Bu çalışma, bu süreci incelemekte, alternatif organizasyonel yapılar ve bu yapıların uygulanabilmesi için gerekli kavramsal araçlar sunmaktadır.

Anahtar Kelimeler: Hiyerarşi, kendi kendini yönetim, öğrenme, ağ, süreç tabanlı organizasyon.

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1. INTRODUCTION

The design of a system involves consideration of its structure, the way it is organized. The way it is organized greatly affects an organization's ability to learn and adapt, hence develop. Just as an individual's learning and adaptations require an ability to change one's behavior so it is in organizations. The idealized design should consider how to structure a system to ensure that it is ready, willing and able to modify itself when necessary in order to make progress toward its ideals.

In general, an organization's structure is characterized by the way work is divided (how responsibilities are assigned) and how these separate activities are coordinated and integrated (how authority is allocated)¹.

Conventional structures are hierarchical and are represented in the familiar tree-like diagrams consisting of boxes and connecting lines. The boxes show who has responsibility for what and the lines show who has authority over whom. In today's turbulent environmental changes these structures require frequent modification. Unfortunately, it is impossible to modify a hierarchical structure fast enough to cope with increasing demands of the environment.

1. Ackoff, R.R., *Redesigning the Future*, New York: Wiley, 1974.

Environments in which drastic changes occur quite often bring uncertainty to organizations. Hierarchies are not the types of organizations that can cope with uncertainty. Jay Galbraith has given attention to the relationship between uncertainty, information processing and organization design². Uncertain tasks require greater amount of information to be processed by decision makers during task performances. The greater the uncertainty, the more difficult it is to program and routinize activity by preplanning a response. This helps explain why organizations in different task situations place different kinds of emphasis on rules and programs, hierarchy, and goals and targets as a means of integrating and controlling activity.

As uncertainty increases, organizations typically find ways of controlling outputs (e.g., by setting goals and targets) rather than controlling behaviors (e.g., through rules and programs). Hierarchies are an effective means for controlling situations that are fairly certain, but in uncertain situations they can encounter information and decision overload. The information processing perspective thus provides a means of accounting for differences between mechanistic and more organic forms of organization. The mechanistic types are based on information and decision making systems that are highly programmed and preplanned, and organic types are typ-

2. Morgan, G., *Images of Organization*, Sage Publications Inc., 1986.

ically based on processes which are more flexible and more ad-hoc. In organic organizations greater scope is created for discretion and judgement, and more reliance is placed on feedback rather than on programming as a means of control.

This paper investigates selected conceptualizations of organic forms of organizations and current practices that are deviating from hierarchical structures.

First, a brief explanation of what is understood by hierarchical organizations is presented.

Second, a discussion concerning the opening of a new era in organizational studies will be presented. The discussion focuses on the inevitable end of the job as we know it, and links the phenomenon to the increased rate of change in organizational structure.

Third, concepts of self management and learning organizations are presented as essential tools of building non-hierarchical organizations that can cope with changing environments.

Fourth, structural forms that enable self management and learning in organizations are presented. These are network structures, process-based organizations, and spherical struc-

ture.

Finally, the circular organization is presented as a hierarchical form that allows participation.

2. HIERARCHICAL ORGANIZATIONS

It is strongly believed that hierarchy is not the best way of organizing given the increased rate of change in the environmental circumstances. This point will be clearer after the following presentation of the characteristics of hierarchical organizations.

From time to time hierarchy and bureaucracy may be used interchangeably. Although the two words have different meanings they will refer to the principles listed below which are a summary of general principles of classical management theory³:

Unity of command: an employee should receive orders from only one superior.

Scalar chain: the line of authority from superior to subordinate, which runs from top to bottom of the organization; this chain, which results from the unity-of-command principle, should be used as a channel for communication and decision making.

Span of control: the number of people reporting to one superior must not be so large that it creates problems of communication and coordination.

Staff and line: staff personnel can provide val-

3. Ibid, p.26.

uable advisory services, but must be careful not to violate line authority.

Division of work: management should aim to achieve a degree of specialization designed to achieve the goal of the organization in an efficient manner.

Authority and responsibility: attention should be paid to the right to give orders and to exact obedience; an appropriate balance between authority and responsibility should be achieved. It is meaningless to make someone responsible for work if they are not given appropriate authority to execute that responsibility.

Centralization (of authority): always present in some degree, this must vary to optimize the use of faculties of personnel.

Discipline: obedience, application, energy, behavior, and outward marks of respect in accordance with agreed rules and customs.

Equity: based on kindness and justice, to encourage personnel in their duties; and fair remuneration which encourages morale yet does not lead to overpayment.

Stability of tenure of personnel: to facilitate the development of abilities.

These principles, many of which were first used by Frederick the Great and other military experts to develop armies into "military machines", provided the foundation of management theory in the first half of this century. And their use is very widespread today.

These principles indicate that bureaucratic organizations have high degree of complexity, formalization and centralization.

Complexity refers to the degree of differentiation that exists within an organization, formalization refers to the degree to which jobs within the organization are standardized and centralization refers to the degree to which decision making is concentrated at a single point in the organization.

Complexity, formalization, and centralization are the defining characteristics of hierarchical organizations. In the next part a new type of environment will be presented where jobs, with rigid definitions, are no longer at the center of organizations. It will be shown that traditional hierarchies, as defined here, are becoming ineffective and inefficient.

3. END OF JOB

Bureaucratic organizations by their very nature have a high degree of formalization. Formalization refers to the degree to which jobs within the organization are standardized. A recent article from Fortune magazine projected the ultimate end of the job as we presently know it. An excerpt from that article is presented below ⁴:

Our organizational world is no longer a pattern of jobs, the way a honeycomb is a pattern of those little hexagonal pockets of honey. In place of jobs, there are part-time and temporary work situations. That change is symptomatic of a deeper change that is subtler but more profound. The deeper change is this: Today's organization is rapidly being transformed from a structure built out of jobs into a field of work needing to be done.

Jobs are artificial units superimposed on this field. They are patches of responsibility that, together, are supposed to cover the work that hers is to take care of that, and yours is to take care of the other thing. Together you usually get the work

4. Fortune Article by William Bridges, "The End of the Job", Fortune, September 19, 1994.

done, though there are always scraps and pieces of work that don't quite fall into anyone's job description, and over time job responsibilities have to be adjusted and new jobs added to keep getting everything done.

When the economy was changing much more slowly, the discrepancies between the job matrix and the work field could be forgotten. If new technology opened up a new area in the work field, new jobs could be created to cover the new work that needed doing. If a new market opened up, new jobs could be created to serve it. If a new law or judicial ruling required an organization to do something different, new jobs could be created to take care of the situation.

But in a fast-moving economy, jobs are rigid solutions to an elastic problem. We can rewrite a person's job description occasionally, but not every week. When the work that needs doing changes constantly, we cannot afford the inflexibility that the job brings with it. Further, at a time when competitive organizations must reduce head count, jobs-those boxes on the organization chart, with regular duties, hours, and salaries-encourage hir-

ing. They do this by cutting work up into "turfs," which in turn require more turfs (and more hiring) whenever a new area opens up. They encourage additional hiring by giving managers a level of power commensurate with the number of turf areas for which they are responsible: The more areas, the more power. Jobs also discourage accountability because they reward people not for getting the necessary work done but for "doing their jobs."

Jobs are no longer socially adaptive. That is why they are going the way of the dinosaur.

If hierarchies will no longer be the basis of organizations then what is going to replace them? This is an important question, but it is not difficult to see the answer. If centralization, formalization and complexity are properties of hierarchical organizations then decentralized, nonformal and organizations with low levels of complexity are what one can expect in the future.

Future organizations will be decentralized, authority will be delegated to lower levels or there will not be lower levels but authority will be shared by the units in the organizations. At this point self management becomes important in order to run a decentralized organization.

There will be less formalization. Rules and regulations will no more act as guidelines to be followed. Organizations will learn to operate without formal rules. They will produce their informal rules and change these rules when necessary. Simply, they will become learning organizations.

Future organizations will be much simpler than current bureaucratic giants.

In the next section self management and organizational learning will be presented as conceptual tools for creating organizations that are non hierarchical. It is not possible to have decentralized organizations without self managing capabilities. Also organizational learning capabilities will replace formalization in the organizations.

After the presentation of self management and organizational learning, the structural forms that enable operationalization of these two concepts will be presented.

4. CONCEPTUAL TOOLS FOR BUILDING NON-HIERARCHICAL ORGANIZATIONS

4.1. SELF MANAGEMENT: THE BRAIN METAPHOR

In the search for new organizational forms that are not hierarchical, Gareth Morgan offers a metaphor which raises intriguing questions about the possibility of organizations with high levels of flexibility. Morgan's metaphor is the brain. His ideas are based on the observations of G.R. Taylor, in his book *The Natural History of the Mind*, from which, the following excerpt is presented⁵:

In a famous experiment, the American psychologist Karl Lashley removed increasing quantities of the brains of rats which had been taught to run in a maze. He found that, provided he did not remove the visual cortex and thus blind them, he could remove up to ninety percent of their cortex without significant deterioration in their power to thread their way through the maze. There is no man-made machine of which this is true. Try removing nine-tenths of your radio and see if it still brings in a signal! It would seem that each

5. Morgan, p.77.

specific memory is distributed in some way over the brain as a whole.

Similarly, you can remove considerable amounts of the motor cortex without paralyzing any one group of muscles. All that happens is a general deterioration of motor performance. The evolutionary advantages of such an arrangement are manifest: when pursued, it is better to run clumsily than not at all. But how this remarkable distribution of function is achieved we do not really understand. We see, at all events, that the brain relies on patterns of increasing refinement and not (as man-made machines do) on chains of cause and effect.

The question here is whether it is possible to create organizations that can function like a brain and that have high levels of flexibility.

The brain has been compared to a holographic system, invented in 1948 by Dennis Gabor, which uses a lenseless camera to record information in a way that stores the whole in all the parts⁶. Interacting beams of light create an "interference

6. *Ibid.*, p.80.

pattern" that scatters the information being recorded on a photographic plate, known as hologram, which can then be illuminated to recreate the original information⁷. One of the most interesting features of the hologram is that if it is broken the entire image can be reconstructed from a small piece.

In a holographic system the whole is encoded in the parts. Neuroscientist Karl Pribram of Stanford University has suggested that the brain functions in accordance with holographic principles: that memory is distributed throughout the brain and can thus be reconstituted from any of the parts⁸. This explains why the rats in Karl Lashley's experiments were able to function reasonably well even when major portions of their brain had been removed.

It is possible to extend the holographic image to create a vision of an organization where capacities required in the whole are enfolded in the parts, allowing the system to learn and self organize and to maintain a complete system of functioning even when specific parts malfunction or are even removed.

7. *Ibid*, p.80.

8. *Ibid*, p.80.

The holographic character of the brain is most clearly reflected in the patterns of connectivity through which each neuron (nerve cell) is connected with hundreds of thousands of others, allowing a system of functioning that is both generalized and specialized⁹.

"Different regions of the brain seem to specialize in different activities, but the control and execution of specific behaviors is by no means as localized as was once thought while we can distinguish between the functions performed by the cortex (the master planner which controls all non-routine activity and perhaps memory), the cerebellum (the computer or automatic pilot taking care of routine activity), and the midbrain (the center of feelings, smell and emotion), we are obliged to recognize that they are closely interdependent and capable of acting on behalf of each other when necessary. The principle of connectivity and generalized function is also reflected in the way neurons serve both as communication channels and as a locus of specific activity or memory recall. It is believed that each neuron may be as complex as a small computer and capable of

9. *Ibid*, p.95.

storing vast amounts of informations. The pattern of rich connectivity between neurons allows simultaneous processing of information in different parts of the brain, a receptivity to different kinds of information at one and the same time, and an amazing capacity to be aware of what is going on elsewhere." ¹⁰

Such high level of connectivity creates a redundancy but this redundancy is crucial in creating an excess capacity that allows new activities and functions to develop. It facilitates the process of self organization whereby new functions can evolve along with changing circumstances.

"The brain has this amazing capacity to organize and reorganize itself to deal with the contingencies it faces. Experiments have shown that the more we engage in a specific activity, e.g. playing tennis, typing or reading, the more the brain adjusts itself to facilitate the kind of functioning required. The simple idea that "prac-

10. *Ibid*, p.95.

tice makes perfect" is underwritten by a complex capacity for self organization whereby the brain revises patterns of neuronc activity. For example, experiments where monkeys were trained to use a finger to press a lever thousands of times a day showed that the area of the brain controlling that finger increased in size and changed in organization. Our awareness leads us to see the brain as a system which, in no small measure, has played an important role in designing itself in the course of evolution ." ¹¹

The critical problem is whether organizations that are able to learn and self organize in the same manner of a brain can be created. Gareth Morgen provides a list of what should be done to create holographic organizations¹².

- Get the whole into the parts.
- Create connectivity and redundancy
- Create simultaneous specialization and generalization.
- Create capacity to self organize.

Holographic designs require the implementation of four interrelated principles: Redundancy of functions, learning to

11. *Ibid*, p.97.

12. *Ibid*, p.98.

learn, Requisite variety, Minimum critical specification.

The principle of redundancy of functions shows a means of building wholes into parts by creating redundancy, connectivity and simultaneous specialization and generalization. The principle of requisite variety is concerned with how much of the whole should be built into parts. And the principles of learning to learn and minimum critical specification show how capacities for self organization can be enhanced.

Australian systems theorist Fred Emery has suggested that there are two methods for designing redundancy into a system¹³. The first involves redundancy of parts, where each part is precisely designed to perform a specific function, special parts being added to the system for the purpose of control and to back up or replace operating parts whenever they fail. This design principle is mechanistic, and the result is typically a hierarchical structure where one part is responsible for controlling another.

The second design method incorporates a redundancy of functions. Instead of spare parts being added to a system, extra functions are added to each of the operating parts, so that each part is able to engage in a range of functions rather than just perform a single specialized activity. An example

13. *Ibid*, p.98.

of this design principle is found in organizations employing autonomous workgroups, where members acquire multiple skills so that they are able to perform each other's jobs and substitute for each other as the need arises. At any one time, each member possesses skills that are redundant in the sense that they are not being used for the job at hand. However this organizational design possesses flexibility and a capacity for reorganization within each and every part of the system.

Systems based on redundant functions are holographic in the sense that capacities relevant for the functioning of the whole are built into the parts. Now the question is how much redundancy should be built into a given part. The holographic principle suggests that one should try to build everything into everything else, as in a brain, but this is an impossible ideal for a human system. It is here that the idea of requisite variety becomes important.

"Requisite variety is the principle, originally formulated by the English Cybernetician W.Ross Ashby, that suggests that the internal diversity of any self regulating system must match the variety and complexity of its environment if it is to deal with the challenges posed by that environment"¹⁴. Or to put the matter slightly differently, any control

14. *Ibid*, p.100.

system must be as varied and complex as the environment it controls. In the context of holographic design this means that all elements of an organization should embody the critical dimensions of the environment within which they have to function, so that they can self organize to cope with the demands they are likely to face.

Unlike the brain, in human organizations it is impossible for a single person to possess all the skills necessary to cope with the environment. In other words a single person cannot have total requisite variety. In order to build requisite variety in human organizations responsibilities can be given to teams and the team with its many people can reach to a considerable degree of requisite variety.

Requisite variety enables a system to have a proactive embracing of the environment in all its diversity. The systems with requisite variety are proactive because of their redundant functions.

The principles of redundancy of functions and requisite variety enables to systems to build a capacity to self organize. In order to realize this capacity and assume coherent directions two other principles are necessary. These are: Minimum critical specification and learning to learn.

The principle of minimum critical specification reverses

the bureaucratic principle that organizational arrangements need to be defined as clearly and as precisely as possible. For in attempting to organize in this way one eliminates the capacity for self organization¹⁵. The principle of minimum critical specification suggests that managers and organizational designers should primarily adopt a facilitating or orchestrating role, creating "enabling conditions" that allow a system to find its own form. One of the advantages of principle of redundant functions is that it creates a great deal of internal flexibility. The more one attempts to specify or pre-design what should occur, the more one erodes this flexibility. The principle of minimum critical specification attempts to preserve flexibility by suggesting that, in general, one should specify no more than is absolutely necessary for a particular activity to occur.

The principle of minimum critical specification helps preserve the capacity for self organization. The danger of such flexibility is that it has the potential to become chaotic¹⁶. This is why the principle of learning to learn must be developed as a fourth element to holographic design.

15. *Ibid*, p.101.

16. *Ibid*, p.102.

"Cybernetics leads to a theory of communication and learning stressing four key principles. First, that systems must have the capacity to sense, monitor, and scan significant aspects of the environment. Second that they must be able to relate this information to the operating norms that guide system behavior. Third, that they must be able to detect significant deviations from these norms. And fourth, that they must be able to initiate corrective action when discrepancies are detected.

If these four conditions are satisfied, a continuous process of information exchange is created between a system and its environment, allowing the system to monitor changes and initiate appropriate responses. In this way the system can operate in an intelligent self regulating manner. However the learning abilities thus defined are limited in that the system can maintain only the course of action determined by the operating norms or standards guiding it." 17

A distinction between the process of learning and learning to learn has to be made. Those systems that do not

17. *Ibid*, p.86.

have a capacity for learning to learn are unable to question the appropriateness of what they are doing. "The human brain or advanced computers have capacities for learning to learn."¹⁸ They are able to detect and correct errors in operating norms and thus influence the standards that guide their detailed operations. It is this kind of self-questioning ability that underpins the activities of systems that are able to learn and learn to learn and self-organize. A system's capacity for coherent self regulation and control depends on its ability to engage in processes of learning ((single-loop learning) and learning to learn (double loop learning)).

As discussed before, it is very difficult to create decentralized organizations without self management capacity. One of the principles of holographic design was learning to learn. The learning ability of an organization is very crucial. Learning organizations are not trapped by rules and regulations which inhibit organizational change. In fact an organization that has learning capability does not need any kind of formalization. Operationalization of learning capability in organizations require the implementation of holographic principles that are presented in this section. The next section further discusses organizational learning process.

18. *Ibid*, p.87.

4.2. ORGANIZATIONAL LEARNING

This section presents a deeper look at organizational learning processes and provides a better explanation of single loop and double loop learning. As mentioned before organizational learning is very crucial since learning means adding new capacities and capabilities so that the organizations can cope with changing environmental circumstances¹⁹. Organizations, like individuals, learn through experience, through taking actions and, as a result behaviors that enable more effective future actions. Kim and Senge (1994) came up with the following organizational learning cycle:²⁰

Kim(1993) presents an integrated framework of organizational learning where individual learning is linked to organizational learning through the concept of mental models as the transfer mechanism. (Appendix A). By mental models, we mean internalized maps (Bostrom et al. 1992), schemas (Fiske and Taylor 1984), belief and assumptions, stories (Pennington and Hastie 1991), scripts (Schank and Abelson 1977), and routines (Argyris 1990) that influence perception and action. Mental models are held by individuals, but they can also be shared.

19. Kim, D.H., Senge, P.M., "Putting Systems Thinking into Practice", *System Dynamics Review*, Vol 10, nos.2-3,1994.

20. *Ibid*, p.279.

Often they are tacit, and even at odds with what people say about their assumptions or beliefs. For example, a manager may say that he believes in collaborative decision making yet consistently make decisions unilaterally. Appendix A presents this framework of organizational learning, in which six potential learning breakdowns are identified.

Individual learning is a necessary but not sufficient element of organizational learning. In Appendix 1, the process of individual learning is represented through the OADI cycle of observation, assessment, design, and implementation (Kofman 1992). Like many other characterizations of the learning process, the OADI cycle directs our attention to the fact that all learning occurs over time, as we move between a domain of reflection (assess and design) and action (implement and observe consequences of our actions) (Kolb 1984). The process of individual learning is embedded in a larger feedback process whereby individual learning interacts with individual mental models. What data we as individuals see and how we make sense of our observations are conditioned by our cognitive frames (Fiske and Taylor 1984; Schank and Abelson 1977). The actions we take are shaped by our internalized behavioral routines (Argyris

1990; Argyris et al. 1985). Potentially, these mental models can change, although there is much evidence that this often does not occur. When mental models do change, there is a more complex learning process, which has often been termed second-order learning or double-loop learning (Argyris and Schön 1978; Kim 1993b).

Individual mental models are often strongly influenced by shared mental models. Individuals with assumptions and behaviors that are at odds with their larger social milieu experience many forms of pressure to conform. In turn, it is possible that changes in individual mental models may lead to changes in shared mental models, indeed, this is the only way that shared mental models ever change.

In an organizational setting, individual action is distinct from organizational action, both of which are influenced by mental models that shape individual actions through individual learning. In addition, organizational actions are directly influenced by shared mental models. This happens most often through standard operating procedures and operating policies, and established ways of making decisions in organizations (Forrester

1961). Like individual mental models, shared mental models and operating policies may be tacit and unrecognized, even by the people whose actions are being influenced by them. The preceding framework recognizes that both individual action and organizational action may lead to an environmental response.

Tracing around the outer loop in Appendix A, we see the most basic loop of organizational learning: individual actions lead to organizational action, which in turn produces an environmental response, leading to individual learning and new individual actions. If the environmental response is static and unchanging, individual beliefs, actions, and therefore organizational actions will also remain unchanged. If there are changes in the environment, there are two basic learning possibilities; individuals adjust their actions based on new information, with no adjustment in underlying mental models (single-loop learning), or there is an adjustment in mental models and actions (double-loop learning). If changes in individual mental models occur, this may also lead to changes in shared mental models, which could then lead to further changes in organizational actions. This would represent organizational double-loop learning.

Kim and Senge's conceptualization of organizational learning provides valuable insights concerning the creation of organizational designs that do not prevent learning. One thing is very clear: hierarchies, with their clearly defined jobs, rules, regulations, etc., are not relevant for learning organizations.

Self management and organizational learning are two concepts that can be used as useful tools for building non hierarchical organizations. In the remainder of the thesis some alternative organizational forms that allow self management and learning are presented.

5. NON-HIERARCHICAL DESIGN ALTERNATIVES

5.1. NETWORK ORGANIZATIONS

Today's firms need the competence to act fast in whatever they do. The network form of organization emerged in response to a complex, fast paced competitive environment that is making challenging demands on firms across the global economy. Today's environment requires the efficiency provided by the specialized skills and assets usually associated with the functionally structured firm; the flexibility and responsiveness expected of the innovation oriented team and divisions; and the ability to shift resources laterally across units²¹. It seems that in today's environment business can best be done by combining the talents of more than one firm. As firms get specialized on certain parts of the value chain their relations with other parts are becoming crucial. The entire set of existing and potential relationships among firms in an industry can be called a network organization²². Networking is a response to the environmental condition that demand efficiency and adaptability at the same time.

Sometimes a number of small firms might come together to participate in large scale projects. Here each firm remains a separate entity with its own workforce, facilities, accounting

21. Miles, R.E., Snow, C.C., Fit, Failure, and the Hall of Fame: How Companies Succeed or Fail, Free Press, 1994.

22. *Ibid*, p.98.

systems and so on. Other times a big company might restructure its organization into smaller business units. The overall objective of this type of change is to reduce central coordination requirements and create more flexibility.

Three forms of networks can be identified. These are:²³

5.1.1. Stable Network:

The stable network is designed to serve a mostly predictable market by linking together independently owned specialized assets along a given product or service value chain¹⁰. However instead of single vertically integrated firm, the stable network substitutes a set of component firms, each tied closely to a "leading" firm by contractual arrangements, but each maintaining its competitive fitness by serving firms outside the network.

"One well-known company that is organized this way is Nike. Nike's core competencies are R and D and Marketing. By heavily staffing itself with specialists in biomechanics, exercise physiology, engineering and industrial design, Nike is able to stay at the forefront in athletic footwear re-

23. *Ibid*, p.101.

search and development. Nike's other main strength is marketing. The company views itself as an "authentic" player in the athletic footwear and apparel industry: former world-class athletes work with current top athletes to design and market the best equipment. This authenticity is surrounded by a vast array of marketing capability. This includes product advertising via contractual arrangements with highly visible athletes, a state-of-the-art film production facility at corporate headquarters that makes films and videos for Nike conventions and marketing events and a variety of marketing and sports management programs that bring into the Nike stable newer star athletes.

The production function has never been important for Nike which manufactures only a tiny fraction of its own products. Nike is the leading example of a network of manufacturers." ²⁴

24. Ibid, p.102.

5.1.2. Dynamic Network

The operating logic of the dynamic network is linked to that of the divisionalized form of organization²⁵. The divisionalized organization emphasize responsiveness by focusing independently operated divisions on distinct but related markets. The combination of central evaluation (corporate) and local operating autonomy (division) is reflected in the dynamic network, in which a lead firm links together independent firms, in alliances of greater or lesser degrees of permanency, to design manufacture and sell a particular product or service. Thus the dynamic network's operating logic is partner-firm independence coupled with the lead firm's overall vision.

"One successful dynamic network is led by Dell Computer Corporation, a downstream player in the personal computer business. Dell's strengths are in customer-driven technology, marketing and service. Dell's success comes from an organizational arrangement that relies heavily on the rapid formation and utilization of key strategic alliances.

Dell sells an ever-expanding array of customized

25. *Ibid*, p.108.

personal computers directly to customers who read about the products in newspaper ads or catalogs. Customers can specify their desired monitor, microprocessor, and a variety of other options. This is the essence of Dell's customer driven technology, a successful direct marketing model that Dell pioneered in the PC business. Dell owns no manufacturing plants; it leases two small factories to assemble computers from outsourced parts. Dell invests heavily in training its salespeople and service technicians. The remainder of Dell's 'modular' organization is a set of other firms with which Dell has formed temporary alliances. What makes Dell's network a dynamic one is that the alliances are most of the time temporary. This gives a high level of flexibility to Dell Computers Corporation." ²⁶

5.1.3. Internal Network

The logic of the internal network requires the creation of a market or markets inside a firm. Here a company's various units buy and sell goods and services among themselves at

26. *Ibid*, p.110.

prices established in the open market. Obviously if internal transactions are to reflect market prices, every unit must have regular opportunities to verify the price and quality of its wares, either by buying and selling outside the firm, or by having access to current comparative data on market conditions. The purpose of internal network is to gain, competitive advantage through shared utilization of assets as well as continuing development and exchange of managerial and technical know-how²⁷.

The operating logic of the internal network flows from that of the matrix form of organization, namely, a dual focus on products and functions²⁸. When a company wishes to operate globally, a third dimension is added to the matrix: markets or regions. Instead of attempting to achieve a balance across the three matrix dimensions of products, functions and markets through plans and hierarchies, some global companies form internal networks in which decisions and resource allocations are guided by market forces.

Network organizations are indeed different from traditional organizations in several respects²⁹. First instead of holding in-house all the assets required to produce a given product or service, many of today's networks use the collective assets of several firms located at key points along

27. *Ibid*, p.112.

28. *Ibid*, p.115.

29. *Ibid*, p.117.

the value chain. Second, networks rely more on market mechanisms than on administrative processes to manage resource flows. Third, while networks of subcontractors have been common in some industries for years, many recently designed networks expect a much more proactive role among their members, voluntary behavior that improves the final product or service rather than simply fulfilling a contractual obligation. Finally, in an increasing number of industries, networks are evolving that possess characteristics similar to the Japanese keiretsu, an organizational collective based on cooperation and mutual shareholding among a group of manufacturers, suppliers and trading and finance companies.

The following section presents process-based organizations as a first step in creating internal networks.

5.2. PROCESS-BASED ORGANIZATIONS:

Process-based organizations are replacing functional ones, and bringing effectiveness and efficiency to organizations. The main strength of process-based organizations is elimination of lack of coordination between functions. In functional organizations we may see many cross functional disputes. Purchasing buys parts cheap, but manufacturing needs them strong. Shipping moves goods in bulk, but sales promised them fast. Creating process based organizations has become very popular and is being marketed under the names "re-engineering", "core process design" or "process innovation".

The 21st century organization stands at the confluence of three streams³⁰. The first may be described by the term "high-involvement work place", meaning operations with self managing teams and other devices for empowering employees. These participative mechanisms have proved they can consistently deliver gains in productivity, quality, and job satisfaction. Secondly, there is a new emphasis on managing business processes like material handling, rather than functional departments like purchasing and manufacturing. The evolution of information technology to the point where knowledge, ac-

30. *Fortune Article, "The Search for the Organization of Tomorrow", Fortune, May 18, 1992.*

countability, and results can be distributed rapidly anywhere in the organization is the third stream. The challenge is to put these three streams into a coherent practical organization.

Business processes can form the link between high performance work teams and the corporation at large. Organizing around processes as opposed to functions, permits greater self management and allows companies to dismantle unneeded supervisory structures.

Process management differs from managing a function in three ways³¹. First it uses external objectives. Old line manufacturing departments, for example, tend to be measured on unit costs, an intradepartmental number that can lead to over-long production runs and stocks of unsold goods. By contrast, an integrated manufacturing and shipping process might be rated by how often it turns over its inventory, a process wide measurement that reveals how all are working together to keep costs down. Second in process management, employees with different skills are grouped to accomplish a complete piece of work. Mortgage loan officer, title searcher and credit checker sit and work together, not in series. Third, information moves straight to where it is needed, unfiltered by a hierarchy. If you have a problem with

31. *Ibid*, p.95.

people upstream from you, you deal with them directly, rather than asking your boss to talk to their boss.

Frank Ostroff and Daug Smith, consultants in Mc Kinsey and Co. organization performance group came up with a ten point blue print for a horizontal company :³²

(1) Organize primarily around process, not task. Base performance objectives on customer needs, such as low cost or fast service. Identify the processes that meet (or don't meet) those needs—order generation and fulfillment, say, or new-product development. These processes — not departments, such as sales or manufacturing—become the company's main components.

(2) Flatten the hierarchy by minimizing subdivision of processes. It's better to arrange teams in parallel, with each doing lots of steps in a process, than to have a series of teams, each doing fewer steps.

(3) Give senior leaders charge of processes and process performance.

(4) Link performance objectives and evaluation of

32. Ostroff, F., Smith, D., "The Horizontal Organization", McKinsey Quarterly, Number 1, 1992.

all activities to customer satisfaction.

(5) Make teams, not individuals, the focus of organization performance and design. Individuals acting alone don't have the capacity to continuously improve work flows.

(6) Combine managerial and non-managerial activities as often as possible. Let worker teams take on hiring, evaluating, and scheduling.

(7) Emphasize that each employee should develop several competencies. You need only a few specialists.

(8) Inform and train people on a just-in-time, need-to-perform basis. Raw numbers go straight to those who need them in their jobs, with no managerial spin, because you have trained front-line workers how to use them.

(9) Maximize supplier and customer contact with everyone in the organization. That means field trips and slots on joint problem-solving teams for all employees all the time.

(10) Reward individual skill development and team performance instead of individual performance alone.

In the future, executive positions will not be defined in terms of collections of people, like head of the sales department, but in terms of process, like senior-VP-of-getting-stuff-to-customer which is sales, shipping, billing³³. Organization process maps will replace organization charts with their familiar boxes.

An industrial company might select processes like new product development, flow of materials (purchasing, receiving, manufacturing), and the order-delivery-billing cycle. Into these process-flows will go a management team to look after subprocesses and teams of workers to carry out tasks. Whoever is needed will be there: The materials flow group might have finance folks but no marketers- but the marketers will be plentiful in the new product process and so on³⁴.

Turning a functional company in to a product-based one, in fact, is forming an internal network such as was presented earlier in this paper. Processes like purchasing, manufacturing, new product development, delivery and billing can be done by self managing teams and the company becomes a net-

33. *Fortune Article, "The Search for the Organization of Tomorrow", Fortune May 18, 1992.*

34. *Ibid, p.95.*

work of these teams.

In a functional hierarchy job descriptions, career paths, and information flows are all geared toward control of work, workers and knowledge. In the evolving 21st century company work is lined up with customers, not toward bosses³⁵.

Process-based organizations are evolving everywhere, bringing dramatic efficiency increases³⁶.

The next example is a type of network design. It is presented as the new image of organizations that is replacing the traditional image of pyramid.

35. *Ibid*, p.96.
36. *Ibid*, p.97.

5.3.THE SPHERICAL STRUCTURE

The network form of organizations has started to be widely used in many industries. The network form provides companies high flexibility. Control is accomplished by market mechanisms, rather than administrative procedures. Companies with this new structure locate themselves on an industry value chain according to their core competencies, obtaining complementary resources through strategic alliances and outsourcing.

The network form is still evolving. The potential of many of tomorrow's network firms can be achieved only by adopting a dramatically new way of conceiving and organizing work. The spherical structure is providing opportunities for organizations to evolve in this new direction³⁷.

The network form of organization represents a significant departure from previous organizational forms. Principles of hierarchy, that were discussed earlier in this paper are not the principles on which network form of organizations are based. Network forms require effective use of self management. Successful multiform networks combine the resources of two or more firms with complementary competencies. They are often creatively designed, have sophisticated operating approaches, and employ managers who are dedicated to developing an en-

37. Miles, R.E., Snow, C.C., "The New Network Firm: A Spherical structure", *Organizational Dynamics*, Vol 23, Number 4, Spring 1995.

terprise that can simultaneously collaborate and compete. However, one set of new management requirements presents a conceptual barrier. These requirements, increasingly apparent in network organizations, stem from the need to manage internal demands in response to external network opportunities³⁸. Individual network firms can be no more flexible and effective externally than they are internally, their ability to arrange and manage their internal resources determines the quality of their external relationships and services³⁹.

A new metaphor is required to clarify the process and represent the operations of a given network firm. The best way of conceptualizing the required new internal structure is to replace the traditional metaphor of the organization pyramid with that of the rotatable sphere (Appendix 3).⁴⁰

"The typical pyramidal organization chart shows the up-and-down flow of information and decision-making authority from the CEO to the rank-and-file employee. This shape suggests a stable, unified focus on the environment; no matter where problems and opportunities enter the hierarchy, they are routed to the top for consideration. Eventually,

38. *Ibid*, p.6.

39. *Ibid*, p.6.

40. *Ibid*, p.7.

solutions leave from prearranged locations. The effectiveness of the network organization, in contrast, lies in its flexible, rapid response- the ability to arrange and rearrange resources to meet the changing, unique needs of upstream and downstream partners, and ultimately those of customers. To portray this process, we must repackage the pyramid's resources, figuratively and literally, into a rotatable sphere.

In the ideal spherical firm, resources are infinitely rotatable. When a particular request (problem, opportunity) confronts the organization, the sphere rotates, quickly providing the initiator with a means of accessing the company's entire array of resources. Such an interaction can begin from any angle. Wherever the request touches the sphere, a knowledgeable and empowered organization member becomes responsible for seeing the request through to completion. Although at any given point in time some portion of a spherical firm's resources are at work on existing projects "inside" the sphere, many of the firm's resources will be on the sphere's "surface"- organization members will be interacting with customers, partners, potential partners, and so on. As soon as

the organization confronts its next problem or opportunity, the sphere will rotate once again, bringing the appropriate new set of resources to the surface." ⁴¹

So far, organizational designs that are alternatives to hierarchical ones have been presented. It is necessary to point out that there may be ways of achieving a certain degree of flexibility in hierarchical organizations. Some creative modifications might make a hierarchical organization more flexible than a traditional hierarchy. The following section presents this kind of a design.

41. *Ibid*, p.7.

6.DESIGN FOR PARTICIPATION: THE CIRCULAR ORGANIZATION

Sometimes it is difficult to obtain good will and cooperation from employees who derive little or no satisfaction from their work. For this reason there has been numerous efforts to redesign work. Work structuring, job rotation, job enrichment, and autonomous work groups are some of the more well-known efforts. In most of these, however, the work to be done is not designed by those who are to do it, but by managers and experts.

Unless employees are given a continuing opportunity to redesign their work, they are unlikely to retain their dedication⁴². The work of non-managerial personnel can be significantly enriched by enabling them to participate in management. In circular forms of organizations the hierarchy is preserved to achieve control but at the same time participation is enabled and employees are empowered.

There seems to be a dilemma between democracy and hierarchy⁴³. Hierarchy means, among other things, that managers have authority over nonmanagerial personnel and that some man-

42. Ackoff, R.R., Redesigning the Future, New York: Wiley, 1974.

43. *Ibid*, p.161.

agers have authority over others. However, it appears that participation of lower-level personnel in higher level management diminishes or destroys such authority. Democracy requires that anyone who has control over others be subject to the collective control of the others. If those who are managed control their managers, then hierarchy seems to be destroyed.

This appears to be the case because it is assumed that authority can flow in only one direction⁴⁴. Perhaps the incompatibility of hierarchy and democracy lies in our minds, not in the nature of the things. Once the assumption that authority must flow in only one direction is denied it becomes possible to design a completely democratic organization in which hierarchy is preserved.

Ackoff (1974), developed a design, called circular organization, which is both democratic and hierarchical⁴⁵ .

In a circular organization managerial positions are not occupied by single managers but by a committee consisting of the immediate superior and subordinates of the manager. The top board contains the chief executive officer, his other immediate subordinates representatives of external stakeholders

44. *Ibid*, p.162.

45. *Ibid*, p.164.

and representatives of each level of personnel. The lowest-level boards contain all the nonmanagerial personnel, who report to the lowest-level managers.

This design is democratic because every person in the system who has control over others is subject to the collective control of the others. The arbitrary imposition of authority on any member of the organization by any higher authority is eliminated.

Each management board develops its own rules of procedure. Since all the boards contain managers from superior levels, coherence of the rules in different levels can be achieved easily. These boards, to some degree, give flexibility to the organization, but it is important to emphasize that they are not management committees. They do not make decisions however, managers may use them in an advisory capacity.

7. CONCLUSION

This paper has attempted to demonstrate that hierarchies as forms of organizational design are not necessary and are rapidly decreasing in number. Hierarchies fail to meet the requirements of today's environmental changes. They prevent learning, and it is difficult to modify the structure as fast as the demands of the environment change. Hierarchies are losing their value as an organizational form. Other forms have shown the hierarchy to be less effective and less efficient.

It was shown that the search for non-hierarchical organizations should start by reversing the three hierarchical principles: centralization, formalization and complexity. A non-hierarchical organization should be a decentralized one but a decentralized organization without self-management capability would be a chaotic one.

Reversing the principle of formalization, or creating organizations without formal rules and regulations also require self management. Here organizational learning becomes crucial. Organizations without formal rules and regulations should be able to create their informal rules and regulations and change them when necessary.

Finally, the design alternatives presented in this paper are simpler than hierarchical forms. Network form is a simple

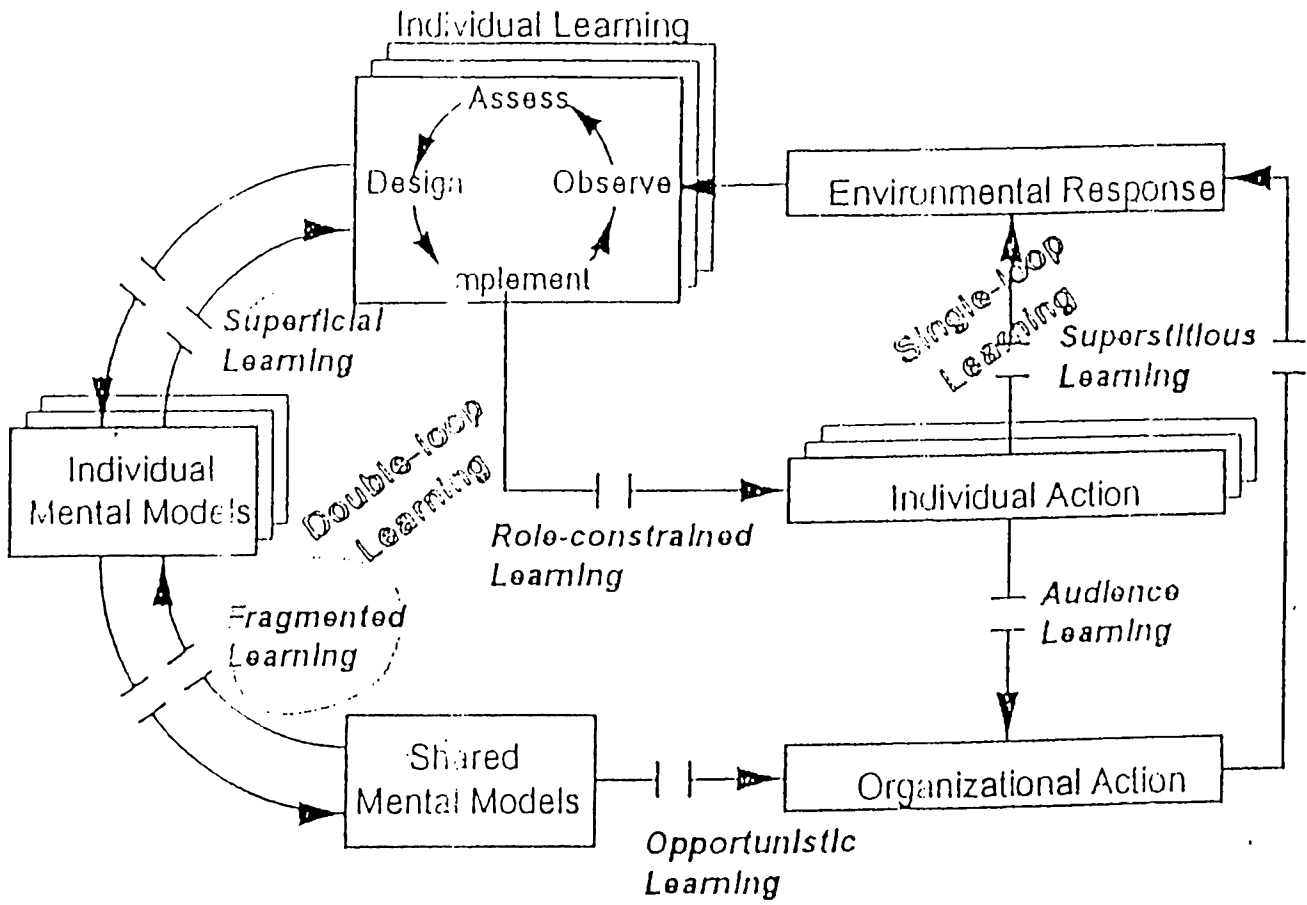
form which enables parts (teams) to be added or excluded easily. Process-based organizations are also simple ones in the sense that they eliminate unnecessary procedures. Process-based organizations can also be viewed as internal networks.

The strength of these design alternatives is that they enable self-management and organizational learning, bringing flexibility and efficiency to the organizations.

However one should keep in mind that hierarchical organizations can be made flexible when creatively modified, as shown in circular organizations.

Future organizations will have to be networks of self-managing teams. There are useful theories about self management and organizational learning that can provide us with valuable insights in designing organizations. In practice we can observe that new organizational forms are emerging that are non-hierarchical. Process-based organizations can be evaluated as the first step of a transformation from functional bureaucracies to networks of self managing teams. By defining the processes and organizing around them, companies are creating internal networks and boundaries are disappearing. The degree to which each team is treated as a separate entity and given authority, determines the position of a company on the continuum from functional hierarchies to network of self managing teams.

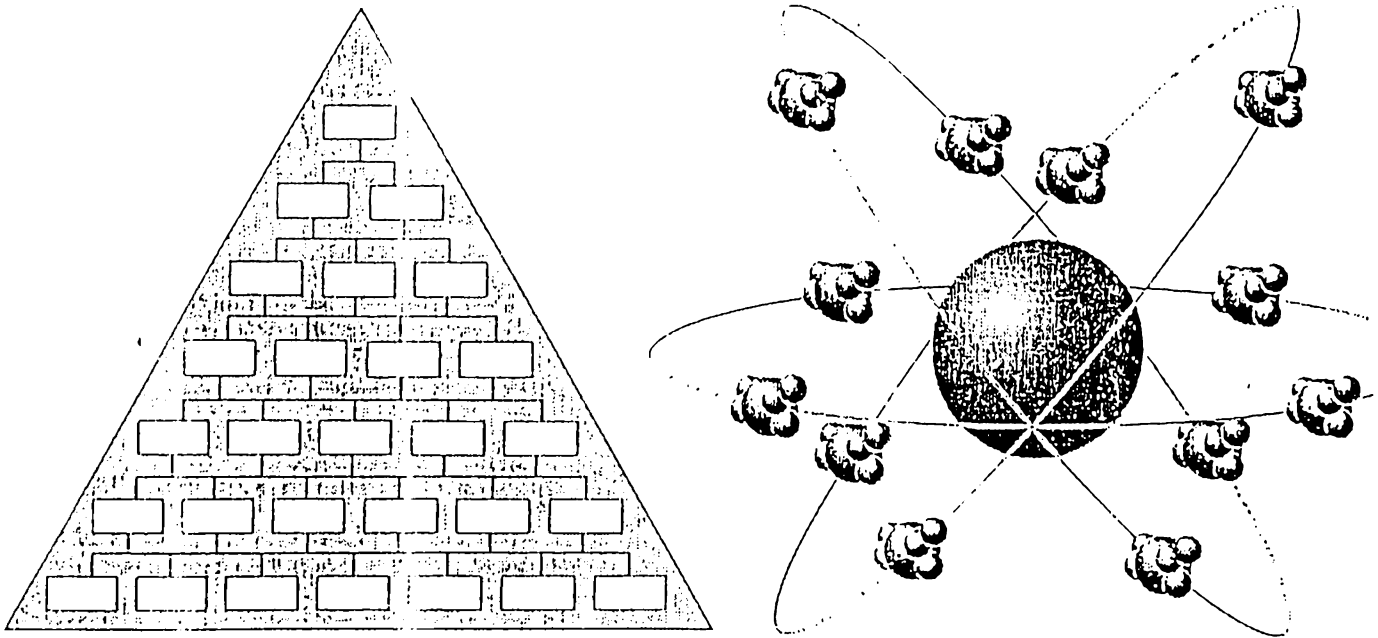
ORGANIZATION LEARNING CYCLE :⁴⁶



46. Kim, p.280.

THE SPHERICAL STRUCTURE :⁴⁷

A NEW ORGANIZATIONAL METAPHOR



Rather than the old inflexible hierarchical pyramid, network organizations demand a flexible, spherical structure that can rotate competent, self-managing teams and other resource around a common knowledge base. Such teams, capable of quick action on the firm's behalf both externally and internally, provide a distinct competitive advantage.

47. Miles, p.6.

BIBLIOGRAPHY

Ackoff, R.R., Redesigning the Future, New York: Wiley, 1974.

Fortune Article by William Bridges, "The End of the Job" Fortune September 19, 1994.

Fortune Article, "The Search for the Organization of Tomorrow". Fortune, May 18, 1992.

Kim,D.H., Senge,P.M. "Putting Systems Thinking into Practice", System Dynamics Review, Vol 10, nos. 2-3 (Summer-Fall 1994).

Miles,R.E, Snow,C.C. "The New Network Firm: A Spherical Structure", Organizational Dynamics.Vol 23, Number 4, Spring 1995.

Miles, R.E., Snow, C.C.,Fit, Failure, and the Hall of Fame: How Companies Succeed or Fail, Free Press, 1994.

Morgan, G., Images of Organization, Sage Publications Inc., 1986.

Morgen,G., Ramirez,R., "Action Learning: A Holographic Metaphor for Guiding Social Change", Human Relations,Volume 37, Number 1, 1983.

Ostroff,F., Smith,D., "The Horizontal Organization", McKinsey
Quarterly,1992 Number 1.

Robbins,S.P., Organization Theory, Practice Hall, Inc, 1990.