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THE CONTEXTS FOR GEOGRAPHICALLY DISPERSED TEAMS AND NETWORKS

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The Context for Geographically Dispersed Teams and Networks

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In this era of global integration, electronic connectivity, and network and partner structures, work is with increasing frequency performed and integrated by geographically dispersed, or distributed, teams and networks. These are groups of individuals in different locations and often in different business units or companies who share accountability for a product, service, or collective function or task, and who are interdependent in carrying out their accountabilities and thus must work collaboratively to accomplish them. A primary characteristic of these distributed structures is that, although periodic face-to-face interactions may occur from time to time, the largest part of the work is done while members are geographically separated. Consequently, face-to-face interaction must be replaced and/or supplemented with considerable coordination and integration using information technologies.

A growing literature has examined the impact of and the factors facilitating and impeding successful collaboration using various information technologies in geographically dispersed teams both within and across organizational boundaries (e.g., Johansen, 1988; Galegher, Kraut & Egido, 1990, Huber, 1990; Jarvenpaa & Ives, 1994; King, Rice, Majchrzak, Malhotra & Ba, 1998). Much of this work focuses on benefits and costs to individuals and companies of use of such technologies, the process gains and losses of using them, and on what work is best performed electronically as opposed to face-to face.

This chapter examines the organizational contexts that affect distributed work: contextual features that impede or facilitate such work and the nature of the contexts that have to be built for successful functioning of distributed work structures. It builds on observations

from two longitudinal, multiple company studies: one of cross functional knowledge work teams and other lateral structures carrying out knowledge work (Mohrman, Cohen, & Mohrman, 1995), and the other of the processes of transition to new lateral structures (Tenkasi, Mohrman, & Mohrman, 1998). Neither of these studies focused explicitly on distributed teams; however, a number of the units we studied were geographically dispersed, and certain dynamics were evident.

After reviewing the multiple purposes and kinds of geographically dispersed teams and networks that are becoming common, I make the argument that the greater reliance on lateral structures has fundamentally changed the logic of organizing away from a primarily vertical, bureaucratic orientation, and that accommodating a new lateral logic requires rebuilding the organizational context in which work is done. This is particularly true for geographically dispersed teams. Along with geographical dispersion come often a whole host of other features such as members with varying organizational membership and with different and perhaps conflicting organizational cultures and priorities that have to be addressed in order for effective collaboration to occur. I further argue that rebuilding the new organizational contexts for distributed teams will alter behavioral dynamics in organizations significantly.

Geographically Dispersed Work Structures and Their Contexts:

The Challenges of Collaboration Across Distances

Most companies readily admit that achieving success in these structures is difficult. Working in geographically dispersed structures represents a fundamental change from the old world where people largely worked in functional groupings and sat side by side with others in

their department that they worked with. Work that was done in one place was sent to others

for sequential handling, or all aspects of work were done redundantly in many different, self-

contained locations. Face-to-face interaction was the primary mode of coordination.

Although enabled by rapid advances in information technology, distributed work

structures arise because of business need. Distributed teams and networks are becoming more

frequent in large part because of two concurrent requirements for success in today's global

competitive environment. Many organizations are locating operations throughout the world in

order to be close to needed resources, responsive to local customers, and to gain access to

world markets. At the same time, organizations are having to leverage knowledge, products

and activities across their organization around the world in order to be competitive, requiring

new activities to integrate across their operations. Distributed work structures arise as a result

of the forces both for dispersion and integration; but it is the need to coordinate and also to take

advantage of widely dispersed resources and activities that results in the current rapid increase

in the application of globally dispersed teams.

The words team and network have been used in varying ways in the literature. For the

purpose of this chapter I use the word "team" to refer to an interdependent group of people

collectively accountable for a delivering a product or service. Networks are composed of

people who are involved in dispersed activities and who perform required integration or

coordination functions. Distributed teams and networks assume many forms and are established

for many purposes. Some may carry out the core work of the organization. Ford Motor Co.,

for example, designs and manufactures cars using "teams" of several thousand people working

on multiple projects each of which is made up of contributors spread around the globe (Ferranti,

1997). Consumer products companies often have distributed "logistics" or "product integration" networks that exist primarily to coordinate activities to ensure that product gets to a wide range of markets in a timely, cost-effective manner. Distributed "supply chain" teams examine all the stages in the value chain from raw materials to customers and across all geographies to determine how best to make money: which products will achieve the largest pay-back; which components should be bought or made, which factories should manufacture various products, and which markets should receive priority.

Organizations also use geographically dispersed teams to improve the capabilities of the organization. Process improvement teams often consist of members from various geographical regions who collaborate to introduce new technologies and redefine core organizational processes. A large chemical company that we studied, for example, had a globally dispersed team developing a global recruitment and development system. In addition, organizations are using distributed structures for learning in order to leverage knowledge capabilities. British Petroleum's virtual knowledge sharing networks have been widely cited (e.g., Davenport & Prusak, 1998) because of their effective use of information technology to interact and to spread knowledge across the corporation.

Whether geographically dispersed or not, teams and networks are lateral structures created so that work previously done through a vertical break down structure is now performed laterally through structures that cut across the organization. In the traditional, bureaucratic structure tasks are analytically broken apart into various "silos" and then hierarchically into jobs and assignments that are performed by individual contributors and managed by levels of management in the silo. In lateral structures, both the performance and coordination or

management of tasks are performed laterally in units consisting of the necessary contributors. One purpose for creating such lateral structures is to avoid the process losses inherent in having to deal with issues hierarchically because authority lies above the level of those doing the work and because decision responsibility for the various aspects of a project or product is scattered across various silos.

Most geographically dispersed teams and networks perform knowledge work, work that requires the generation, compilation and interpretation of information and knowledge. Companies comprise teams by pulling expertise from wherever in the company it happens to exist. Research has found the success of these structures is heavily dependent on their interactions with their context: with the systems and people that provide resources and task, goal, and performance-related information to them (e.g., Ancona & Caldwell, 1992; Donnellon, 1996). When the organizational context in which teams operate is set up according to the old functional, hierarchical logic, teams can experience a great deal of difficulty. In her studies of new product development teams, Dougherty (1992) observed that failure to collaborate results in large part from differences in "thought worlds" stemming from the different knowledge bases and algorithms of different functional contributors and also from the routines that are built into hierarchical, functional organizations that tend to segment the work and perspectives of different contributors. She noted that successful teams created internal social systems that overcame the segmentation inherent in their organizational context and established new shared interpretations and processes.

In earlier work (Mohrman, Cohen & Mohrman, (1995) my colleagues and I have found that contextual organizational features in large part determine whether knowledge work teams

are successful in carrying out their mission. These contextual features include direction-setting mechanisms such as strategy and organizational goal-setting and alignment mechanisms, the framework for organizational decision making including clarity of authority, and performance management practices. Team difficulties often stem from tensions with organizational contexts that have been designed to support hierarchical, functional logic. For example, teams find themselves unable to carry out their tasks as planned because their functional hierarchy treats employees as interchangeable and pulls members wherever needed with little regard for the integrity of the team and its work. Rewards and appraisal are done by supervisors who apply standard functional criteria and have little visibility to or concern for the work of the team. Members of the management team may be functionally oriented and provide little common framework for their reports, who are now working in a cross-functional world.

As a result of this research, we have argued that effective transition to an increasingly lateral logic and to doing work through lateral structures requires a redesign of many of the contextual features of the organization. Although hierarchy and concerns for functional excellence do not disappear because the organization is doing much of its work through lateral, cross-functional structures, these lateral structures require a reorientation of attention and a redefinition of responsibility. Members of successful lateral structures think about and are held accountable for the collective task, not just their piece of it. Their attention focuses on the needs and requirements of their teammates with whom they are interdependent, not primarily on the wishes and desires of a hierarchical supervisor. Team members in effective teams learn together, develop mutual knowledge (Krauss & Fussell, 1990), develop mutual expectations about the nature of their task and how to work effectively as a team (Gabarro, 1990), and

interrelate with one another in a manner that is "heedful" of each other's activities (Weick & Roberts, 1993).

This change to a lateral focus is difficult to achieve even in teams located within the same business unit and location. The challenge is even greater when geographically dispersed work structures are being utilized. To develop a fuller appreciation of the challenge of geographical dispersion, I depict a distributed team visually in a series of figures that illustrate the layers of complexity that are entailed. Figure One shows a typical but simplified multi-site cross-functional new product development team. The "Hale-Bopp" project team is designing a sophisticated and rugged land based portable telescope unit that can be moved from location to location and send images anywhere in the world. This is a task that requires the solution of a number of engineering design challenges. Additionally, in order to be commercially viable, the team has to find a way to manufacture this complex instrument with high levels of quality at near commodity prices. Time is critical because ongoing funding of core development activities depends on early demonstration of feasibility.

The project team consists of three sub-teams that are in three different locations. One sub-team is working on the software and firmware system, one on the hardware design, and the other on test and manufacturing processes. Even if the whole project team that is depicted in figure one were in the same location, it would be quite challenged to operate successfully. It is a cross functional unit whose members have highly honed and quite distinct knowledge sets but have to work concurrently and interdependently with one another to meet the simultaneous goals of technological breakthroughs, cost, quality and speed. Thus there are discipline thought worlds to bridge. Furthermore, all of the members of the software and manufacturing sub-

teams are not fully dedicated to the Hale-Bopp project. Rather, they split time with at least one

other project in their location. The Hale-Bopp project vies for attention with other projects.

Much of the work on distributed teams has focused on the project-level context that the

team has to build in order to operate effectively. This includes a framework for communication

and coordination, and norms and guidelines for using information technology to share

information, coordinate the work and perform joint work with common data sets. It also

includes roles and norms for decision making. Developing shared understanding of how the

team will operate when distances are involved and different disciplines are located in different

locations requires overcoming additional barriers. For example, in our studies, the attributions

that are made by team members can seriously reduce team effectiveness. Commonly, software

and hardware contributors devalue one another's work. Hardware contributors may attribute

that software contributors aren't doing anything significant based on their lack of visible concrete

models, prototypes and product parameters that they are used to. The gap becomes even

wider when these two groups are geographically dispersed and each group wants to wall itself

off from intrusions from the other in order to be able to focus on their own part of the effort.

There is also a tendency to not want to share work until it has been perfected, for fear of

appearing incompetent (King & al., 1998). These behaviors lead to further attributions that

work is not being done. These dynamics led in several cases that we studied to members being

unwilling to share information about work in progress, seriously impeding working relations and

the ability of team members to work out their interdependencies. In one project team that we

studied, for example, the software team leader proudly reported that he had instructed his team

not to reply to queries from the other members of the team (who were in a different part of the

country) because they could tolerate no delays in their work. He went so far as to wall off their files from the shared project information system so that hardware people couldn't independently look at their work and start critiquing or make incorrect assumptions. The lack of two-way information flow was estimated to have held up the overall project progress by 2-3 months.

Beyond these common process difficulties that reflect a lack of agreement regarding team strategy and the integrative context for doing work, our research has shown that the directional context in which teams operate is critical (Cohen, Mohrman & Mohrman, 1998). The team's ability to make the complex ongoing trade-offs required in such a development effort depends on its understanding of the organizational strategy and how this project fits in. Its ability to secure the resources and attention it needs from the larger organization depends on whether individual goals, team goals, and the goals of the larger business unit are aligned. Teams were more likely to have a clear directional context if the business unit management team provided consistent cross-functional direction. Otherwise various team members received conflicting messages from their functional heads about mission, purpose, and priorities of the team's project. When the managers above the team are also located in multiple locations, it is more difficult to provide consistent direction to the team members.

Figure two adds another level of complexity that makes it even more difficult to provide consistent direction. It turns out that the members of the Hale-Bopp project are organizationally located in different business units as well as in different locations. In fact, the production team is located in a different corporation, MakeCo, that has a long term partnership with Elcomp, the corporation in which the hardware and software teams are located. Work on this project falls into three different business organizations and contextual frameworks: the sub-teams will be

8

impacted by inconsistencies between the business objectives and priorities in the three organizations. For example in one project team we studied, members of the hardware team were continually pulled away to deal with "bugs" of products already released to the field, because that was the bread and butter of the division that they belonged to. This totally frustrated the software team, whose members' time was fully dedicated to the project and who were well down the development path. The software division was the initiating division for the project and housed the overall project leader, and for this division this project was number one priority. Additionally, tensions between the partner manufacturing divisions and the project team emerged because the production company was unwilling to upgrade technology to deal with demanding performance and process sterility requirements. It viewed this project as a high risk project and could not internally justify additional project-specific investment that would not be needed for the other products they were manufacturing. The sub-teams in Hale-Bopp and in these other examples are embedded in business systems that have different business strategies, priorities, and investment plans. This makes it harder to achieve a consistent direction for the three sub-teams.

Figure two also illustrates the cross-cultural nature of the project team. Not only are the production engineers in the Hale-Bopp project in another company, they are also in another country with a substantially different culture. In many cases, this can lead not only to uncomfortable dynamics in the team, but also to fundamental cognitive misunderstandings that prevent coordinated knowledge work. In our studies, members of such teams talked frequently about getting together (by travelling or through teleconferencing) to work an issue, thinking the issue has been resolved and finding out weeks later that work has not proceeded the way any

members of the team expected based on their experience of the working session. "We found out that we had not communicated at all", was a common sentiment expressed by team members. Cultural differences such as in formality, emphasis on hierarchy, and conflict avoidance or confrontation can exacerbate language differences and cause discomfort, lack of communication, and negative attributions that contribute to poor working relationships.

Figure three introduces yet more complexity to our team. It illustrates the different organizational structural contexts in which the sub teams in the different locations are embedded. The organizational structures are different even between the two divisions of Elcomp. In the Systems Division (A), individual contributors report up through discipline managers. They are peers with the software team leader. In the Electro-Optical Division (B), the team members report to their team leader, who in turn reports into a programs organization. Team members have a weak dotted line relationship to the discipline managers. Although this may seem a small difference, we have found that reporting makes a large difference in terms of the consistency of the direction the team members receive and the priorities that pervade the organization. When team members report for operational purposes to a manager outside the team, they are frequently subject to many pressures for performance that distract from and may even interfere with the work of the team. Another seemingly subtle difference that can cause great difficulties for teams is illustrated by the MakeCo structure. MakeCo team members have solid line reporting up a long hierarchical chain, a configuration that reflects the hierarchical nature of decision making and the relative lack of decision making authority within the manufacturing subteam. This makes it difficult or impossible for the Hale-Bopp project team to resolve issues on line and introduces delays and uncertainty into their work.

10

There are a number of other contextual differences that greatly impact the Hale-Bopp team. In the systems division, for example, the software team leader is also the leader for two other software development programs, and the same individuals are executing all three. Their attention is continually shifting between projects. The members of the hardware team are full-time dedicated to the Hale-Bopp project. The test and process members in MakeCo have this project as one collateral assignment—the majority of their job is spent managing internal projects and workflow within MakeCo. Whereas Hale-Bopp is the second highest priority project within the Electro-Optics Division, it is in the lower half of priorities for the Systems Division, which is a relatively new division and is most fixated on releasing it's own stand-alone systems products. The Systems Division is supporting the Electro Optics Division because of corporate citizenship requirements. In MakeCo, Hale-Bopp is one of ten product development activities that vie for the attention with each other and with fifteen products in current manufacturing. The terms of the partnership agreement dictate that MakeCo receives no revenue from Hale-Bopp until it goes into production. Thus, the overarching business logic and structure of each organization and the terms of their relationship to one another are key contextual factors impacting the Hale-Bopp project team.

As mentioned earlier, contextual factors are critical facilitators of or barriers to performance in all lateral structures. Geographically distributed teams are subject to an even more complex set of contexts that include cultural and business unit diversity. Furthermore, their primary mode of interaction is not through face to face interactions, making it more difficult to work out conflicts, determine shared meaning, and develop an agreed-to framework for

operating. Some of the implications for practice and theory are briefly discussed in the next

section.

Implications for Organization Behavior and Design

Working across boundaries is becoming a key capability in today's organizations.

Projects like Hale-Bopp are becoming routine in many organizations, which means that

individuals collaborate across distances, cultures, organizations, and disciplines. Given the

contextual complexity of such work, a key imperative in today's world is to develop new

models of organization and learn how to create contexts within which distributed work can

occur more naturally. This conclusion is not new. Much writing about new organizational forms

has stressed their boundaryless nature (E.g., Galbraith & Lawler, 1994). However, much

existing writing simply describes these emerging work structures without delving deeply into the

contextual features that have to be developed to elicit the fundamentally different kind of

organizational behavior that they require. The fields of organizational behavior and theory will

have to grapple with many new questions and foster new models for explaining behavior that

can deal with this new reality.

In discussing this, I will not dwell on the obvious and very important issues of

developing, implementing and learning how to operate effectively across distances with new

electronic tools for collaboration. In addition to those issues that have to do with the means of

work, at least four major issues of organization context need to be addressed in order to create

widespread organizational capability to work effectively through distributed teams. These have

to do with governance structures, context-building, lateral and vertical context management, and

the development of human resource systems to fit the new contexts for work. The tension in all four of these areas is between the need for these lateral structures to clearly fit within their organizational contexts in order to achieve ongoing support, and at the same time to be decoupled from those contexts.

Governance Structures

Traditional governance structures have relied primarily on hierarchy. Mission, strategy, resource allocation, much operational decision-making and ultimate accountability have lain with the top management of the corporation. The last two decades have seen an increase in emphasis on decentralization of operational and performance accountability to self-contained business units and increased self-management for operational issues. Recent attention to quality management and process reengineering have made salient the need to purposively manage the lateral processes of the organization in order to assure effective and efficient delivery of value to the customer, and to place decision authority in units that operate laterally. This attention to the lateral dimension of organizing has yielded tension within organizations about how to manage across parts of the organization when the dominant systems and processes support traditional vertical hierarchical control (Lawler & Mohrman, 1998).

The use of geographically dispersed teams and teams that cut across business units and corporations underscores the need to find governance approaches that enable lateral self-management. The Hale-Bopp project, for example, is reliant on three different businesses for resources and ongoing support, and on three different hierarchical structures for decision approval. Rather than yielding agility and flexibility, in our studies such structures were likely to

13

spend a great deal of time slogging through endless issues of contextual conflict and uncertainty. If we assume that each of the three businesses involved in this project are simultaneously involved in a number of other complicated, lateral projects, the amount of time spent in each organization working the context can become overwhelming.

The effectiveness of all teams relates to the consistency and continuity of the direction they receive from their management structure. The challenge posed by Hale Bopp and other similar projects is to set up an inter-organizational governance framework to provide integrated direction to the distributed team. Distributed projects are alliances, in which different units combine resources in order to meet a market need that they could not independently address. Alliances require agreement about governance, generally through some sort of joint process. They also require a clear agreement about the resources that various parties will provide and their accountabilities to one another. It is this governance framework that creates the umbrella within which the operating parties of the alliance can carry out their tasks with reliable support and minimal day-to-day interference from the various businesses that are party to the alliances. Clarifying governance connects these dispersed projects to the mission of each of the business units and simultaneously creates a framework for them to operate independently.

Experience with joint ventures and other forms of alliance provides models for inter-organizational governance structures. In the future, we can expect to see organizations learning how to spawn and collaboratively and efficiently govern many dispersed and often temporary activities. This represents a continuation of the trend toward more lateral self-management in the organization.

Context-Building

Each dispersed project has a unique configuration of activities and participants. The project level context and the larger organizational and inter-organizational contexts in which the project is embedded are also unique. Thus, managers and project leaders and participants need to learn to create effective performance contexts. The organizational design can no longer be simply the backdrop for work; it has to be intentionally crafted to house complex, virtual work.

Organizational level design features that affect lateral, distributed work include the information system infrastructure, communication norms and systems, planning, goal-setting, and budgeting processes, and measurement, review, and reward systems (Galbraith, 1994). These systems provide an integrative framework for a myriad of dispersed, multi-dimensional activities. When the dispersed team cuts across organizations, inter-organizational integration of these systems is required in order to align performers who don't fall within the same hierarchical structure.

These contextual features to some extent substitute for hierarchical control: they are the features that both connect teams to the larger business units in which the members are embedded and allow the teams to operate in a loosely coupled manner. For example, strategy, planning, and goal-setting processes are important for all lateral structures, for it is through these mechanisms that various units become aligned with the overall business direction and have a clear framework within which to make trade-offs and guide their own activities (Cohen, Mohrman, & Mohrman, 1998). Information sharing ensures that the team has the necessary knowledge of events in each organizational unit to make informed decisions that take their context into account. These factors are even more important for dispersed teams because

relying on the process of hierarchical control and decision-making is much too cumbersome given the complexity of the hierarchical structure and the dynamic nature of the environment.

Project participants must also craft a within-project context. This context includes internal norms, processes, and structures for coordination and collaboration, working across cultural and discipline divides, and for self-management. As projects go through various stages and different participants become involved, the context is reshaped continually. The tools of project management increasingly include organization design.

Managers and leaders in the effective teams in our studies had gravitated away from day-to-day management of team member activities. They spent time building contexts for effective performance. Contextual features were the determinants of team performance. Classic managerial variables dealing with the dyadic relationship between managers and subordinates explained very little of the variance in performance. In the future, project management will be a key managerial competency, and all managers will have to know how to build organizational contexts and temporary systems.

Lateral and Vertical Context Management

In addition to the new behaviors and competencies required to effectively operate within distributed teams, the members of these teams will have to become quite good at managing their complex contexts. Distributed team members often have additional responsibilities outside the team and often as members of other teams as well. They have to become comfortable with the ambiguity and uncertainty of juggling multiple priorities with no one clear source of direction about what are the most important activities. They have to be able to negotiate a path through a

complex maze of loosely coupled or uncoupled activities and demands on their time. In a sense, each individual is a supplier of services, juggling multiple commitments.

Teams have to manage their relations laterally as well as with multiple hierarchies. Often the interdependencies inherent in knowledge work extend beyond a particular team.   Minimally, other teams are the source of important knowledge content. Multiple teams may also be vying for scarce shared resources and consequently coordination is required. The various participants in a distributed team operate within different organizational contexts, and the team is dependent on support and cooperation from each. Keeping "all the ducks in line" is a major concern, and requires negotiation and collaboration skills as well as a project management approach that includes ongoing alignment of needed contextual support in order to ensure that the team can operate without external interference.

Human Resource Systems

Traditional human resource systems have been crafted to support hierarchical functioning and are based on the assumption that work is done within a particular organization. Career paths have largely been viewed as vertical movement through an organization. Performance management systems have largely used the supervisor-subordinate relationship as their core building block. Job assignments have been within a particular organizational unit and setting. Compensation has been geared to particular jobs within particular organizational structures. Team and organizational rewards, when they exist, often target the performance of a particular business unit or team within it.

Individuals working in dispersed teams can feel at risk when such traditional approaches prevail. Their work may not be salient nor perhaps even visible to their supervisor or even to others in their business unit. The project may be of relatively low priority to the business unit in which they are located but of high priority in the larger business context. Their assignments may not fall neatly within the job structure of their own organization.

As dispersed teams become more prevalent, organizations will have to find ways to plan job assignments, assess competency and value, provide feedback, and reward units that do not depend on the traditional supervisory structure as the agent of performance and career management. We can expect to see an increasing use of reward structures that are project specific and link together members from diverse businesses. Individuals will develop portfolios of experience and project-based assessments that will become the basis for job assignments through processes that resemble market mechanisms more closely than traditional hierarchically controlled people movement. These mechanisms will increasingly extend across business units

within a corporation, and may even start to extend across multiple organizations that have teams that cut across them.   Thus, the attachment of people to their company will be through the projects of which they are a part; those projects will also provide a forum for applying one's competencies that is relatively detached from day-to-day concern with vertical hierarchical person management. One's accomplishments and the accomplishments of the projects will be the basis for further opportunities.

This change will also have profound implications for roles and relationships in the organization. Managers will truly become managers of activities rather than people. Self-reliance and self-management will be critical to career success. Business units will no longer "own" their people—rather, mechanisms will develop to facilitate the application of people's talent to projects that extend across the corporation. Locations will house people and provide administrative support, but direction, resources, project management and co-workers may come from anywhere.

Conclusion

For compelling business reasons, geographically dispersed, multi-organization project teams and networks are becoming increasingly prevalent in many organizations. These structures exist in multiple organizational and often cultural contexts, and entail a dramatically more complex set of operating constraints than is true for project teams located together in the same organizational unit. For these dispersed structures to deliver on their business potential, organizations will have to build contexts that at the same time link these teams to the multiple

business units of which their members are a part and umbrella them from daily interference by these business units.

Dispersed teams and networks are a way of organizing work that challenges many of the assumptions and approaches of the traditional hierarchical business model. New lateral forms of governance are required, as well as systems and contextual features that enable work to occur with relative ease across boundaries. These new forms in turn will have significant implications for organizational behavior and for human resource management approaches because they challenge the traditional attachment of people to the organization primarily through well-defined jobs and supervisor-subordinate relations.

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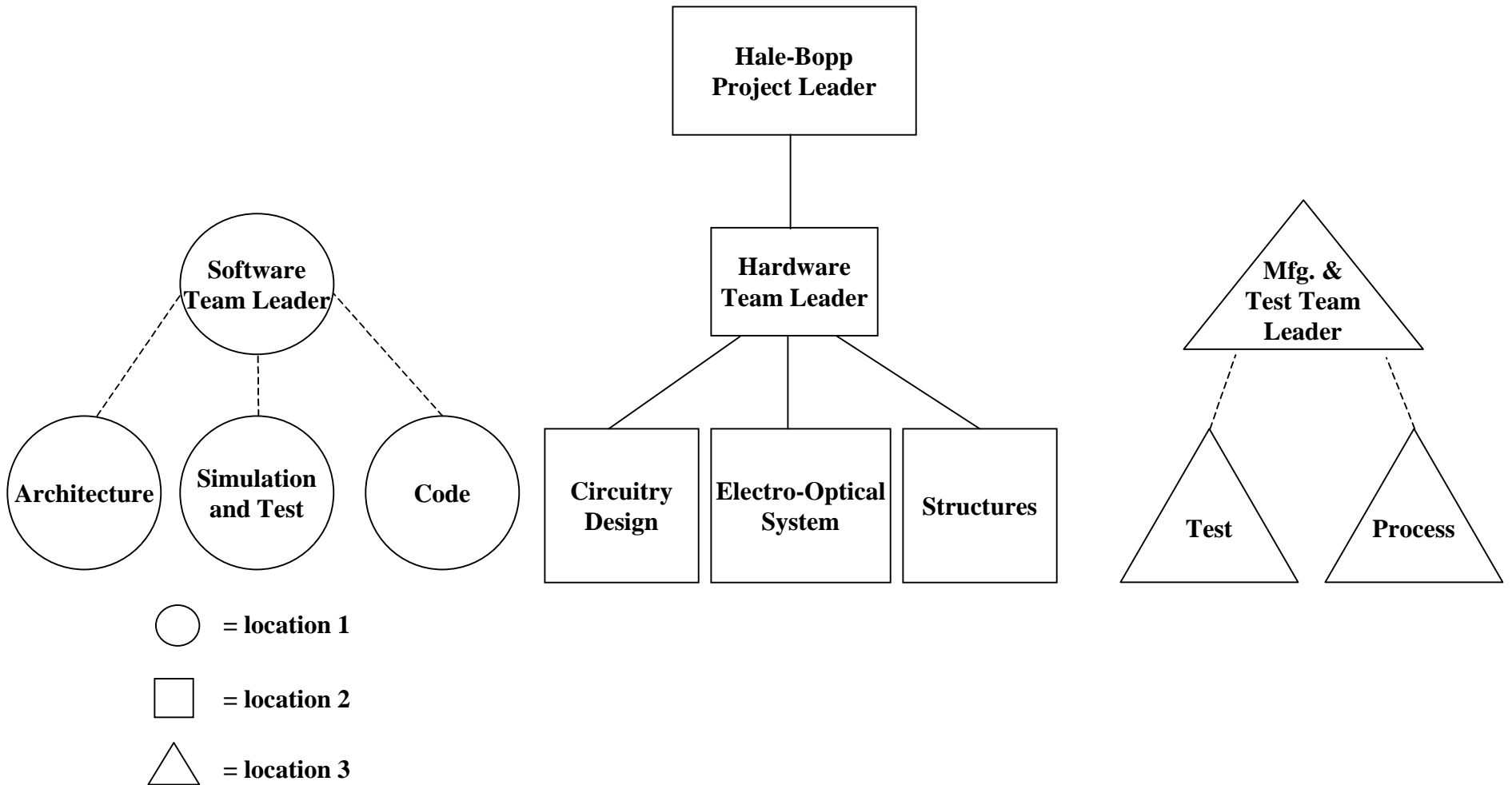
Figure 1

Distributed Team
"Hale-Bopp" Project

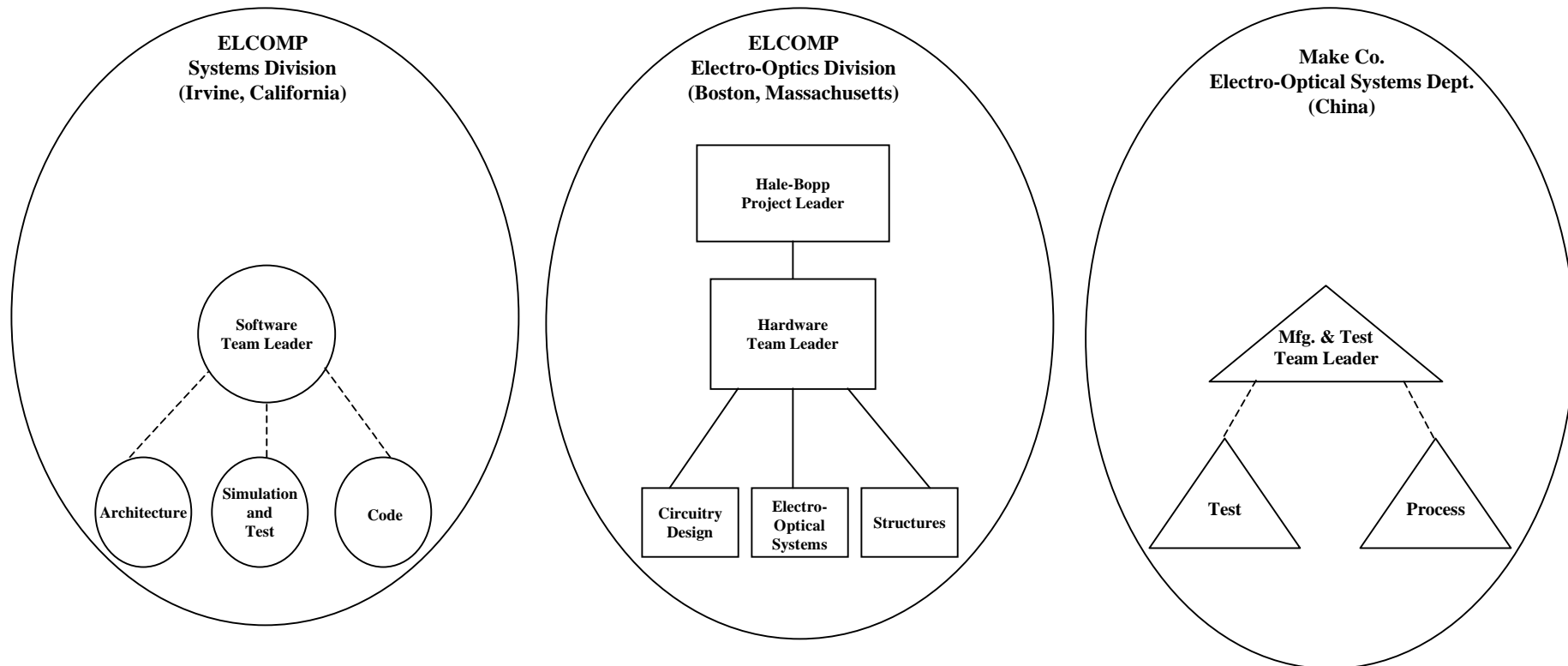# Figure 2

Distributed Hale-Bopp Team
Nested in 3 Businesses

Figure 3

Distributed Hale Bopp Team Nested in 3 Business Structures

V.P. General Manager ELCOMP

ELCOMP Division A

Division General Manager

Software Director

- Manager Software Architecture
- Manager Test and Simulation
- Manager Software Programming

Software Team Leader

- Architecture
- Simulation and Test
- Code

ELCOMP Division B

Division General Manager

- Director of Engineering
- Director of Programs

- Manager Electrical Design
- Manager E/O Systems
- Hale-Bopp Project Leader
- Manager Structural Engineering

Hardware Team Leader

- Circuitry Design
- Electro-Optical Systems
- Structures

Make Co. General Manager

- Vice President Programs
- Vice President Engineering

- Director Partner Programs
- Director Electro-Optical Systems

Manager Electro-Optical Systems

- Manager Test Engineering
- Manager Projects
- Manager Process Engineering

- Supervisor Test Engineering
- Mfg and Test Team Leader
- Supervisor Process Engineering

- Test
- Process

○ = Irvine   □ = Boston   △ = China