

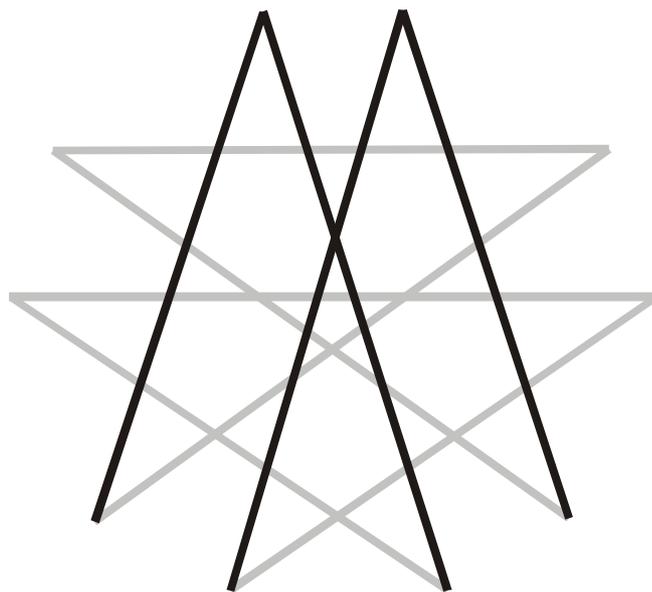
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**The Logic of Heterarchies
Making Organizations Competitive for
Knowledge-based Competition**

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The Logic of Heterarchies

Making Organizations Competitive for Knowledge -based Competition *

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I. Towards the Unknowable Future: Challenges of Knowledge-based Competition

Since the 1950s our modern society has been in a stage of transformation (Etzioni, 1968: vii). The grounds of economic action have been changed due to radical technological transformations in microelectronics, biotechnology, and the development of new manufacturing materials as well as socio-cultural changes. According to respected scholars (Bell, 1973; Drucker, 1969, 1993; Etzioni, 1968), we are moving into a post-industrial era that turns our modern society into a knowledge society. Its primary difference to its predecessor is the shift from material to informational and intellectual resources as a basis of economic progress. Its basic economic resource is neither labor, land nor capital, but knowledge. Economic progress is based on the creation of new expertise that will be used to realize innovative ideas. A knowledge society will be lead by those social groups and persons who are capable of allocating knowledge to productive uses as well as creating a working atmosphere that facilitates the continuous inquiry of the unknowable (Best, 1990; Drucker, 1993; Kumar, 1995).

The implications for business organizations are clear. An increasing number of firms are moving into a new form of competition which can be described as knowledge-based competition. Firms in knowledge-based rivalry are competing mostly on their learning capabilities. The relative importance of capital and labor as a key input factor in the production process is diminishing in favor of knowledge. Accordingly, firms in knowledge-based competition can be labeled as knowledge-intensive in contrast to capital- or labor-intensive firms (Starbuck, 1992). However, in deciding whether a firm really can be characterized as knowledge-intensive, it has to create unique expertise instead of widely shared public knowledge. Knowledge-intensive firms actively choose the terrain on which to compete. They do not seek to maximize profits simply by minimizing costs, but pursue competitive advantage on the basis of innovation in products, processes, and organization. Superior competitive positions and high monopolistic rents are a result of firm's learning abilities that allow faster and more valuable knowledge creation for problem-solving than competitors (Best, 1990). The credo of knowledge-based competition is, as TOM PETERS (1990) puts it: "Get innovative or get dead."

This paper focuses on how knowledge-intensive firms should organize its operations which depend highly on innovative problem-solving. After a quick review and critical discussion of some organizational principles which were put forward by the traditional management literature, a new organizational model will be

proposed for mastering the challenges of the new competition. In contrast to the rigid hierarchy, a flexible self-governed organizational form will be suggested that is labeled as heterarchy¹). The basic idea and underlying assumptions will be summarized. In addition, some leverages for managing heterarchies will be outlined.

II. Why Traditional Management Logic Fails

Traditional management thought is based on a mindset established by mainstream management literature. The contributions to this paradigm of management go back to the early works of the scientific management movement and the administrative management theory. In the more contemporary literature, the planning school (for an overview see Mintzberg, 1994) favors the same principles for establishing stability, consistency, unity, and formality in organizations as recipes of successful survival. One of the main propositions in this paper is that the traditional logic of management suggests organizing principles which lead to a downfall in knowledge-based competition. If management does not want to repeat the past, but to move into uncharted waters for inquiring the unknowable future then we need a new mindset traditional thinking cannot deliver. The following discussion picks up three fundamental management principles and discusses its implications for learning and innovation.

FORMALIZATION: DESPERATELY SEARCHING A LOGIC OF INNOVATION

The idea of institutionalizing innovations is widely proposed in the management literature. This idea was highly supported by the early works of HERBERT SIMON who gives in his "the new science of management decision" an optimistic assessment of heuristic problem-solving methods. He advocates acquiring the technical capacity to automate novel decision-making (Simon, 1960). Since then the management literature has been engaged in automating novel inquiring processes. According to JELINEK (1979) innovations can be institutionalized or programmed in formalized processes and structures. STEINER (1979: 9-10) believes in the possibility of duplicating the cognitive processes of a brilliant intuitive planner in a formalized planning system. TEECE, PISANO and SHUEN (1992: 28) propose dynamic routines that are directed at establishing new competencies.

¹) For a detailed discussion of the concept and management of heterarchies see Reihlen (1996). Similar models have been proposed in the literature that have much in common with this interpretation of a heterarchy. See also Baker, 1992; Burns/Stalker, 1961; Hedberg/Nystrom/Starbuck, 1976; Hedlund, 1986, 1994; Mintzberg, 1979, 1989; Scharpf, 1993; Tichy, 1981.

The formalization of the innovation process would be possible if there existed a general method or logic of innovation that could be institutionalized in some form of tacit or explicit routine. This routine would function as a general problem-solving method enabling an organization to execute innovative solutions in a rule-directed manner. Given the large number and variety of novel problems an organization faces, it is doubtful that a logic of innovation or a dynamic routine, capable of tackling any innovative problem, exists or could ever be built. As the philosopher MARIO BUNGE (1985: 227-228) points out:

"Every design problem calls for specialized knowledge as well as creative imagination. (...) In other words, there can be no *general design method* enabling one to execute designs in a rule-directed manner and without any substantive knowledge. The idea that such a method exists and can be learned separately from the practice of design is just absurd as the idea that all one has to do in order to become a scientist is to master the scientific method. (...) In brief, design cannot be made into a rule-directed activity, nor must it count exclusively on the designer's imagination: like scientific research, design is a creative process that can be guided by the fund of knowledge."

Moreover, empirical and conceptual works show evidence that formalization of the innovation process is one of the biggest obstacles for fundamental learning processes. Innovations require the release of creative capacities within the organization. In order to understand how organizations can mobilize its creative potential, one has to realize how the creative process works. Taking evidence from psychological research, it seems highly doubtful that formalized structures and processes can lead to unique ideas (Schönpflug/Schönpflug, 1995). Formalization implies rigid rules and procedures which discourage creativity, fantasy, and organizational flexibility. Formalization obstructs questioning of existing strategies, building informal communication networks, and self-organizing of learning processes which are important to any innovation process. In short, formalization might support efficient routine problem-solving, but it does not facilitate creative learning processes (Burgelman, 1983, 1988; Miller, 1990; Mintzberg, 1994; Stacey, 1992).

HIERARCHY: COMMANDING EXPERTS HOW TO LEARN

Traditional management thinking is based on hierarchical governing systems. Even innovators in the management literature as SIMON (1960) propose the pyramid organization for handling novel problems. Decision-making power in a hierarchy is based on the authority a person obtains from his or her position in the bureaucratic structure. Therefore decision-making power is concentrated at top man-

agement and diminishes subsequently when moving to the bottom (Mintzberg, 1979, 1983). One major characteristic of hierarchical governing systems is the general decision power a person receives from his or her position in the hierarchy regardless of the expertise the person possesses for solving a given problem. Hence, the hierarchical power structure is rather ill-suited for the efficient management of innovative inquiring processes because it does not support the flexible reconfiguration of decision-making power according to problem requirements.

In essence, knowledge-intensive firms are learning communities because their goal is the creation of unique and valuable expertise used for the design of new products and processes. The efficiency of a learning community depends on the kind of coordination as well as on the flexibility of the communication channels for knowledge transfer. These structural characteristics have a strong influence on how an organization utilizes its employee's expertise. Hierarchies cause substantial difficulties to the efficient allocation of expertise in organizations. Firstly, communication in hierarchies is regulated and vertical in nature because it is closely coupled to the line of authority. Horizontal knowledge transfer between departments or divisions becomes a troublesome undertaking impeded by the vertical hierarchy. Secondly, in contrast to financial capital, knowledge cannot be easily centralized at the top of the organizational pyramid. A great deal of knowledge used in decision-making is tacit knowledge (Bunge, 1983; Nelson/Winter, 1982; Nonaka/Takeuchi, 1995) that is acquired in time consuming learning processes. While tacit knowledge is important in making thoughtful judgements, it cannot be totally articulated and transferred. Assuming that knowledge is decentralized, it seems more efficient and effective not to carry decision-making knowledge up the hierarchy, but to make the decision where the best problem oriented expertise is located within the organization (Hedlund, 1994). Finally, the rigid hierarchical mode of coordination might exploit informational efficiency and economies of specialization under predictable and analyzable conditions. But efficiency in hierarchies becomes problematic when learning processes require a high degree of knowledge sharing in order to realize horizontal coordination and flexible adaptation to changing needs. A high degree of specialization makes knowledge sharing difficult because organizational members lack mutual knowledge (Giddens, 1979) enabling far-reaching communication between different departments (Aoki, 1988, 1990).

In brief, hierarchical governing systems are inappropriate for the efficient coordination of knowledge creation processes. A more flexible model is needed that

allows a better allocation of expertise and a flexible reconfiguration of decision-making power.

UNITY: CULTIVATING A NARROW COLLECTIVE MIND

Traditional management models strive to create a unified and highly integrated organization. Every aspect of the organization should be designed according to the efficient exploitation of existing competitive positions. Strategies, cultures, and structures should be congruent with firm's goals and top management visions (Andrews, 1971; Learned et al., 1969). In discussing traditional management principles, STACEY (1992: 2) writes:

"... an organization should have a common and unified culture. Managers and staff throughout a firm are supposed to share a single vision, believe in the same mission or business philosophy, and follow the same rules."

Unity as an organizing principle cultivates a narrow collective mind aligned to a pre-determined strategic path. While ideological organizations might facilitate efficiency under stable conditions, they are ill-suited for knowledge-based competition. If innovation and novelty are the primary competitive goals, then uniformity of thought within the firm becomes a major obstacle to success. Learning organizations need a degree of contradiction, competition, and a variety of cognitive orientations of their members in order to continuously question the current fund of knowledge that is often taken for granted. Uncovering, challenging, and replacing strategic assumptions can just flourish in organizations which cultivate diversity in people's experiences and cognitive dispositions. Therefore dissensus and diversity can play a highly constructive role in fundamental learning processes (Mason/Mitroff, 1981; Rescher 1977, 1985, 1993). In contrast, ideological organizations facilitate a groupthink effect that impedes rational knowledge creation. The groupthink effect emerges in strong coherent groups where group members attempt to realize unanimity, consensus, and harmony of their efforts. At the same time, the ability for creative thought and rational judgement are negatively affected by group pressure (Schönflug/Schönflug, 1995). As PASCALE (1990: 85) noticed:

"Ironically, the old mindset encourages us to devote a great part of management energy to maintaining equilibrium, eliminating tensions, enhancing consistency, and achieving a happy medium. But when you eliminate the polarities, you sacrifice vitality."

Knowledge-intensive firms have to create an organizational climate supporting cooperation without driving out competition, contradiction, diversity, and conflict that are the grounds of productive collective learning. In short, an innovative firm is not ideological, but pluralistic in nature.

III. Heterarchies: Towards a Knowledge-based Model of Coordination

How should an organization be designed for mastering the challenges of the knowledge-based competition? What is the underlying governing logic of a knowledge creating organization? The following section develops the idea of a pluralistic and flexible organizational model called heterarchy. The vision of a heterarchy is a self-governed organizational form structuring its operations according to the requirements of the innovation process, favoring cooperation even in the face of conflict and dissension while combining the decentralized knowledge in a problem oriented structure. Basically, heterarchies are pluralistic organizations that rely on the initiative of its members to engage in learning activities to handle the uncertain future. Heterarchies turn one of the most basic messages of scientific management upside down. Not the formal structuring of activities is the primary focus of management efforts, but the stimulating of initiatives and the coaching of the human problem-solving skills.

1. The New Governing Logic

The vision of a flexible organization seems fascinating, but it requires a more fundamental change in thinking about governing complex systems. Advocates of the traditional management mindset might be inclined to disqualify the description above as utopian because it contradicts the hierarchical model of complexity (Simon, 1967) and the hierarchical governing logic of supervision (Weber, 1976). The problems of traditional management thinking, discussed above, raise considerable doubts whether this assessment is tenable. The hierarchy is in a stage of crisis. This proposition finds increasing support from theory and practice (Heckscher/Donnellon, 1994; Ochsenbauer, 1989; Rosner, 1991). To what conclusion should this lead us? Two possible ways could be differentiated. On the one hand, the attempt could be launched to modify the hierarchical governing logic without rejecting its core. The proposals of a networked hierarchy that is supplemented by horizontal coordination devices fall into this category. On the other hand, the hierarchy model could be replaced in favor of an alternative model. However, this second approach moves us into uncharted waters as system theorist WILLKE (1995: 74, translated with modifications by the author) explains:

"We can observe hierarchical systems if we developed useful concepts of what makes up a hierarchy. However, we cannot perceive at all non-hierarchical systems like complex networks, chaotic systems, branched out heterarchies if we do not have developed or rather invented in advance a concept of the reality of this system form."

In this paper, an alternative approach will be utilized to investigate a different governing logic for the innovative organization. Central thoughts of how complex systems are controlled come from early neuropsychological research done by WARREN MCCULLOCH who already describes in 1965 the functioning of the human brain as a neural network. In contrast to older conceptions based on a hierarchical functioning of the human brain with sequential information processing, he postulates the type of "heterarchy" and a network organized like a neural system with parallel information processing. Today neural networks play a superior role in the development of cognitive models in psychology as well as in computer science for the design of "intelligent" automates (McCulloch, 1965; for an overview Schönplflug/Schönplflug, 1995). Without overusing the analogy to neural networks, interesting parallels can be drawn between neural networks and heterarchical system organizations. In heterarchies, organizational members and units are connected with each other without excluding anybody from participating in decision-making for organizational reasons. While open communication channels and decision-making power are restricted to a privileged elite in a hierarchy, these functions are not determined by the formal structuring of authority relations in a heterarchy. Moreover, coordination patterns are developed according to situational requirements. Heterarchies allow an equal participation of all members in problem-solving. In this respect, they are democratically organized. No member of a heterarchical system will be kept from dealing with new information, problems or solutions because of the system organization (Hejl, 1992a, 1992b). Heterarchies are negotiated systems (Scharpf, 1993; Willke, 1995). Coordination is reached through mutual adjustment and participative management between organizational members.

It might be thought that negotiated systems are akin to mob rule or anarchy. Nothing like this: heterarchies are an orderly arrangement with social structures that tie system elements together, though not in a hierarchical manner. Heterarchies rely on self-organizing competencies of organizational members who are responsible for enabling knowledge transfer and making decisions through collective decision rules. People fulfill certain functions for the organization according to their situational problem-solving expertise. The management of heterarchies is built on the *principle of potential leadership* (Willke, 1989, 1995). In this system, indi-

viduals assume management responsibility according to their problem oriented decision expertise. Therefore decision-making power will not be transferred on a permanent basis to a decision unit. Rather it will be negotiated ad hoc according to problem requirements. In heterarchies, ignorance and incompetence of decision makers will immediately lead to a deprivation of power. Conversely, decision power in hierarchies can be preserved under the cover of authority a person receives from the position in the organizational structure despite of his or her problem-solving expertise.

Heterarchies operate within a tension between autonomy and integration. The autonomy of organizational members is a result of minimal formal organizational design. It gives every member greater freedom for perceiving, conceiving, and solving problems they believe are important to the organization. Members are permitted to act upon their beliefs and values and can pursue to a degree their own interests. Autonomy of actors is a central feature of a heterarchy with no participants being excluded from information and decision processes due to institutional design. On the other hand, the egoistic realization of self-interests must be restricted when the possibility of lasting and long-term relations between organizational members are endangered. Members have to accept collective norms and must commit themselves to principles of justice, trust, and cooperation which provide the cultural clue allowing constructive conflicts without sacrificing variety.

Heterarchies combine autonomy with cultural integration to create a flexible organizational configuration. It allows the merging of decentralized intelligence within an ad hoc system of horizontal coordination. The unique combination of long-term cooperative relations with competition makes a heterarchy a superior innovative organization. Managing the tension between autonomy and integration is a difficult enterprise. Without cultural integration a heterarchy deteriorates into an anarchy or a political arena in which individuals are motivated only by self-interests. Excessive cultural control leads to the elimination of the pluralistic character and deprives the organization of its innovative capability. Moreover, the organization will degenerate into a belief system sacrificing its creative potential to a uniform dogma.

2. Assumptions

The governing logic of heterarchies is based on some assumptions that will be discussed in this section. From a management perspective, these assumptions must

be taken into consideration to realize the advantages of higher flexibility, responsiveness, and learning in comparison to hierarchies.

CONTEXT: ORGANIZING FOR THE UNKNOWABLE

A heterarchy is not an ideal organizational form for every task environment. Exploiting existing competencies and solving routine problems with existing experience require different organizational arrangements than exploring the unknowable future. A firm should not go without the merits of formal organizing if problems are recurring, foreseeable, and analyzable. Hence, heterarchies are designed for handling innovative problems. On the contrary, they are ill-suited for the efficient exploitation of existing knowledge. Facilitating self-organization, discussion, and bounded conflict does not make sense when organizations can develop a best way to solve a known problem.

PEOPLE: THE SELF-ORGANIZING PERSONNEL

People working in heterarchies do not fit into the traditional management view. How can you imagine to realize innovative solutions with people who are viewed as lazy, ambitionless, and irresponsible (McGregor, 1992). Likewise, radical individualism (for a critic see Etzioni, 1988) is based on a distorted concept of human nature. It assumes an undersocialized individual who acts autonomously according to his or her individual preferences. The special feature of a heterarchy as a kind of negotiated system respects the autonomy of its members. However, it requires their commitment to collective norms and beliefs as well as a convergence of interests for realizing collective learning processes. People must develop networking skills, take initiative, feel responsible for what they are doing, and should be skilled in managing conflicts. Heterarchies work best with people who are highly educated, have high self-esteem, strong needs for achievement, self-actualization, and autonomy (Tichy, 1981).

POLITICS: EXPERT-DEMOCRACY FOR KNOWLEDGE-BASED DECISION-MAKING

A problem solution is bound to be ineffective unless it is designed with the help of the best available knowledge. In heterarchies decision-making power is ultimately tied to situational expertise of organizational members. Hence, decision competencies have to be negotiated according to democratic principles since they vary with problem requirements. The political system can be labelled as ex-

pert-democracy. In expert-democracies, people are reasonably well-informed about the business of their firm and they get involved actively in its decision-making process instead of receiving commands from higher level management.²⁾ In addition, every democratic form of decision-making has to be supplemented by conflict resolution mechanisms. Conflict is natural in a heterarchy because of its pluralistic character. However, restoring organizational ability to make decisions in dead lock situations requires special forms of conflict management.

CULTURE: CULTIVATING THE SOCIAL GLUE

Organizational culture plays a more important role in self-organizing heterarchies than in hierarchical systems of supervision. Coordination in hierarchies is embedded in institutional blueprints, standard operating procedures, and formalized structurings. Heterarchies lack these formal mechanisms of integration. Instead, they are compensated by a cultural integration which may be viewed as a prerequisite of any self-organizing system. Heterarchies have to cultivate collective beliefs, values, and norms for sharing knowledge and building a climate of trustful cooperation. Risky experimentation, initiative, and entrepreneurship depend not only on individual skills, motivation, and personality. It must also be facilitated by a culture supporting these values.

IV. Managing Heterarchies

The heterarchical governing logic does not follow the idea of managing the innovation process by direct supervisory intervention. A central management which intervenes in collective learning does not have the necessary knowledge to directly control the process. The collaboration of experts with specific knowledge is hardly controllable. If everybody understands how the processes are organized, then special expertise would not be required. Hence, governing the innovation process must be fulfilled by the people working together in the knowledge creation process.

The innovation process will be controlled by a more subtle form. Management has to create a context inducing strategic behavior as well as providing a climate for learning and experimentation (Burgelman, 1983, 1991). Establishing a framework for innovation and giving guidance for self-organization are the main tasks of management in knowledge-intensive firms. The organizational context encom-

²⁾ See also the technodemocracy described by Bunge (1989: 340, 350).

passes administrative and cultural aspects (Bower, 1972; Burgelman, 1991; Ouchi, 1981). This section discusses some contextual variables like organizational culture, human resource development, conflict management, incentive systems, and career patterns enabling networking and knowledge creation.

CULTIVATING AN INNOVATIVE COMMUNITY

Heterarchies need a common culture as the social glue holding the system together and giving direction for developing the future. Heterarchies require a shared culture without being ideological discouraging risky experimentation, critic, conflict, and contradiction. Innovative communities combine pluralism which tolerates and partly appreciates dissension and conflict with social elements supporting cooperation, trust, openness, and tolerance. The innovative culture can be described as a combination of pluralism with unity. Hence, a bounded but permanent conflict between members will be maintained without undermining common interests. Heterarchies do not need agreement of individual goals with goals of the organization because members of heterarchies often belong to different organizations. Uniform interpretations, world views, and goals are not necessary for a coordinated collective learning process. At best, they are a result of organizational efforts, while not an indispensable condition of collective problem-solving. An innovative culture is in a state of bounded instability which combines competition with cooperation (Bunge, 1989; Rescher, 1993; Stacey, 1992). The development of an innovative community is an essential element for functioning heterarchies. A cooperative and trustful social climate is needed for members to feel secure, explore their limitations, and engage in speculative conjecturing and risky experimentation because they know of their supporting community.

DEVELOPING INTEGRATIVE SKILLS

The efficiency of heterarchies depends largely on the quality of the information structure of the firm. This structure rests to a great extent on the information-processing capabilities of employees who operate it. Integrative skills of employees enable them to have higher information-processing capabilities at their disposal. Integrative skills are developed over a relatively long period of time within the firm. They can be characterized by a broader understanding and a deeper knowledge of the full range of the firm's activities in which a person is directly or indirectly involved. Hence, integrative skills provide the employee with a deeper comprehension and knowledge of the job related context he or she is working in. With this understanding about the firm's other areas and functions, it is possible to

identify joint action and mutual enhancement. The efficiency of self-organization as a coordination mechanism depends to a great extent on employees' ability to activate informal networks for receiving first hand information and solving problems (Aoki, 1988; Hastings, 1993; Kanter/Stein/Jick, 1992).

The development of integrative skills can be facilitated by informal networking, job-rotation, interfunctional learning cycles, and broader qualification. In addition, people who acquired these firm specific capabilities are of great value for the company because they allow a flexible coordination and enhance the information-processing capability of the organization. Employees who established a reputation over time for developing integrative skills should be given long-term employment. They are the backbone of operating a heterarchical system.

CONFLICT MANAGEMENT

Conflicts are natural in heterarchies. They arise whenever interests collide. Conflicts stimulate thinking and challenge basic assumptions. A constructive mode of disagreement is the basis for learning and innovation. However, it must be acknowledged that conflict does have its negative sides. There is always the danger of escalation from productive competition to destructive conflict turning a heterarchy into a politicized system (see also Rescher, 1993). Hence, conflict management plays a crucial role in any non-hierarchical system. The peculiarity of a heterarchy is that conflicts can neither be suppressed by the visible hand of authority nor prevented in advance by indoctrination. Heterarchies require a different form of conflict management to prevent undermining the governing logic. Conflict management in heterarchies accepts disagreement concerning beliefs and values. But it has to be managed within "reasonable bounds". In heterarchies, the choice of style used in a given situation is tied to two conditions. Firstly, self-organization is based on a more or less democratic form of coordination. This requires procedural arrangements that allow a fair and acceptable handling of the case of conflict. Secondly, in order to facilitate a rational conflict resolution based on the best available knowledge, it seems reasonable to couple the procedure to a disputation or debate over the case. The conflicting parties get a chance to justify and to convince the opponent of the truth or usefulness of their position. The final decision will be made by an independent conflict manager comparable to a judge in a legal trial. In brief, heterarchies rely on effective conflict resolution management to make important decisions even in dead lock situations. Management must be aware of conflict-prone areas for the functioning of the system (see also Morgan, 1986).

INCENTIVE SYSTEMS AND CAREER PATTERNS

Flexibility and cooperation within heterarchies require a change in thinking concerning incentive systems and career patterns. The bureaucratic rewarding logic proves to be dysfunctional for a cooperative and self-organizing collaboration of employees. Generally, rewards in bureaucracies are allocated according to the hierarchical status or position a person holds in the hierarchy (Donnellon/Scully, 1994). This system does not fit into knowledge-based competition. It burdens the firm fixed obligations while failing to encourage experimentation, entrepreneurship, and learning. Moreover, non-cooperative behavior might be supported by individual performance appraisals. The organizational reward structure and compensation system need to be changed.

An incentive system for heterarchies has two additional requirements. Firstly, incentives have to promote employees' integrative learning in order to foster special expertise and integrated skills. Secondly, cooperative behavior must be encouraged to realize collective learning across functional units (Aoki, 1988). Unfortunately this question cannot be explored in detail here. However, in heterarchies, rewards must be commensurate with individuals' contribution to the firm's competitiveness (Kanter, 1989). Measuring this contribution must encompass a wide range of factors including skills, cooperative behavior, expertise, performance, motivation to learn, and diligence.

Moreover, heterarchies cannot offer a traditional career. Climbing up the corporate ladder is being replaced by changing jobs on an ad hoc basis. Heterarchies do not offer their employees permanent positions. Career patterns are instead determined by professional or entrepreneurial principles. People must develop skills and expertise to establish a reputation and increase the demand for their services. Instead of relying on an organization to provide a career, people in heterarchies have to rely on their own skills. While the key resource in a bureaucratic career is the position in the hierarchy, it will be reputation based on expertise in a heterarchy (Kanter, 1989).

V. Implications

The heterarchy is an alternative coordination model for organizations. It neither shows features of a hierarchical system of supervision nor is it based on the invisible hand of market transactions. As a negotiated system, its strength lies in the ability to provide higher flexibility, responsiveness, and learning capability. At the same time, this could be the heterarchies' greatest weakness. Managing heterar-

chies is based on the creation of a bounded conflict and an organizational context facilitating wide-ranging cooperation without undermining competition. This will always be a balancing act or a "managing on the edge" as PASCALE (1990) pointed out in a similar context. Heterarchies become particularly fragile social entities because they are in danger of degenerating into ideological belief systems if cultural control extinguishes variety. Heterarchies may also turn into political arenas if common interests are lost and competition causes fragmentation and destruction.

Heterarchies are well-suited to innovative problem-solving. However, this does not mean that it is an ideal model for every organization. If people cannot cope with the changing nature of their jobs, are not willing to cooperate, or do not assume responsibility for their actions then heterarchies are in danger of getting out of control and turning into an anarchy. The heterarchy is an idealized model of thought which might not be implementable in its pure form. But the more a firm's competitiveness depends on the ability to learn and to innovate, the more important elements of the heterarchical logic of coordination become.

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