

**Hanna Toiviainen**

# **LEARNING ACROSS LEVELS**

Challenges of Collaboration  
in a Small-Firm Network

*Academic dissertation to be publicly discussed,  
by due permission of the Faculty of Education at the University of Helsinki  
in the Festivity Hall at the Department of Education  
on November 14, 2003 at 12 o'clock*

University of Helsinki  
Department of Education





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## LEARNING ACROSS LEVELS

Challenges of Collaboration in a Small-Firm Network

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## Abstract

According to a generally held view, the rise of networks adds a new interorganizational level to the analysis of learning alongside individual, group, and organizational levels. In this study, it is argued that networks open up an alternative way of considering levels, not as predetermined and given, but as dynamic spaces for learning. Learning in networks as an interplay of levels is a highly contextualized and embedded phenomenon, to be explored specifically for each network setting. Consequently, the definition of levels becomes a major research task.

For small metal-working subcontracting companies in Finland in the 1990s, networks and networking presented a collaborative challenge, marked by the economic depression in the early 1990s, and by the concurrent reorganization of the subcontracting system initiated by the customer companies. Joint production became a new leading activity for horizontal collaboration among subcontractors. Pursuing production in networks was not, however, a straightforward undertaking. The formation of networks engendered a variety of activities directed at their own objects and outcomes of collaboration. By following the emerging objects within *the Club* network and its sub-networks, I found four levels of collaboration and learning, which I named the network-ideological level, the project level, the production level, and the worker level.

In the study of learning, I apply the cultural-historical activity theory and the theory of expansive learning. Besides emphasizing object orientation, this line of research leads to a consideration of the diversity of perspectives intersecting and confronting one another in networks. An empirical chapter of the thesis is devoted to each of the four levels.

My historical analysis of the Club network covers the years from 1991 to 1995. Participant observation covers the period between 1995 and 1999. The data consists of videotaped and audio-recorded network meetings, interviews, and interactions across the firms, complemented by archival documents and researcher's field notes. The data draws significantly on discursive materials.

The notion of levels of network activity contributes to the cultural-historical activity theory and to the theory of expansive learning in two main ways. First, by introducing the levels, I suggest a vertical dimension of intersecting levels to be integrated in the third generation activity theory, which has thus far been conceptualized mainly horizontally, in terms of multiple activity systems orienting towards a shared object. Second, embedding this vertical dimension in the cycle of expansive learning may enrich our understanding of the dynamics of the cycle, by introducing the idea of concurrent and contradictory movements of learning from above and learning from below.

Concerning the future learning challenges for the network and sub-networks I studied, the major finding of this study points at the emerging partnerships and partnering activity. A fifth level, the partnership level, seems to be needed for mediating learning from above and learning from below. This study anticipates a new phase of discussion on partnering, suggested by other alliance researchers, namely a shift of focus from alliance formation to alliance management and partnering competence. Cultural-historical activity theory may contribute to this discussion by elaborating the ideas of co-configuration, knotworking, and related concepts for articulating the learning challenge.

*Keywords:* cultural-historical activity theory, expansive learning, interfirm networks, learning in networks, levels of learning, subcontracting companies

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Were this academic dissertation the only outcome of the collaborative work I have done during the past years, it would be a far cry from learning across levels. I feel, though, that working on it has opened a window to multiple spheres of collaboration and learning. It is not yet the time to analyze the totality of my learning outcomes at various levels. However, it is appropriate now to thank the communities and people who co-constructed these levels with me.

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# 1 Introduction

## 1.1 A glimpse of the research object

This research started at the end of 1995. I had an opportunity to participate in a meeting, held by a dozen managers of subcontracting metal companies. These managers belonged to a group called *The Club*, founded by the members at the beginning of the decade. The Club represented to them a new type of network for enhancing interfirm collaboration. One of the topical issues was: How to introduce the Club to key customers in order to get large-scale orders (system supplying) instead of the traditional parts supplying?

### Excerpt 1.1

*Member 1:* It is a real struggle to convince the customer that “hey, give the job to the Club.” There are certainly others out after the same thing. It is the challenge of the coming months: to convince them [the customer] to give the Club some orders.

*Member 2:* I don’t believe they’ll give any jobs to the Club, but to us, their approved subcontractors who belong to the Club. This way we can raise awareness of the Club and build trust with the customer when talking about it. But they won’t be giving anything to the Club at this stage.

*Member 3:* Yeah, because the Club isn’t manufacturing organization.

*Member 4:* Yes, and that’s why I have been talking about “the Club coalition.” And now the question is: Through which firm or firms is this coalition going to act?

*Member 3:* That’s the big issue; that in terms of larger system supplying we should gain trust in our ability to master projects. We are, as already said, makers of single parts, but we lack [thus far] a showcase and organization. We must show that this [cooperation] works and the responsibilities are like this and...

*Member 2:* But isn't the fact that when we find the right person [in the customer's organization] who can tell us what they are ready to outsource, we shall learn what we could perhaps get from them? And after that we'll consider which firm in our group is the most suitable to receive the job. It depends on the job they are offering. We'll give it to the most suitable member.

*Member 4:* We are dealing with the right person and the like all the time. But what [Member 3] said about the ability to master projects is also important. It is certainly something that will impress them over there: We'll tell them that we can master the project from the very beginning to the end, and control the testing and installation. After that the right person...

[##Murmuring: *Member 5:* But we don't have the wherewithal yet.

*Member 3:* To carry out projects?

*Member 5:* Yeah.

*Member 3:* Oh, all right.]

*Member 6:* ## Let me tell you about the case we started in our firm last year in February...

(Meeting 11/95)

In this piece of discourse, the participants are conceptualizing the customer relationship of the Club. Simultaneously, they are conceptualizing and making sense of the Club itself. Several themes emerge, pivoting around different aspects of the collaborative activity: What is the level of collaboration through which the members endeavor to develop customer relationships - that of the Club-coalition, of a single subcontracting firm, or of persons? What is the object of collaboration the Club is aspiring for - system supplying, project work, or still something else? Finally, as a precondition for good customer relationships, how is the Club going to build the trust, share the responsibilities, and organize the production work? Can it rely solely on the status gained by its member companies in this respect?

A careful reading of the discourse reveals different perspectives on the collaboration. These perspectives are partly complementary, partly conflicting and tension-laden in relation to each other. Encountering these perspectives and solving emerging tensions and problems bring about learning challenges for the collaborating parties. Consequently, I will claim in this study that by analyzing this kind of problem solving at different levels of networked collaboration, we can gain an understanding of learning in networks.

Finally, at the end of the excerpt 1.1, one of the members starts to tell about a specific customer case as experienced by his firm. Learning from others is one

of the factors which feed interorganizational collaboration, often in invisible and tacit ways. This certainly holds true in the case of the Club. The motto for the entire research could run: “*Let me tell you about our case...*”

## **1.2 Why study networks of subcontracting companies?**

Networks were a most topical issue at the beginning of the 1990s in Finland. The modes of flexible production and network economy were seen as major challenges for the economic life and for the society at large (Ollus et al., 1990). The depression had led to hard lessons for firms as well as other actors in society. The formation of networks to serve different purposes was supported by the state administration and associations. This interest and accompanying development work and evaluation research was kept up throughout the 1990s (e.g., Murto-Koivisto & Vesalainen, 1995; Linkola, 1996; Kuivanen & Hyötyläinen, 1997; Koivisto & Ahmaniemi, 2001). The main motive for encouraging networking seemed to be the improvement of competitive capability, in particular, by helping firms to internationalize, the threshold of which was relatively high for small firms operating at a local level. The growing interest in networks was also observable in the appearance of academic dissertations dealing with interfirm cooperation within Finnish industries (Raatikainen, 1992; Eriksson, 1995; Hovi, 1995).

Internationally, some comprehensive publications appeared at the start of the 1990s showing the existence of an already vigorous research tradition on organizational and industrial networks in Europe as well as in United States (Axelsson & Easton, 1992; Nohria & Eccles, 1992; Sydow, 1992; Alter & Hage, 1993). Outcomes of the discussion on networks as a potentially new form of socio-economic organization beyond markets and hierarchies (Williamson, 1975) were gathered into a volume of selected writings (Thompson et al., 1991). Among these, Powell's (1990) article was one of the most influential historically-grounded analyses of the three modes of organization, markets, hierarchies and networks. As a distinct theme characterizing network relationships, trust was frequently emphasized in contrast to price mechanisms of markets and authority relationships of hierarchies (Bradach & Eccles, 1989).

Altogether, even though researchers were united on the importance of networks as a new type of organizing, little was known about the challenges networks placed on the actors involved. It was hard to assess to what extent the ongoing changes in organizing really challenged the parties involved to develop new capabilities and ways of running a business. Considering collaboration at



work, one of the most interesting questions was whether the still topical ideas of teams and teamwork, analyzed mainly inside organizations, were valid and applicable in a network context. Beyond intraorganizational collaboration, research was challenged to develop new conceptualizations for boundary-crossing, which meant reaching activities across and beyond the organizational boundaries.

Ever since 1995, when this research project started, network research has accumulated year-by-year adding to our understanding of network phenomena. Even the specific questions of learning, the focus of this study, have been addressed in numerous publications (see Chapter 2). This has not lessened the topicality of the theme, on the contrary. First, research has mostly been dealing with dyadic business alliances and joint ventures, which represent an important but still limited range of network phenomena. Only recently, the Club type networks have been recognized, characteristically gathering together several firms from the same industrial sector without having defined in advance a specific business target and strategy (Human & Provan, 2000). Secondly, despite having identified different types of networks with different developmental challenges, research has not been particularly successful in contextualizing these in their cultural-historical origins. Network typologies are commonly presented as universal structures and forms following universal dynamics. Finally, understanding *learning* in networks is still far from grasping the realities of the collaborating actors and the everyday problems they have to tackle. Ethnographies of sporadic learning situations are weakly linked to the learning challenges of the entire network.

Definitions of learning in networks accord generally with conceptualizations put forth by studies of knowledge management and organizational learning. In that vein, learning means knowledge acquisition and knowledge creation in collaboration across organizational boundaries. However, the concept of knowledge in the learning context is not unproblematic, as shown by recent critical analyses (Argote, 1999; Prichard et al., 2000; Human Relations, 2001)<sup>1</sup>.

In this study, I maintain that cultural-historical activity theory has potentials not yet fully exploited in network research incorporating the themes discussed above. This applies in particular to the cultural-historical line of thought (e.g. Cole & Engeström, 1993) and its application called Developmental Work Research (Engeström, 1987). Within this tradition, network analyses have been used in learning research focusing on teachers' work (Kärkkäinen, 1999), health care work (Kerosuo, 2003), research work (Miettinen, 1998; Saari & Miettinen,

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<sup>1</sup> Empson (2001) discerns two alternative perspectives, one commodity-like view pursued by economics, *Knowledge as an asset*, the other social constructionist view within sociology, *Knowing as a process*. It will be argued here that in both cases the *contents* of knowledge and its linking to the *object* of collaborative activity remain open in most of the research.

2001), producer-user interaction in technological innovation processes (Miettinen & Hasu, 2002), and expert groups in high technology (Blackler et al., 2000), to mention a few. The activity-theoretical contribution to network studies will be elaborated in detail in Chapter 2. A quote provides a concise characterization of the starting point:

Activity theory regards a historically-formed, local activity system (or a community of practitioners) as the basic unit of analysis. Correspondingly, it studies an innovation network as a network of activity systems. Any activity system is itself a hybrid comprised of subject, object, signs and tools, community, rules and division of labour. (...)

In the activity-theoretical approach, the interrelationship of the systems of tools and knowledge to the object to be constructed is essential. The development of a network is not analyzed primarily in terms of persuasion and power, but in terms of the cultural resources the participating activities mobilize in the construction process, and of the learning associated with this collaboration (Miettinen, 1998, p. 53).

### **1.3 The Club**

The Club was founded in 1993 as a networking forum for subcontracting firms in the Finnish metal-working industries. Of seventeen founder companies, four opted out soon after the formation while thirteen stayed on (Table 1.1). The number of member companies had increased to twenty-two in 2002. The initiative, as well as the founding process of the Club, were obviously affected by the general interest in networks at the beginning of the 1990s. The Club was not created to carry out a predefined business task among the members. Rather, it was inspired by the anticipated potentials of new forms of the interfirm collaboration.

Administratively, the Club took the form of a registered association, which implies certain obligations regulated by law. The Club is chaired by a president and a board, both elected among the members for two-year periods. The association holds ordinary annual meetings required in the bylaws. Beyond the legal obligations, the Club hired a fulltime coordinator to organize the joint activities.

**Table 1.1** Founding companies of the Club (The Club brochures 1995 and 1998); FIM (Finnish mark) = 0,19 U.S. dollars (September 2003)

Firm	Description (year of foundation)	Annual sales Million FIM		Personnel	
		1995	1998	1995	1998
1	Heat and surface treatment (1989)	29	39	57	65
2	Industrial design, graphic design and corporate image designs (1981)	3	3	6	10
3	Stainless steel sheet work; design and product development, solutions for materials handling, mixers, cutters, dumping equipment, sorters, washers for foodstuff industry, institutional kitchens and hospitals (1949)	16	25	27	30
4	Design and manufacture of thin-walled, seamless metal components by sheet forming (1896)	20	28	48	55
5	Mechanical subcontractor to electronics and electromechanical or engineering industry (1973)	16	30	40	76
6	Design of electrical wiring, mechanics, and machines; control systems, manufacture of components for electrical industry (1980)	28	56	56	100
7	Mechanical engineering, components of machines (1946)	6,5	7	16	16
8	Engineering company, design and manufacture of post production handling systems for the graphics industry, precision subcontracting for larger engineering workshops (1968)	22	28	38	45
9	CNC-machining, own products (1946)	9,5	14	23	30
10	Gearwheel and transmission manufacturer; design and production of toothed and worm gears and other precision components for space technology, biotechnology, computer technology, industrial automation and robotics (1979)	40	60	75	100
11	Manufacturing company, designing and producing machines, equipment and machine tools for automation and mechanization, electrically powered ice resurfaces, automatic assembling machines and lines (1992)	16	25	40	46
12	Spring manufacturer; tool manufacture and tool maintenance (1941)	42,5	65	63	90
13	Design and manufacture of machinery, equipment and steel construction for processing industries, mechanical wood industry, and pulp and paper industry (1979)	11	8,5	30	20

To bring about a versatile group, the Club recruited some of its members from branches supplementary to the metal subcontracting, such as engineering and design. The member companies were, and are, geographically scattered in the Helsinki district, as well as in other parts of Finland. The horizontal aspect of the group is emphasized by the fact that there was no single main supplier common to these firms. Finally, a feature to mention is that the initiative for founding the Club came from the academic world, motivated by certain ideals of interfirm networking (Eräheimo & Lahti, 1993). The transitory shift of the emerging activities from the outside initiators to the actors of the subcontracting firms brought about developmental tensions energizing the early learning experiences, as will be shown in the historical analysis in Chapter 5.

The birth of the Club was preceded by a thorough planning process, during which the participants weighted their motives for founding and joining a group of a kind they could hardly foresee. The outcome, the founding of the Club, was an organizational innovation without an existing model on Finnish soil. Due to the deliberateness and novelty, the founding of the Club may be interpreted as a manifestation of conscious and collaborative learning actions by its members.

#### **1.4 Structure of the study**

Chapter 2 brings forth a critical review and analysis of theoretical approaches to learning in networks. The activity-theoretical agenda for this study is presented and discussed. This chapter forms the generic methodological framework for the empirical analyses.

In Chapter 3, I look for the “roots” of interfirm collaboration among Finnish metal subcontracting companies. The aim is to identify the key phenomena necessitating collaboration at different phases of the post-war period, thereby suggesting specific learning challenges for each period up to the phase covered in this study.

The main research questions are formulated in Chapter 4. They are accompanied by a preliminary presentation of the empirical case studies and methods applied.

Chapters 5 to 8 include the results of the empirical analyses based on the data gathered from network activities during four years, from November 1995 to August 1999. Chapter 5 works out the historical phases of the Club. As the outcome, a model for analyzing learning in networks is proposed, drawing on activity-theoretical resources discussed in Chapter 2. The model displays four levels of collaboration and learning in interfirm collaboration, the network-ideological level, the project level, the production level, and the worker level. This model is used

and elaborated in the rest of the study. Chapter 6 deals with the project level, continuing the study of the Club's history, now focusing on the efforts of modeling joint activity directed at customer projects. Chapter 7 shows how network collaboration was implemented and learned at the production level, managed by one Member Company. Chapter 8 addresses the worker level of learning in the context of an alliance of five small firms. *The Alliance*, originating from collaboration within the Club, carried out a developmental project including a researcher-initiated intervention on workers' networks.

Chapters 9 and 10 form the concluding part of the research. The summary of and discussion on the major findings are found in Chapter 9. The questions of validity and the researcher's role and learning are examined in Chapter 10.

## 2 Learning in networks as object of research

### 2.1 Introduction

Powell, Koput and Smith-Doerr (1996) have pointed out that the increasing number of partnerships and connectivity of firms elicit two processes of learning occurring simultaneously and recursively.

First, firms are increasingly using ties *to enhance the inflow of specific information, resources, and products*. Second, firms are becoming much more *adept at and reputed for the general practice of collaboration* with diverse partners (Powell, Koput & Smith-Doerr, 1996, p. 143; italics added).

Two distinct but parallel objects of learning are perceived: “information, resources, and products” and “general practice of collaboration.” In other words, *learning-in-networks refers to the socio-material collaborative processes implying the double learning of both of these aspects, which I will call “learning-through-networks” and “learning-to-network.”* This notion is certainly not limited to new biotechnology networks studied by Powell, Koput and Smith-Doerr. For instance, Deakins and Freel (1998) name *learning through networks*, articulated by industrial-districts theory and small-firm-networking theories, as a potential source for understanding entrepreneurial learning. Drawing on case studies, they then identify the *ability to network* as one of the critical factors of the process of entrepreneurship and point out that “[w]ithout existing contacts, it is important that entrepreneurs learn to network quickly in their industry at an early stage [of starting enterprises, HT]” (ibid., p. 150).

Interorganizational learning in a network context has attracted a lot of academic interest during the 1990s, which is reflected in numerous and heterogeneous studies on the subject. Certain confusion on this field of research stems partly from the fact that the two learning processes mentioned above are lumped

together, without reflecting on their differences and connections. Despite some elaborated models, there are numerous analyses in which the concept of learning is taken for granted, not critically examined.

In management studies, learning is mostly seen either as a metaphor for overall change and evolution of a network in the course of time or as a by-product of business transactions. It is implicitly stated that knowledge transfer or the success of a network, as such, signifies learning. “In most accounts of how knowledge is acquired in work organizations, learning tends to be identified with whatever features and activities managers deem or expect to be functionally beneficial” (Contu & Willmot, 2000, p. 269).

The starting point of this chapter is that, in order to contribute to the theories of learning, analyses should at least try to answer four basic questions (Engeström, 2001a): (1) *Who* are those proposed to learn in networks? (2) *Why* do they learn? (3) *What* do they learn? (4) *How* do they learn in networks?

I will examine five studies of learning in networks, each representing a somewhat different approach to the domain. In particular, I looked for *analyses of interfirm networks in industrial settings*, dating from the period of my own research project. The selected studies were published between 1993 and 1999. All of them are articles published in international journals and frequently referred to in network studies. In addition, they are studies that present both a theoretical model of learning and empirical cases on collaborating companies.

Beyond these selection criteria, I did not attempt to achieve overall representativeness. Good and comprehensive reviews of learning in networks can be found in numerous articles (Beeby & Booth, 2000; Dierkes et al., 2001). My discussion is aimed at a thorough analysis of the concept of learning, something that seems to be absent from the studies thus far.

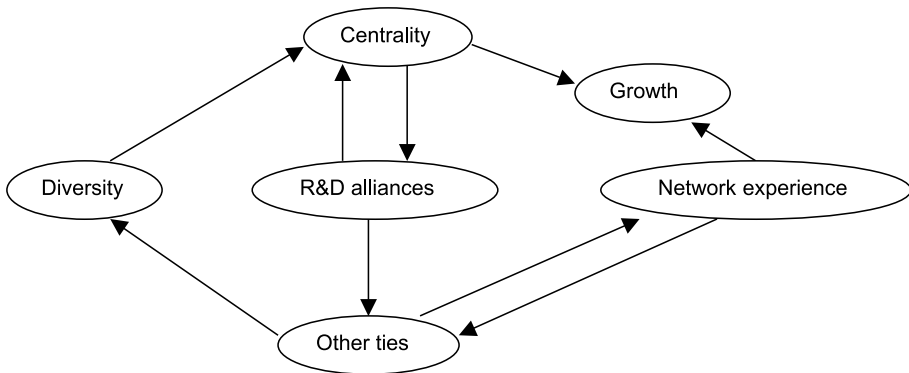
In section 2.3, each of the four learning questions is examined, followed by an intermediate conclusion on what we know about the question on the basis of the existing research and what needs to be further elaborated. After examining the learning questions in light of the selected studies, section 2.4 introduces the activity-theoretical perspective and discusses the contribution it might offer studies of learning in networks.

## **2.2 Five studies of learning in networks**

Dodgson’s article “Learning, Trust, and Technological Collaboration” (1993), in the author’s words, “provides an early attempt to examine the question of trust among firms collaborating in their technological activities” (ibid., p. 92). It addresses newly established firms and dyadic alliances in biotechnology. Dodgson

did not aim at formulating any coherent theoretical model of learning<sup>2</sup>. On the other hand, the article contains some methodological implications which deserve more critical attention, such as the move from interpersonal to interorganizational trust, the tensions and problems involved in interfirm linkages, and seeing trust constituted by the technological and commercial logic of collaboration.

In the paper entitled “Interorganizational Collaboration and the Locus of Innovation: Networks of Learning in Biotechnology,” Powell, Koput and Smith-Doerr (1996) show the limits of the transaction-cost-economic approach. Rather than seeing firms with their diverse sets of resources as complementary and therefore seeking somewhat risky relationships with external partners, they argue that “when the knowledge base of an industry is both complex and expanding and the sources of expertise are widely dispersed, the locus of innovation will be found in networks of learning, rather than in individual firms” (ibid., p. 116). They further emphasize the heterogeneous and partly unforeseen pathways of learning, accruing multiple learning outcomes, as already mentioned at the beginning of this chapter. The “Cycles of Learning” model resulting from the analysis is shown in Figure 2.1. Sharing the same industrial domain with Dodgson, namely biotechnology, they refer to his article when pointing out that collaboration is known to enhance organizational learning (ibid., p. 117).



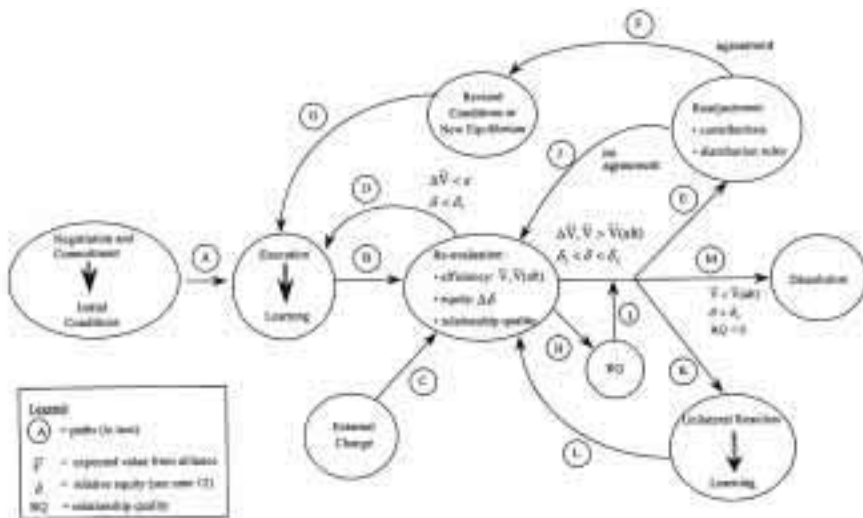
**Figure 2.1** Cycles of learning by Powell, Koput and Smith-Doerr (1996, p. 138)

Ariño and de la Torre (1998) take a different perspective in their article “Learning from Failure: Towards an Evolutionary Model of Collaborative Ven-

<sup>2</sup> Dodgson has elaborated many of the ideas presented in this article in his later work (e.g., Dodgson, 1996). However, it is beyond the scope of this review to present each researcher’s work comprehensively, even though they would fully deserve it.



tures.” The analysis of failure in networks represents a distinct research orientation among network studies (Miles & Snow, 1992; Human & Provan, 2000). Integrating the findings of Ring and Van de Ven (1994) and Doz (1996), the authors develop a model of evolution of the collaboration process in partnerships and alliances, in which learning is foundational (Figure 2.2). They suggest that a renegotiation process between partners provides an equity boundary that defines tolerable deviations from equity conditions. When this renegotiation fails in the absence of trust and goodwill, the alliance will flounder. The evolutionary model focused on the initial conditions of collaboration, as well as the critiques of the traditional economic view, resemble the approach of Powell, Koput and Smith-Doerr. However, Ariño and de la Torre do not refer to their article. The authors claim that little attention has been paid to the collaboration process in alliance evolution, and see the paper of Larsson et al. (1998) in the same journal issue as an important exception to this trend (Ariño & de la Torre, 1998, p. 307).



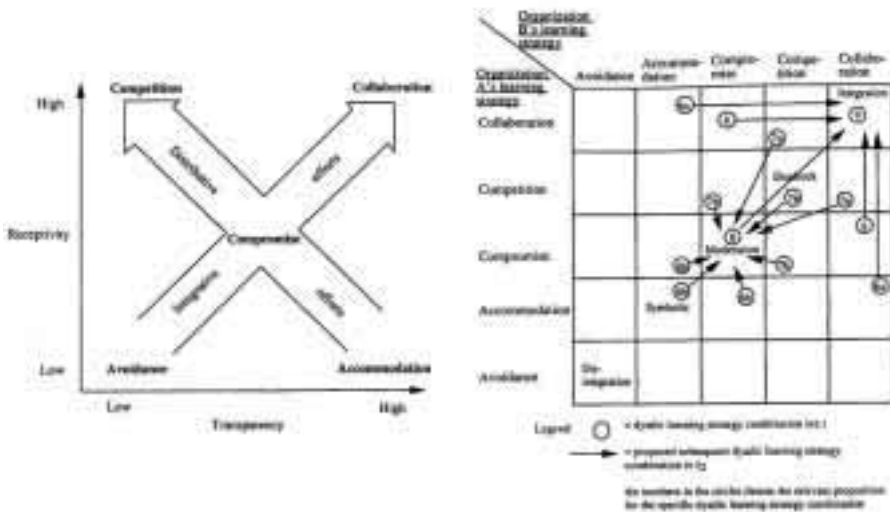
**Figure 2.2** Collaborative Venture evolution by Ariño and de la Torre (1998, p. 320)

Larsson, Bengtsson, Henriksson and Sparks (1998) address “The Interorganizational Learning Dilemma: Collective Knowledge Development in Strategic Alliances.” The dilemma represents “the poor choice of either exploitable ‘good partnership’ or self-defeating learning races” (ibid., p. 286)<sup>3</sup>, which the authors

<sup>3</sup> The learning dilemma is drawn from the “good partner” fallacy, that is, firms with high transparency and collaborative intent are easily exploited by more selfish partners, and from the learning race fallacy assuming that competition to win at the expense of others can detract efforts to produce a better joint outcome (Larsson et al. 1998, pp. 287, 288).

wish to transcend. “By synthesizing strategic alliance, organizational learning, collective action, and game theories” (ibid., p. 285), the authors suggest a framework of individual organization’s strategies for interorganizational learning. The framework is developed by combining Hamel’s (1991) receptivity and transparency dimensions with the integrative and distributive dimensions of Thomas’ (1976) conflict behavior model (Figure 2.3, left).

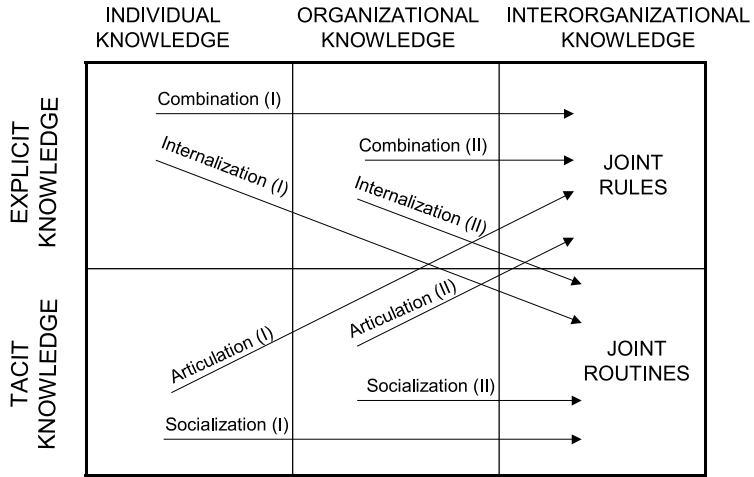
The authors extend it to a more dynamic longitudinal analysis of joint learning outcomes and barriers in the interaction of dyadic alliances. This part of the analysis generates a framework for empowering interorganizational learning dynamics (Figure 2.3, right). Larsson et al. make reference to all three studies above and see them as supportive to their own starting points and propositions.



**Figure 2.3** Left: Individual strategies for interorganizational learning; Right: Proposed empowering interorganizational learning dynamics by Larsson et al. (1998, pp. 289, 294)

Holmqvist’s paper “Learning in Imaginary Organizations: Creating Interorganizational Knowledge” (1999) builds on the findings of earlier network research, including the work of Dodgson (1993), Powell et al. (1996) and Larsson et al. (1998). In contrast to the evolutionary and game-theoretical tones, Holmqvist elaborates Nonaka’s and Hedlund’s (1991) model of knowledge conversions by adding the interorganizational dimension (Figure 2.4). He employs the concept of imaginary organization to exceed the limits of the prevailing image of collaborating partners as separate organizational entities, “while in fact value-making

and learning in contemporary partner collaborations are without boundaries...” (ibid., p. 420). Methodologically, Holmqvist is interested in developing a unit of analysis that would connect individual actions and interorganizational knowledge creation.



**Figure 2.4** Framework of learning in imaginary organizations by Holmqvist (1999, p. 428)

To summarize, the studies of learning in networks selected to this analysis are displayed in Table 2.1.

**Table 2.1** Five studies of learning in networks

<b>Study</b>	<b>Theoretical framework</b>	<b>Empirical case study</b>
Dodgson (1993): Learning, Trust, and Technological Collaboration	“... preliminary examination of some of the difficulties and constraints of developing external learning capabilities, and the role [interorganizational; HT] trust plays in facilitating these.” (ibid., pp. 90, 91)	Two examples of successful technological collaborations
Powell, Koput & Smith-Doerr (1996): Interorganizational Collaboration and the Locus of Innovation: Networks of Learning in Biotechnology	“... firm-level, longitudinal hypotheses that link research and development alliances, experience with managing interfirm relationships, network position, rates of growth, and portfolios of collaborative activities.” (ibid., p. 116)	Sample of dedicated biotechnology firms in the years 1990-1994
Ariño & de la Torre (1998): Learning from Failure: Towards an Evolutionary Model of Collaborative Ventures	“... a model of the collaboration process in partnership and alliances based on earlier work by Ring and Van de Ven (1994) and by Doz (1996).” (ibid., p. 306)	Interaction between two partners of a failed joint venture
Larsson, Bengtsson, Henriksson & Sparks (1998): The Interorganizational Learning Dilemma: Collective Knowledge Development in Strategic Alliances	“By synthesizing strategic alliance, organizational learning, collective action, and game theories, the framework contributes to understanding the variety in alliance development, performance, and longevity.” (ibid., p. 285)	Comparison of previous case studies and surveys of interorganizational learning
Holmqvist (1999): Learning in Imaginary Organizations: Creating Interorganizational Knowledge	“The imaginary organization... as an arena for creating interorganizational knowledge through eight modes of knowledge conversions, which are derivatives of two stores of knowledge, namely individual knowledge and organizational knowledge.” (ibid., p. 435)	Imaginary organization of Scandinavian PC Systems

## 2.3 Four learning questions

### 1) Who are the learners in networks?

The question of learning subjects in networks is related to the discussion among the organizational learning theorists on the *levels of learning* (Beeby & Booth, 2000). Researchers have discerned levels of aggregation such as individual, team or work group, interdepartmental, organizational, and finally, along with network studies, interorganizational level. The introduction of interorganizational learning seems to have stimulated this approach lately (in Finland, Vesalainen & Strömmer, 1999).

The notion of levels has grown out of a need for understanding and conceptualizing collective learning phenomena, observed beyond individual learning. Beeby and Booth (2000) point out that even though the interactions and learning dynamics across the levels are acknowledged among the researchers, there is a lot of controversy about the implications these notions bring to (inter)organizational learning. How do the studies reviewed identify and locate agencies and subjects of learning?

At first glance, the question of who are learning in networks seems easy to answer: it is firms, operating amidst uncertain and turbulent technological and market changes in various industrial domains. During the 1990s, it was particularly the biotechnology and information technology firms that were in the focus of interest. Strategic alliances, joint ventures, and other collaborative arrangements were emerging between universities, teaching hospitals, large multinational firms and small, dedicated biotechnology firms (DBFs) (Dodgson, 1993). Dodgson's case represents a British DBF, while Powell et al.'s sample of biotechnology firms is largely U.S. based. Ariño's and de la Torre's case addresses a joint venture owned by two multinational companies (from North America and France) in consumer products industry, and Holmqvist's case presents a Swedish PC software manufacturer.

Considering firms as learners is not, however, a straightforward undertaking. Sometimes reference is made to the strategies of firms, sometimes to the actions and interactions of individuals, and still sometimes to an entire alliance. Several studies point to the important role of key individuals in the process of collaboration (Dodgson; Ariño & de la Torre; Holmqvist).

According to Dodgson (1993, p. 80), learning includes the ways *firms* build and supplement their knowledge bases. Learning is a complex concept, and it is important to analyze the ways in which learning is diffused throughout the firm. In fact, he addresses all levels from the individual to the interorganizational one, and urges a shift to be made from individual and interpersonal to inter-organizational or interpartner learning. Much of the literature on learning and

trust in collaboration is concerned with *inter-personal* relationships, he argues. However, these can break down. Dodgson summarizes, “[I]n order for the collaborations to continue successfully, as have the examples, then the trust relationships underpinning them also need to have their own dynamic and be engrained within organizations’ routines and practices” (Dodgson, 1993, p. 84).

In the analysis, Dodgson shows how the partnership initially created tension-laden scientific, commercial and political concerns. Emerging problems were settled by generating shared scientific culture for the partner organizations, and through agreements with provisions for funding and intellectual property rights (*ibid.*, p. 87). But these tensions arose every now and then between individuals in distinct projects, even as the problems of collaboration at an interorganizational level were being sorted out. Within the company, these episodes were described to the researcher as examples of “how, even when there is considerable experience in undertaking collaborations, and a convergence in expectations from both organizations about the form and benefits of these linkages, problems continually arise between (opinionated) individuals” (Dodgson, 1993, p. 87).

Dodgson (1993) sees collaboration as a process whereby “[b]onds between companies move beyond the personal and become administrative and legal (...)” (*ibid.*, p. 91). He prioritizes organizational (interpartner) learning outcomes - routines, norms and values - by means of which “collaboration can survive disruptive inter-personal rows” (*ibid.*, p. 91).

Powell, Koput and Smith-Doerr (1996) take up *networks of learning*, but derive *firm-level* hypotheses, based on their network approach to organizational learning. The authors pay attention to the increasing connectivity of the dedicated biotechnology firms. They further consider that the dynamics of learning involve the co-evolution of firms and networks (*ibid.*, p. 130). As a result of learning, both firm-level and industry-level practices are evolving, with boundaries becoming ever more permeable. “Firms opt for sustaining the ability to learn, via interdependence, over independence by means of vertical integration. This, in turn, promotes a sense of community-level mutualism (...)” (*ibid.*, p. 143). These aspects hint at the possibility of “co-learning” by firms and networks. However, the proposed learning model operates at a firm level. The authors conclude: “Nevertheless, the use of networks is not a guarantor of success. More work is needed before we fully understand the heterogeneous pathways firms take in our cycles-of-learning model and why some lead to visible indicators of success while others do not” (*ibid.*, p. 141).

Ariño and de la Torre (1998) address firms as learners: “A firm learns about its partner by interacting with it” (*ibid.*, p. 308). This happens through on-going re-evaluations of the efficiency and equity of the relationship. In the case analysis, the actors appear to be not only the firms themselves (NAMCO and Hexagon), but the joint venture’s (JVCO) executive committee and management

team, and partner firms' distributors, laboratories, board members, CEOs, and a retail division. The members of the joint venture's executive board are listed by name, and changes in that composition during the collaboration are reported. Otherwise, it is firms or sections of them that are mentioned as actors, individuals remaining in the background. In fact, an individual action is mentioned in a problem context where one of the external competitor firms had made a strong intervention into the NAMCO distribution system (event 8):

NAMCO's President, anticipating an adverse reaction from its partners, *telephoned personally the President of Hexagon to give him the news*, which was then communicated to other JVCO Board members. Hexagon executives were shocked. As one of them put it, "How could they let our most formidable competitor back into the market for a lousy \$1.5 million?" (Ariño & de la Torre, 1998, p. 318; italics added).

Larsson, Bengtsson, Henriksson and Sparks (1998) point out that, in order to understand learning among the cooperating firms, a shift from an organizational to an interorganizational level of analysis is needed in management research. Recent research provides the groundwork, "yet the primary unit of analysis is still the individual organization that learns from competitors or is locked in a 'race to learn' with its partners" (ibid., p. 286). Larsson et al.'s solution is to accentuate the dynamic interaction among the collaborating organizations, "extending the unit of analysis from merely the individual organization's learning strategy to the joint development of knowledge in *dyadic alliances*" (ibid., p. 290; original italics). Learning becomes "learning together" or "joint learning."

Holmqvist (1999) joins the widely accepted learning view already articulated by the preceding studies (Dodgson, 1993; Powell et al., 1996; Larsson et al., 1998): that an organization's learning and value-making are *embedded* in various forms of partnerships; "organizations can be seen as enduring alliances between independently knowledge-creating entities, be it individuals, teams, or other organizations (...), rather than independent actors racing to learn against everyone 'outside' the legal unit" (Holmqvist, 1999, p. 419). Holmqvist points out that a separation between an organization's individual and organizational knowledge is not exempt from problems. This represents a dilemma, indeed, which causes the researcher to waver between the entities:

Organizations learn when their knowledge in the form of rules and standard operating procedures are changed (...), though this change hinges on altered states of individual knowledge. Only individuals can actively learn; apart from learning between individuals in organizations, organizational learning is thus derived from transformations of individual knowledge into artificial memories and routines (Holmqvist, 1999, p. 422).

This line of thought is then extended to the interorganizational level: “To coordinate actions in imaginary organizations, not only must individual knowledge of the members be converted into the interorganizational knowledge, but also organization-specific knowledge of participating partners must be modified to the benefit of the collaboration” (Holmqvist, 1999, p. 427). Holmqvist studies information technology that, like biotechnology, has been frequently targeted by network research. In this sector, attention has been paid to long-standing manufacturing contracts and collaborative product development relationships (Saxenian, 1991). Holmqvist employs the concept of imaginary organizations to point out that these links do not exist in any legal manner, but live only through the interaction of the actors.

Holmqvist (1999) tackles the question of learning subjects at individual, organizational and interorganizational levels. Imaginary organizations learn through partner interactions resulting in the creation of interorganizational knowledge. The case study examples of this process make reference to actors such as partner firms, persons responsible for a given product, programmers, projects managers, tax experts and other experts, CEOs and other leading executives, and representatives of partner firms in general.

*Summary: Who are the learners in networks?*

The rise of networks has opened up an interorganizational level of learning to be addressed by researchers. Organizational learning (and learning organization) approaches grew out of the notion that collective processes cannot be understood solely in individual terms. Nowadays it is quite natural to state that firms are learning, as these articles do. In the same vein, it is seen that interorganizational activities bring challenges that need concepts of their own. Our understanding of this domain of learning is still in its infancy.

In addition to the firm level learning, the articles pay attention to the central role of individual key actors. There are “project champions,” “boundary spanners,” and “godfathers”. Dodgson (1993, p. 84) sums up: “Individual’s communication paths across boundaries is an essential element of all theories of organizational learning.”

Early studies, like Dodgson’s, emphasized the difference between individual and interorganizational processes<sup>4</sup>. But more and more it is thought that learning means ongoing transitions and interactions between the levels, and that

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<sup>4</sup> Recently, Knight (2002) has put forth a framework that clarifies the distinction between levels of *learner*, operating by means of the conventional levels (from individual to interorganizational). Differentiation is further made between network learning, interorganizational learning, and learning networks.



boundaries between the units are rather fluid. Holmqvist demonstrates this with his framework for knowledge creation. A generally held view by researchers is that interorganizational learning is achieved through gradual transitions from the individual level to more comprehensive levels of learning, and the outcomes are stored in shared knowledge repositories. What is missing from the analyses is the inclusion of the dynamics of the levels in the theoretical models. Holmqvist certainly addresses these dynamics, but not in terms of the learning subjects (*who?*).

Beeby and Booth (2000)<sup>5</sup> have suggested a model for “a network of levels of learning” by connecting each level with each other one. They present a complex and fluid pattern of two-way input/output transactions and feedback loops between levels. But the close texture of arrows does not explicate, first, how the transitions across the levels take place, and, second, how to recognize the level that actors are located on in each particular learning situation.

In sum, rather than accentuating the differences theoretical tools are needed to *mediate between individual (interpersonal) learning actions and the interorganizational learning*. The models of learning should be conducive to analyses of the *learning context in which the actions are embedded*, rather than taking the context as given (such as joint venture, imaginary organization, and network co-operation organization).

## 2) Why do they learn in networks?

The question of *why* partners learn - be they key individuals, firms or alliances - points to the motives for collaborative endeavors. In the case of interfirm networks, this discussion is carried out in terms of the needs and constraints attached to collaboration across organizational boundaries. What really makes partners take the trouble to network? Keeping in mind the distinction between learning-through-network and learning-to-network, this question addresses both the motives for *accessing knowledge and production* through networks and the motive for *attending and sustaining collaborative practices* in networks. It is also reasonable to look at how motives and needs, on one hand, are articulated empirically and, on the other hand, conceptualized theoretically.

First of all, the question of *why* actors learn in networks can be formulated at the historical level: What are the overall societal and economic challenges of industrial activity which necessitate collaboration? All researchers refer unanimously to rapid technological development under many uncertainties. The ar-

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<sup>5</sup> Beeby and Booth's (2000) study is purely a theoretical review, therefore not included in this analysis.

gument repeated in the studies with a reference to previous research is that the current developments have made it difficult for any one firm “to go it alone.” The key aspect seems to be access to knowledge through networks. Companies have to reach across the organizational boundaries. An excerpt from each study shows the similarities and slight differences in the reasoning (Table 2.2).

**Table 2.2** Why do they learn in networks? Perspectives of five studies

<b>Study</b>	<b>Why learning in networks?</b>
Dodgson (1993)	The turbulence and disruption facing industrial companies occurs in large part because individual firms in isolation cannot control these changes. (...) Technological change involves the need for an external orientation within firms to enable them to <i>learn</i> to detect and comprehend the extent of the <i>uncertainties</i> in their operating environment, and to begin to reduce them by accessing relevant and novel know-how (ibid., p. 78; original italics).
Powell, Koput & Smith-Doerr (1996)	At the core of this relationship is a vital need to access relevant knowledge: knowledge of a sort that is sophisticated and widely dispersed and not easily produced or captured inside the boundaries of a firm. These conditions are not limited to biotechnology. In fields as diverse as ceramics and software, much of the relevant know-how is neither located inside an organization nor readily available for purchase. When the sources of knowledge are disparate and the pathways of technological development uncharted, we would expect the emergence of networks of learning (ibid., p. 143).
Ariño & de la Torre (1998)	The complexity of organizational tasks required by technological acceleration and the rapid globalization of markets have made it increasingly difficult for any one firm to go at it alone in all product/markets of interest (ibid., p. 306).
Larsson, Bengtsson, Henriksson & Sparks (1998)	Strategic alliances have become a cornerstone in many corporations' attempts to achieve competitive advantages by gaining market access, scale economies, and competence development through collaboration (...). These collective benefits can be created faster, at less cost, with greater flexibility, and with less risk than “going it alone” (...) (ibid., pp. 285, 286).
Holmqvist (1999)	The growing number of partnerships in the business community may be interpreted as a response to insights among organizations, that partnerships may breed strategic learning possibilities and may function as competence alliances (...) This is already the case of the information technology (IT) industry, where competition is sharp as a razor, and where new products are constantly being created (ibid., p. 420).

Thus, it is the *firm level needs* articulated in interaction with partner firms that are addressed in the theoretical models of learning in networks. Holmqvist (1999) leads the discussion further by pointing out that the ongoing pooling of competencies from a multitude of relationships makes it “no longer fruitful to speak of organizations as having distinct ‘insides’ and ‘outsides’” (ibid., p. 425). The concept of a firm as an independent value-making entity is questioned by suggesting the concept of an imaginary organization to refer to such partnerships.

Dodgson (1993) describes the mutual needs and complementarity of technologies that partners were bringing into the alliance in Celltech’s two distinct partnerships with 1) U.K.’s Medical Research Center (MRC) and 2) American Cyanamid, a large U.S. pharmaceutical company:

1) Celltech - MRC

The partnership was built upon reciprocated need, and community of intent<sup>6</sup>. The MRC was under considerable political pressure to improve its technology transfer capabilities (...), and wished to build its links with industry. Celltech needed to access the novel skills of biotechnology which the MRC possessed in order to establish itself as a business. (...) Both partners were keen to demonstrate the industrial efficacy of the new and uncertain biotechnology (Dodgson 1993, p. 86).

2) Celltech - American Cyanamid

The contracts have focused on an area of high uncertainty and novelty: the R&D and manufacture of [antibodies] for the diagnosis and treatment of cancer. Celltech’s contribution of expertise lies in the ability to “engineer” antibodies to make them function more efficiently, in this case to “target” tumors. American Cyanamid’s expertise lies in toxins. The technologies are, therefore, highly complementary. Celltech’s antibodies are intended to deliver American Cyanamid’s toxins to the tumor (Dodgson 1993, p. 89).

Dodgson (1993) points out that his paper is limited to a preliminary examination of some of the difficulties and constraints of developing external learning capacities, and the role trust plays in facilitating these (ibid., pp. 90, 91). The conclusions, of course, can be seen partly as an answer to the question *why* companies continue collaboration in spite of these difficulties. Dodgson takes up two assumptions of learning and trust: first, that the technological and commercial logic of the collaboration remains and, second, that the relationship will necessarily be long-term (ibid., p. 91). Both points refer to the changes occurring over time in the focus and objectives of interfirm linkages.

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<sup>6</sup> Dodgson (1993) does not specify the meaning of “community of intent.”

Powell et al. (1996) do not address the motives for learning beyond the general level of industry, as cited in Table 2.2. This may be partly due to the emphasis on statistical data and methods which do not seem to allow for an analysis of “qualitative” phenomena, such as needs and learning challenges.

In Ariño and de la Torre’s (1998) description of the NAMCO-Hexagon joint venture (JV), the starting point is similar to Dodgson’s, who emphasized the mutual needs and complementary technologies: “Realizing their common interest in ecological cleaners and their complementary capabilities, they promoted the concept of a JV that would join resources and exploit this latent possibility” (ibid., p. 309). NAMCO had a strong manufacturing and distribution system worldwide, but lacked world-scale technical capabilities. It also had a history of failure in certain product introductions, which made management hesitant when facing the risks involved in the new product area. Hexagon possessed strong technical capabilities but lacked the distribution system.

Where Dodgson (1993) emphasizes the mutual needs and complementary capabilities as success factors, the case of ecological cleaners shows that the motives of the participants can change in the course of time in such a manner that the alliance finally flounders. The gradual change and divergence of the needs and purposes of the partners is shown through a narrative describing fourteen major events that transpired in the four years of observation. The divergence is described through the events, such as “Event 4: Shift in JVCO’s Strategy in Favour of Hexa-Care and Distribution Issues” (Ariño & de la Torre, 1998, p. 315) and “Event 9: Removal of Ready-to-Drink Diet Products from JVCO’s Portfolio” (ibid., p. 318). Finally, “Event 14: Dissolution of the Joint Venture” reports that:

... the partners’ interests were diverging. Hexagon wanted to pursue the ecological cleaners project, while NAMCO was more interested in opening the Asian-style skin care category. American Beauty [Hexagon’s partner outside the JV; HT] offered an alternative distribution system in North America and Europe for Hexa-Care. Hexagon’s brand weakness in the Asian product category diminished its relative value to NAMCO. As a result, the partners announced in September their decision to dissolve the JV as of December 1993 (Ariño & de la Torre, 1998, p. 319).

The authors thus claim that not only the change in the interests but also the appearance of second-best alternatives (NAMCO: a new product category for a new market area; Hexagon: another partner for a distribution system) to the current JV-arrangement weakened the partners’ motives for sustaining the collaboration.

Larsson et al. (1998) elaborate a game theory pay-off matrix that shows the interplay of the learning strategies adopted by two partners. Motivation for learning

is discussed in terms of the constraints and barriers as well as empowering factors for firms to adopt receptivity and transparency in dyadic relationships.

As to receptivity barriers, even if knowledge (“information”) is available, a recipient firm may not absorb it. Either it makes little sense to a firm that does not share the context in which the knowledge was created, or a firm lacks motivation due to disinterest, neglect or other priorities (ibid., p. 291). Transparency, on its part, can be constrained by a competitive organizational culture. Furthermore, there is the “shadow of the past” stemming from prior learning interaction, which means that historical choices of a firm affect future choices and capacities (ibid., p. 292).

Empowerment of learning is defined as “enabling both the motivation and ability of strategic alliance partners to develop their collective knowledge” (Larsson et al., p. 1998, 294). Accommodating organizations with low receptivity may be motivated through increasing learning stakes, especially in areas of their particular interest and high future potential. The motives of competitive but receptive organizations are strengthened by enhancement of interorganizational trust over opportunistic exploitation (ibid., p. 295).

Holmqvist (1999) examines the motives of the Scandinavian PC Systems (SPCS) for pursuing partnerships with companies specialized in computer programming. Programmers were expected to contribute with technical competence in developing products, that is, to program the products and to design their technical performance. “The reason why programmers were not employed [in-house; HT] was said to be due to fast technological development, which continuously required new skills, and the difficulty in keeping programmers within the company because of an attractive labor market” (Holmqvist, 1999, p. 431).

Another important partnership of SPCS consisted of experts, i.e. companies that possessed specialist knowledge about the contents of products, such as taxes and salary administration systems. The leading motive for knowledge conversions seemed to be “the joint value creation” exemplified by reflective interaction between a CEO of the programming company and an auditor coming from outside the actual partnership. The CEO is quoted:

I discussed everything with my auditor when he was here, and then the idea was born that auditors ought to have a tool that could control all their clients; suddenly something started to grow, which resulted in a program, the “client-integrator”. It hadn’t previously existed (Holmqvist, 1999, p. 435).

Holmqvist wants to show how this interaction added to the interorganizational knowledge, and how the auditor, who did not formally belong to the partnership, could contribute to the entire partnership’s value-creation.

*Summary: Why do they learn in networks?*

Of all four learning questions (*who, why, what* and *how*), this question seems to be best grounded in the research. Learning to network, learning to collaborate across organizational boundaries, is vital for organizations and their individual actors in order to keep business and production going amidst rapid technological change, competition, and knowledge creation. The objects of production and the nature of knowledge, involving new technologies in global economies, are too exacting for anyone to master alone, as the argument goes. Through the accumulated research we know about the challenges of different industrial domains, such as biotechnology, information technology, and various sectors of manufacturing industries. In addition, macro-level analyses have increased our insight into the overall historical needs for networking (Castells, 1996; Victor & Boynton, 1998).

The problem involved in the *why*-question is its exclusion from the learning models. Concrete and specific motives are systematically transformed into abstract concepts. A tendency towards universal models hides the rich array of motive-related concepts introduced in the studies. The need to produce ecological cleaners is substituted in the model by the need to gain efficiency and equity in a partnership (Ariño & de la Torre, 1998); and the interest to maintain the status of the leading manufacturer of standardized administrative PC programs is changed into joint value creation and knowledge building (Holmqvist, 1999), to cite some examples. I will elaborate on this in the *what*-question.

Another level of motive-related notions is composed of those concepts that describe the diversity of interests in and needs for collaboration and learning. It seems as if the researchers systematically avoided theorizing on the struggle of interests that, nevertheless, is frequently reported in the case studies. Mutual needs, complementary capabilities, initial conditions, empowerment, and joint value creation - all emphasize balance and the stability of a collaborative relationship. In the absence of these, problems will occur and a partnership will eventually dissolve. The position in regard to collaborative conflicts varies from the failure perspective, in the case of collaborative ventures (Ariño & de la Torre), to complete neglect, in the case of imaginary organizations (Holmqvist).

Finally, the analyses do not elaborate on the notion that being motivated to learn in and through networks does not imply that the needs are crystallized for the participants from the beginning. The motives for learning are in continuous transformation, as collaborative actions evolve through tension-laden interactions. The studies of joint ventures give an image of firms joining networks on the basis of rational calculation and consideration of the alternative arrangements. This is not the case in all types of networks, and, probably not even in

every joint venture. Regarding the period analyzed in this study, firms and individual actors might have been inspired by the general “networking boom” associated with an intuition-like notion that networks have something to offer to one’s business. This intuition was strengthened by the fact that networking projects were encouraged and financially supported by the society.

### 3) What do they learn in networks?

From the excerpts presented thus far, it can be read that firms are pursuing collaboration in order to access knowledge which becomes engrained in the repositories and routines of organizations. The researchers also pay attention to the fact that, through different kinds of interfirm practices and arrangements, partners learn collaboration and networking. But how do the articles manage to elaborate the meaning of these notions, from the point of view of learning? Each article approaches the issue of what is being learnt in a slightly different way.

Dodgson (1993) sums up the learning effects of the first case study (Celltech - MRC) by stating that both parties learned about the costs and benefits of collaboration: “Celltech has built its science and product base, the MRC has benefited financially, and its scientists have overcome their initial concerns about dealing with industry” (ibid., p. 88). Dodgson points out that this case exemplifies a transfer process of academic science into industry. This involves higher level learning “in that their collaboration affected change in the kind of organization they were” (ibid., p. 88), with Celltech adopting a new strategy of developing its own technology and the Medical Research Center collaborating successfully with industry. Dodgson concludes:

Trust, just as learning does in Hedberg’s sense, becomes engrained in organizational routines, norms, and values. It becomes part of the learned product of group experience that is culture (...). The shared scientific culture of the partners in the case studies, and the community of intent, facilitated the success of the collaborations (Dodgson, 1993, p. 91).

Powell et al. (1996) argue that firms learn from exploration and experience of how to recognize and structure synergies across different types of alliances. “An organization simultaneously learns which collaborations to pursue and how to function within a context of multiple cooperative ventures” (ibid., p. 121). One of their major notions deals with a positive, self-reinforcing circle of learning in networks. They claim: “(...) the dynamics of cooperation are endogenous in high-tech fields in which scientific advances fuel new discoveries that in turn

require novel forms of collaboration to develop” (ibid., p. 121). When collaboration stems from membership in a common technological community, partnering is routinized and occurs more readily, with less effort.

Powell et al. present a somewhat mediated conceptualization of learning. This implies that the achievements of a given network or industry (biotechnology medicines), as such, are not learning outcomes but indicators of firm-level performance and success, which are related to the (statistical) measures of learning. To give an idea of this mediation, indicators of performance are cited at some length:

(...) we underscore in the foregoing that the relationship between our measures of learning and the varied indicators of performance are merely suggestive. Nonetheless, we offer these signposts of organizational performance because they illustrate the critical stages in the process of developing biotechnology medicines. Highly visible publications attract scientific attention and serve as signals to investors and intellectual talent. Obtaining product approval for a new medicine and generating high-volume sales show that science-based companies can take ideas from the laboratory to successful commercialization. A market value in excess of \$500 million is evidence of staying power, a robust sign that firms organized around networks of learning are capable of producing enviable results (Powell et al., 1996, pp. 141, 142).

For Ariño and de la Torre (1998), learning is above all learning-about-the-partner in interaction over time. In the beginning, the execution of initial commitments allows each company to learn whether the partner’s contributions are as originally expected. During the collaboration, a number of “learning-action-reaction” loops follow in the critical points where a firm makes judgments of the efficiency and equity of the joint venture. For example, the third loop “... starts with Hexagon’s learning of NAMCO’s failure to live up to its commitment to give administrative credit to the regional offices (“B”) [path from execution to re-evaluation; HT], with a loss of both efficiency and equity for Hexagon” (ibid., p. 321).

The event analysis allows one to follow the evolution of products and activities (the “what”) of the joint venture with a precision not possible through other approaches at hand. However, the authors do not elaborate these findings in the model of collaborative venture evolution. The significance of joint production for the learning process remains unarticulated. I will come back to this problem in the conclusions below.



Larsson et al. (1998) define interorganizational learning as collective acquisition of knowledge among a set of organizations (ibid., p. 287). The creation of new knowledge, they propose, is a function of the total amount of knowledge that is disclosed and absorbed among the organizations (ibid., p. 290). The more mutually transferred knowledge, they conclude, the more opportunities to generate new knowledge through combining different pieces of existing knowledge.

Thus it is *knowledge*, in general, that is gained in networks. The learning outcome, either transfer of existing knowledge or creation of new knowledge, is a result of the interacting learning strategies adopted by the partners. However, a learning outcome also refers to the interplay between the strategies:

The asymmetric exploitation of a collaborative organization by a competing partner is the least stable interorganizational learning outcome. (...)

Perhaps the most stable joint learning outcome is symmetric compromise strategies (Larsson et al., 1998, p. 293).

This, in fact, exemplifies confusion stemming from the way *learning-through-network* and *learning-to-network* are implicitly combined, which is reflected in the conclusion: “Hence, the *collective knowledge development* in strategic alliances will benefit from the creation of effective safeguards of collaborative learning strategies that emphasize *long-term orientation, interorganizational trust, and collective awareness*” (ibid., p. 301; italics added).

The authors do not specify the types or contents of knowledge being learnt in strategic alliances. The processual learning model, they argue, gains explanatory power over the content considerations, which, even though important, would further complicate the framework (ibid., pp. 292, 302).

Holmqvist (1999) is the only one in this comparison to elaborate the idea of knowledge as a learning object: “To provide consistency [of imaginary organization, HT] and to enable new partners to participate in the value-making processes, the need for constantly creating and expanding joint, interorganizational, knowledge is of fundamental importance” (Holmqvist, 1999, p. 427). The outcomes of conversion of tacit knowledge are habitual ways of relating to each other, routine-knowledge shared by all actors, and overall mutual understanding among the partners. Explicit knowledge becomes stored in the imaginary organization’s artificial memory, such as jointly written standard operating procedures and explicit programming codes, preserved in programming libraries.

What is being learnt in the imaginary organization of the SPCS? This is an example of “Combination (II),” conversion from organizational explicit knowledge to interorganizational explicit knowledge:

Experts sought to become more skilled in understanding the technical programming language of each program. In interacting with the experts, programmers showed them how to write technical demand-specifications in order to facilitate the practical implementation. According to one of the expert companies, the programmers recurrently said that they wanted the specifications “simple and straightforward, without any need to make subjective interpretations”. By showing experts examples of programmers’ specifications stored in files and computers, and by letting the experts comment on them and combine them with their own explicit requirements, programmers and experts could jointly discuss how a solution could be constructed. This led to a joint basing of explicit interorganizational knowledge that was satisfactory to both partners. The negotiated result was in written form, typically in a demand-specification in which all partners had access to and, consequently, could benefit from (Holmqvist, 1999, p. 434).

*Summary: What do they learn in networks?*

It may be concluded that what firms gain in networks is, above all, knowledge. It is a kind of knowledge that cannot be obtained inside the boundaries of a single firm. The theoretical models of learning in networks address another main object of learning, that is, collaboration and collaborative practices. Thus, firms learn diverse things through networks and, moreover, all learning outcomes cannot even be anticipated.

All authors of the five texts, except Holmqvist, drop knowledge out of the models and concentrate on the *learning-to-network* issues. In other words, learning outcomes are seen as skills and strategies for building up partnerships. Dodgson takes up collaborative culture and trust, Powell et al. point to the capability to function in networks, Ariño and de la Torre focus on efficiency and equity in partnership, and Larsson et al. emphasize the interplay of learning strategies. *It seems that the nature and the contents of knowledge are not interesting from the point of view of learning.* Knowledge is given as a part of the context in the same manner as was pointed out in the *who*-question above.

Of all four learning questions, the *what* is the most poorly grounded. Not only the concept of knowledge remains abstract but also, in a broader sense,

learning remains empty in its contents. Holmqvist (1999) shows that collaborative creation of knowledge is firmly embedded in the practices of organizational as well as production activities. The contents of learning can be articulated in terms of solutions created for diverse sets of problems, organizational as well as production-related, occurring in the course of interorganizational collaboration. The example of Combination (II), cited above, resembles the idea of *boundary objects* presented in the next subsection 2.4. Unfortunately, these aspects are not visible in the model of knowledge conversions, which concentrates primarily on the *how*-question.

#### 4) How do they learn in networks?

The studies reviewed present basically three types of models of learning processes: evolutionary path-dependent models by Dodgson (1993), Powell et al. (1996) and Ariño and de la Torre (1998); the game-theoretic type of model by Larsson et al. (1998); and a model of knowledge creation by Holmqvist (1999). I will examine how each of these models spells out the learning process taking place in interorganizational collaboration.

Dodgson (1993), who does not put forth a visual model, describes the learning process between the partners as evolving gradually over a lengthy period of time. At the start, relations were mixed, and problems were believed to be inevitable. This was due to the different ethos and aims of the organizations, one commercial the other scientific. It is mentioned that there was initial disquiet within the Medical Research Center concerning the way its partner was addressing technologies different from the ones the MRC itself proffered. Dodgson sees the collaboration process as a gradual convergence of the expectations of the partners. Learning is here associated with the creation of practices “in an area where no previous role models existed (the MRC had no previous experience of such an arrangement)” (ibid., p. 87). Dodgson emphasizes that generating good working arrangements between individual researchers required an understanding of the pressures facing others, which took time.

Powell et al. (1996) design the cycles of learning model as an outcome of their statistical analysis (Figure 2.1). Firms can enter the cycle through any type of tie, even though R&D ties are seen as most important in the biotechnology networks. The initial ties enable firms to access more diverse sources of collaboration and provide experience in managing networks. Management experience, in turn, enables a firm to become more central, the effects of which are described through the dynamics of the cycle:

First, regardless of the pathway, centrally located DBFs are connected into the main component of the industry, providing access to critical information and resource flows needed for internal growth. The second effect is a feedback process in which centrality leads to the initiation and continuance of R&D alliances, thus sustaining the dynamics of learning. R&D ties and other types of collaborations are the admission ticket, while diversity, experience, and centrality are the main drivers of a dynamic system in which disparate firms join together in efforts to keep pace in high-speed learning races (Powell et al., p. 138; DBF = dedicated biotechnology firm).

Ariño and de la Torre (1998) develop their model by interpreting collaborative behavior that emerges from the data (Figure 2.2). In their view, the process starts with negotiation and commitment, setting an alliance's initial conditions. After this, the execution of those commitments begins, as well as the associated learning processes (ibid., p. 319).

A number of "learning-action-reaction" loops are set in motion through the partners' evaluations of the relationship and its efficiency and equity conditions. In a benign case, a change in external conditions leads a firm to evaluate "that the value it derives from the venture has increased or that any temporary imbalance thus created is within tolerable limits" (ibid., p. 319). In an opposite case, the alliance is assessed as having a lower value and possibly violating the equity condition, and "then some corrective action is required to restore efficiency and/or equity" (ibid., p. 319).

Positive loops will reinforce relational quality, incorporating learning from the past interactions and increasing inter-partner trust. If a renegotiation stage fails and/or there are no established procedures for conflict resolution, the aggrieved party may react unilaterally in order to restore its lost efficiency or equity. This, in turn, affects another firm's re-evaluation of its interests following the partner's unilateral reaction, which is likely to result in a deterioration of the relationship quality. The alliance will be dissolved when either its value to the partner falls below that of some alternative arrangement accomplishing the same purpose, or if there is a serious violation of the equity condition (ibid., p. 320). After proposing the model, they turn to the data organized in fourteen major events. For example, the set of interactions in the first three events (plus an action mentioned in event 9):

... follows loop "B-D-B-H". The actions taken by each party had the effect of increasing the value of the alliance to both companies ("B"). Even when some costs were implied, the increased value made the alliance more efficient, and any temporary imbalance in equity was within reasonable limits

(“D”). As a result of the execution of these new arrangements (“B”), relationship quality was enhanced (“H”) (Ariño & de la Torre, 1998, p. 321).

After a promising start of the joint venture, it is reported that problems occurred and “a cumulative set of circumstances contribute[d] to a rapid deterioration of the quality of the relationship in spite of enormous market success and potential” (ibid., 321). In the events, it is described how the appearance of competitors and alternative partners to the venture affected the relationship. In the model these are defined as “external changes” or “external events” (path “C”), which, nonetheless, have a critical impact on relational quality (ibid., p. 321).

According to Larsson’s et al. (1998) game-theoretic framework, organizations learn by adopting certain learning strategies in interaction with their partners (Figure 2.3). These strategies are compositions of four dimensions: receptivity and transparency dimensions of interpartner learning (Hamel, 1991), and integrative and distributive dimensions of a conflict behavior model (Walton & McKersie, 1965; Thomas, 1976; 1979).

The researchers claim that their framework allows a process view of interorganizational learning, by specifying the “processual boundary conditions,” which means that “(...) we can gain explanatory ability by specifying certain previous combinations of learning strategies in  $t_1$  as the processual boundary conditions for each of our proposed learning interaction outcomes in  $t_2$ ” (Larsson et al., 1998, p. 292). In other words, the combinations of learning strategies adopted by the partners at a certain point of time predict the subsequent learning interaction. This “shadow of the past,” the authors argue, is more powerful in explaining learning outcomes than content considerations, such as whether the alliance is horizontal or vertical, equity or nonequity, R&D or market-oriented.

The proposed learning dynamics are systematized into a set of propositions, of which the first five deal with the barriers to interorganizational learning, and the remaining four with more constructive empowering factors. In empowering situations, several facilitating factors come into play, such as *learning stakes* and *prior interaction in related areas*. The former refers to the interests and motivation of a single organization to contribute to collaboration with partners, whereas the latter refers to the previous outcomes of collaboration.

**PROPOSITION 6.** If one organization adopts Accommodation in  $t_1$  and the other organization adopts:

- (a) Collaboration, then the higher the learning stakes and the greater the prior related interaction, the more likely the Accommodating organization will also adopt Collaboration in  $t_2$ ;
- (b) Compromise or Accommodation, then the higher the learning

stakes and the greater the prior related interaction, the more likely the Accommodating organization(s) will also adopt Compromise in  $t_2$  (Larsson et al., 1998, p. 295).

In Holmqvist's (1999) model (Figure 2.4), learning takes place through eight knowledge-creating processes in imaginary organizations (Table 2.3). As already explained, Holmqvist then provides eight examples of the knowledge conversions, one of each type, through partner interaction in the imaginary organization of SPCS.

**Table 2.3** Knowledge-creating processes in imaginary organizations (Holmqvist, 1999)

1. <i>Socialization (I)</i> : from individual tacit knowledge to interorganizational tacit knowledge
2. <i>Articulation (I)</i> : from individual tacit knowledge to interorganizational explicit knowledge
3. <i>Combination (I)</i> : from individual explicit knowledge to interorganizational explicit knowledge
4. <i>Internalization (I)</i> : from individual explicit knowledge to interorganizational tacit knowledge
5. <i>Socialization (II)</i> : from organizational tacit knowledge to interorganizational tacit knowledge
6. <i>Articulation (II)</i> : from organizational tacit knowledge to interorganizational explicit knowledge
7. <i>Combination (II)</i> : from organizational explicit knowledge to interorganizational explicit knowledge
8. <i>Internalization (II)</i> : from organizational explicit knowledge to interorganizational tacit knowledge

In the final discussion, Holmqvist reflects upon how these processes become possible. Imaginary organizations have a potential capability of creating a field where partners' tacitly held organizational knowledge may be "brought to the surface." This happens through reflective conversation that enables partners to detect and articulate tacitly-held knowledge into explicit knowledge, thereby building joint, interorganizational knowledge. "By reflecting on habitual behavior, individuals can become aware of underlying knowledge that guides behavior," Holmqvist (1999, p. 435) concludes.

*Summary: How do they learn in networks?*

Network studies provide lively descriptions of how firms and alliances gradually overcome the initial suspicions and differences and construct collaborative cultures across the boundaries. We know that successful collaboration presupposes long-term orientation and mutual commitment to joint efforts. This, in turn, enhances interorganizational trust that can be seen both as a precondition

for and an outcome of collaboration. In addition to these descriptive results, the models are designed for conceptualizing how learning in networks takes place.

The analyses show that network processes advance through rich interaction across boundaries at different levels of organizations. None of the models aims at providing a single answer to the question of how participants learn. Each proposes a variety of learning strategies and pathways through which firms can access collaboration. It is also pointed out that the ways partners learn to deal with conflicts are essential for the continuation of collaboration.

Frameworks of evolutionary pathways (Powell et al., 1998; Ariño & de la Torre, 1998) appeal to the overall image of networks evolving gradually over time. However, there is a risk of drawing a parallel between networks of human activity and living organisms in general, in which case much of the specifically human and cultural learning dynamics is missed. Emphasis is placed on the interplay and concurrence of the initial conditions (the inherited) and external impulses (the environment), whereas learning actions performed by means of cultural tools and resources are easily overlooked.

Holmqvist's (1999) approach catches the level of learning actions and interactions better than other analyses do. On the other hand, the adopted model of knowledge creation and learning does not deal with the tensions inevitable in a multi-voiced collaboration. Nonaka and Takeuchi (1995) have put forth a cycle model based on the four modes of knowledge conversion (Table 2.3) in an intraorganizational context. Holmqvist does not comment on that model. Engeström (1999) who does comment on it doubts that there would be any inherent cyclical order between the knowledge conversion modes. "Rather, they seem to be used in accordance with situationally constructed needs and opportunities, often in a probing manner and in opportunistic combinations" (ibid., p. 379).

## **2.4 Activity-theoretical contributions to the learning questions**

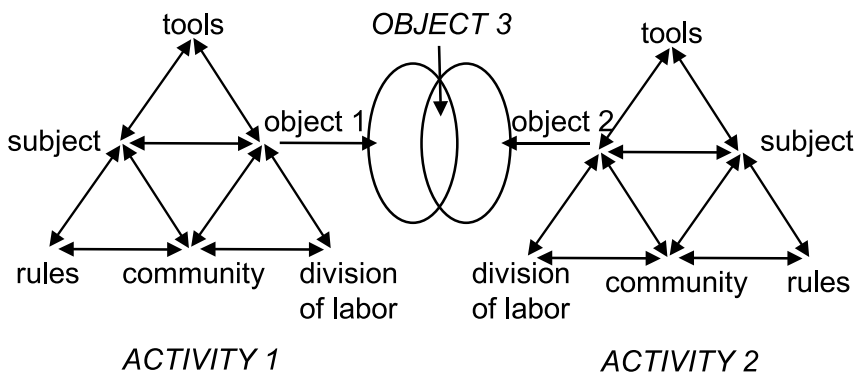
The preceding theoretical analysis was carried out by means of four basic learning questions: *Who* are the learners, *why*, *what* and *how* are they supposed to learn? Here these questions are further elaborated from an activity-theoretical perspective.

### **1) Who are the learners in networks?**

As discussed in section 2.3, the question of a learning subject has recently been revolving more and more around the levels of learning, along with the introduc-

tion of a new interorganizational level. The models thus far provide only a partial understanding of inter-level transitions and the role of a human actor at higher non-individual levels. According to a generally held view in organization studies, learning becomes interorganizational when collaboratively created knowledge is “engrained” in joint routines, values, and repositories. Dodgson (1993) saw this necessary for an alliance to survive people’s communication breakdowns and labor turnover. Holmqvist (1999) emphasized the need to bring partners’ tacitly held knowledge “to the surface” and to articulate it into explicit knowledge. This pattern of thought is based on a concept of knowledge (often equivalent to information), according to which knowledge can be stored in (and between) organizations to exist independently of individual actors.

I suggest that *learning at any level of collaboration is a fragile process, vitally dependent on local learning actions through which the outcomes of collaboration are, not only created, but also sustained and reproduced.* The meaning of local actions can be clarified by means of another level-related conception, namely the activity-theoretical distinction between collective *activity*, individual *actions* and routinized *operations*, put forth by Leont’ev (1978). In that framework, routines and knowledge repositories would belong to operations representing the lowest level of learning. The motives driving people to carry out operations cannot be grasped without making reference to the actions and the collective activity which operations are meant to sustain and reproduce. There are constant transitions between activity, actions and operations, as Leont’ev pointed out. As actions are routinized, they become operations, and, as new forms of activity break through, operations are exposed to reflection, and turned into actions constructing the emerging activity.



**Figure 2.5** The unit of analysis in studies of collaboration and learning (Engström, 2001a, p. 132)



Studying contemporary networks and emerging collaboration, it is not always possible to identify existing activity systems. Activity is under construction, and whether it will develop into a durable system is a matter of longitudinal follow-up and interpretation. The creation of the new in a network context is an outcome of multi-organizational collaboration. It has been suggested that the minimum unit of analysis of activity and learning would consist of two activity systems orienting towards a (partially) shared object (Engeström, 2001a; Figure 2.5)<sup>7</sup>.

In sum, only when specific learning actions and operations are situated in the (emerging) activity systems can we gain an understanding of the broader context or level. This means that the identification of levels themselves becomes a research task; levels are not predetermined or given. Neither are they causal in nature (Tobach, 1999), but interrelated in a tension-laden way, as zones for learning and boundary-crossing. *In this study, the levels will be constructed both bottom-up, from the local and situated actions of the collaborating partners, and top-down, from the historically emerging activity systems and networks.*

## 2) Why do they learn in networks?

Two main problems were identified concerning the motives of learning, as they have been analyzed in network studies. The first one was the separation of the historical and societal motives of *networking* from the motives of *learning*, which resulted in learning without objects. The second one was the way of treating collaborative conflicts as barriers of learning instead of contributors to the dynamics of learning.

*In this research, I wish to link closely the motives for learning with the motives and interests for collaborative production and business activity.* People are learning because they face challenges and solve problems vital to their activity. If firms alone are forced to question their prevailing ways of dealing with issues, they bring these dilemmas to the collaborative relationships as well.

Dodgson (1993), for instance, interpreted the aberrations from the organizationally-accepted alliance between science and commerce as subjective expressions by “opinionated individuals.” The case could be reinterpreted to show that the struggle between science and commerce was actually not solved once and for all at the interorganizational level. It may have represented a real contradiction for the participants, therefore popping up every now and then through

<sup>7</sup> This is a model for the *third generation of activity theory*. Engeström (2001a, pp. 130-133) argues that the first generation of activity theory, centered around Vygotsky, created the idea of *mediation*. The second generation, centered around Leont’ev, introduced a model of a *collective activity system*. The third generation, along with the internationalization of the activity theory, addresses the *diversity* and dialogue, multiple perspectives and *networks* of interacting activity systems.

individual actions in collaborative situations. Tension-laden motives and diverging interests should not be seen as problems, but as energizers of the entire networking. To tackle these questions, I will introduce the activity-theoretical concepts of *the zone of proximal development (ZPD)* and *contradictions*.

Vygotsky (1978) defined the zone of proximal development as “(...) the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (ibid., p. 86). The zone referred to the potential for development in a child’s maturation process: “(...) functions that will mature tomorrow but are currently in an embryonic state” (ibid., p. 86).

Vygotsky was among the first to show, through empirical studies, that development and learning are social in nature, happening in and through collaboration as well as by means of signs and tools. The concept of the ZPD has become one of the cornerstones of activity theory, extended from child development and peer interaction to collaborative activities of adults (Rogoff & Wertsch, 1984; Moll, 1990). Engeström (1987, p. 174) pointed out that the notion of the ZPD is valid, not only regarding individual development, but also with regard to new historical forms of societal activity that can be collectively generated as a solution to contradictions manifesting in everyday actions<sup>8</sup>.

In this research, networking among subcontracting firms is supposed to represent such a historically new form of societal activity (see Chapter 3). By searching for and creating new kinds of collaboration, the participants - more or less consciously - were trying to solve present problems and, at the same time, orient themselves to the future demands of business activity in ever-changing networks. Seeing learning processes in this way, the exploration of the ZPD is a key to understanding *why* learning takes place in networks, be it learning about the object of collaboration or learning about collaborative practices as such. It is also important to notice that the ZPD points at the *potential* future development; it is a *historical hypothesis* worked out by participants through interaction<sup>9</sup>.

The emergence of network activities is to be understood in terms of historical challenges faced by people and firms in the zone of proximal development. *Contradictions*, in this framework, are theoretical constructions that explain dis-

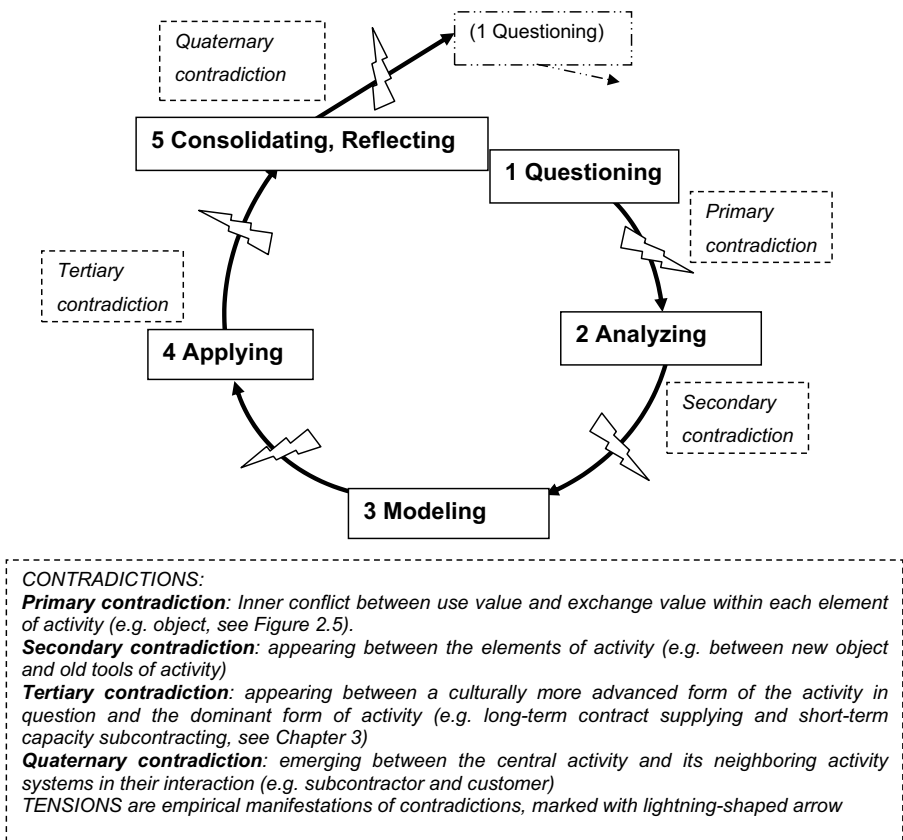
<sup>8</sup> Griffin and Cole (1984) have emphasized the importance of a child’s creativity in setting developmental goals in contrast to the teleological, adult-centered interpretations of the ZPD (Zo-ped) and other related concepts, such as next-step models and scaffolding. Engeström (1987, pp. 169-175) pointed out that Vygotsky himself said little about the creative processes in this context, and that the cultural-historical school founded by Vygotsky has concentrated on the acquisition, assimilation, and internalization - rather than the creation - of the tools and sign systems of the culture.

<sup>9</sup> In this study, the historical hypothesis of the zone of proximal development will be worked out in two phases. First, Chapter 3 puts forth a general historical hypothesis concerning the development of interfirm collaboration; secondly, in Chapter 5, the historical hypothesis is specified to address the learning challenge of the Club network.

turbances and tensions in terms of the historical development of activity systems. *Disturbances* and *tensions* are manifestations of these contradictions to be explored empirically within and across the levels of collaboration.

The specific motives for learning in networks are revealed by analyzing how participants work out contradictions. Motives emerge when contradictions are articulated and possible directions for their resolution are identified through search actions and imagination.

However, the concepts of the zone of proximal development and contradictions need, once again, some reformulation in order to be applied in complex network studies. To start with, I will present the model of expansive learning as the framework for ZPD and contradictions (Engeström, 1987; Figure 2.6). The elaboration of the model will take place in Chapter 5 when applying it to the development of the *Club* network.



**Figure 2.6** The cycle of expansive learning (Engeström, 1987; 1999): epistemic actions 1 - 5, contradictions and tensions

To my knowledge, theorizing on the ZPD in a network context is scarce. Typically, in networks we do not deal with *the activity*, but with multiple activities going on simultaneously, sometimes contributing to the development of the network under study, and sometimes pulling in different directions.

“The expansive cycle begins with individual subjects questioning the accepted practice, and it gradually expands into a collective movement or institution” (Engeström, 1999, p. 383). In this study, the birth of the *Club* well exemplifies this process. It was the materialization of a collective movement originating from some visionaries’ questioning the present way of running subcontracting business. The cycle (Figure 2.6) proposes a sequential model for development of any activity system that expands its object and, thereby, transforms the entire activity. Change is suggested to proceed through epistemic actions put forth in the figure as follows: *Questioning* the present activity, *analyzing* the situation and the need for change, *modeling* the new activity, *applying* the new, and *consolidating and reflecting* the new (Engeström, 1987)<sup>10</sup>. The epistemic actions represent developmental steps or phases of the cycle, articulating the zone of proximal development in the process of change.

The sequence of epistemic actions is also a sequence of contradictions providing an insight into *why* people become motivated to learn. (The cycle will also be discussed in the section addressing the *how* question.) Contradictions should not be confused with problems participants solve and do away with. The resolution of one contradiction leads to another, to be dealt with in a new developmental phase. In the depiction of the cycle, I have added the emergent tensions that manifest the underlying contradictions. Tensions are empirically observable dilemmas network members encounter in the course of collaboration. I will focus on tensions in much of my analysis.

### 3) What do they learn in networks?

A central problem in the studies reviewed seems to be that *the contents of learning are separated from the contents of production collaboration*. This is related to the dilemma of motives. Just like the original reasons for entering into collaboration are substituted by abstract generalizations, the concrete objects of collaboration are replaced by general learning dynamics and outcomes of various types. *I want to point out that the object of learning and the object of collaboration are inseparable*. Actors and activity systems do not “learn” knowledge in an ab-

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<sup>10</sup> Y. Engeström (1999) names seven epistemic actions: questioning, analysis, modeling, implementing, reflecting, and consolidating. A five-step cycle accords with an earlier presentation of the model (Engeström, 1987).

stract sense; they learn about specific products, technologies and collaborative practices.

The notion of the object of activity is most central in activity theory. Its significance has increased along with network analyses. The minimal unit of analysis of activity was defined above in terms of two activity systems partially sharing the same object (Figure 2.5). The object becomes the most decisive element in defining an activity system and its network relationships with other actors in the same field (Miettinen, 1998; Hasu, 2000a, 2000b; Saari & Miettinen, 2001; Foot, 2002). The object orientation is nicely captured by Foot (2002).

For an activity theory researcher, striving to understand an evolving object in all its complexity requires careful study of an activity system over time, from several perspectives and ideally through several kinds of data. Although object conceptions can be observed and identified empirically, the object—engaged and enacted yet always unfinished, simultaneously material and ideal—is in its essence “uncatchable.” Perhaps the most illuminating questions a researcher in pursuit of object understanding can ask are toward what is the collective activity oriented, and what is energizing it? The “catches” in the form of manifested object-concepts, though partial and transitory, are worth the pursuit. (Foot, 2002, p. 148)

*The idea of following objects in order to grasp the process of learning is by and large unfamiliar to studies of learning. Also, the methodological potential of including material artifacts in the analysis of learning interaction is underutilized<sup>11</sup>. In my research case, the object was ideal and obscure, still in the making at the time of my fieldwork. As a researcher, I followed the object partly “on-line,” trying to sort it out from many candidate objects emerging in the intermingling collaborative actions.*

An interesting conceptualization of a shared object of activity in a network context is that of a “boundary object” (Star, 1989; Star & Griesemer, 1989; Bowker & Star, 1999). It was created as a means of analyzing heterogeneous problem solving carried out by divergent communities and viewpoints. The term “object” is somewhat misleading, as boundary objects serve above all as tools for constructing a common object (Miettinen, 1998) and as mediating artifacts in the interaction and communication among multiple activity systems.

Boundary objects are objects that are both plastic enough to adapt to local needs and constraints of the several parties employing them, yet

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<sup>11</sup> The “cultural approaches” of practice-based theorizing on situated learning and knowledge in organizations (Gherardi, 2000; Wenger, 2000; Yanow, 2000) focus mainly on mediating artefacts, such as tools and language, not so much on material objects of collaboration.

robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual-site use (Star 1989, p. 46).

(...) we define boundary objects as those objects that both inhabit several communities of practice *and* satisfy the informational requirements of each of them. In working practice, they are objects that are able both to travel across borders and maintain some sort of constant identity. They can be tailored to meet the needs of any one community (they are plastic in this sense, or customizable). At the same time, they have common identities across settings. This is achieved by allowing the objects to be weakly structured in common use, imposing stronger structures in the individual-site tailored use (Bowker & Star, 1999, p. 16, see also p. 297).

Not accidentally, the concept was developed by focusing on scientists' work, although meant to be more generally applicable as well. As Bowker and Star (1999, p. 296) point out: "(...) scientists routinely cooperate across many communities of practice. They thus bring different naturalized<sup>12</sup> categories with them into these partnerships."

Boundary objects are expected to arise when two or more differently naturalized classification systems collide. "Thus nursing administrators create classification systems that serve hospital administrators and nursing scientists; soil scientists create classifications of soil to satisfy geologists and botanists (...)" (Bowker & Star, 1999, p. 297). An initial example by Star and Griesemer (1989) was the specimens of dead birds in a museum, having very different meanings to amateur bird watchers and professional biologists, used by each group.

The notion of a boundary object opens up moral and ethical issues. Boundary objects are established to manage divergent and conflicting classification systems of cooperating communities of practice, in other words:

[to] resolve anomalies of naturalization without imposing a naturalization of categories from one community or from an outside source of standardization. (They are therefore most useful in analyzing cooperative and relatively equal situations; issues of imperialist imposition of standards, force, and deception have a somewhat different structure.) (Bowker & Star, 1999, p. 297)

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<sup>12</sup> Naturalization describes the trajectory of an object in a community. It is a process through which objects that mediate action become transparent, given, and durable. "A naturalized object has lost its anthropological strangeness" (Bowker & Star, 1999, 299).

According to Bowker and Star (1999, p. 297), boundary objects arise over time from durable cooperation among communities of practice. From the point of view of learning and learning research, boundary objects are perhaps more interesting as outcomes than as preconditions of learning and collaboration. Thinking of novel networking activities and their lack of boundary objects, it can be expected that problems occur and learning is limited or prohibited.

*From an activity-theoretical point of view, a key question is: In what ways can the common object (the object of production and co-construction) serve as a boundary object bringing together multiple perspectives of different communities of practice?* Bowker and Star (1999) ask whether a standard, naturalized in more than one world and being imposed on them, can ever be a boundary object. The same can be asked about the objects of collaborative design and production, which are imposed, for instance, by customers' requirements, but to some extent are weakly structured and negotiable. Furthermore, despite the rise of interfirm networks, the idea of equal communities stands in a contradictory relation with the hierarchical idea of a value chain, through which the object is constructed. After all, one may ask, are boundary objects still more characteristic for scientific communities and "intellectual" work than for production work and industry<sup>13</sup>?

#### 4) How do they learn in networks?

*We have to go into the learning actions of the participants in order to understand the dynamics of learning and collaboration in networks. Learning is a contradictory process embedded in the joint problem solving and creation of collaborative practices, as well as in the construction of the objects and products that are sought for through partnerships.*

So far the application of the cycle of expansive learning on network settings has been scarce. Foot (2001) studied The Network for Ethnological Monitoring and Early Warning (EAWARN), established to monitor ethnic relations and provide "early warning" of conflicts in the former Soviet Union<sup>14</sup>. She interpreted the Network's evolution from 1990 to 1996 through two expansive cycles combined in a specific way:

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<sup>13</sup> Araujo, Dubois and Gadde (1999) touch on this problem (not from the object-oriented but from the resource-based perspective) by discerning four types of supply interfaces (standardized, specified, translation, and interactive), of which the interactive one includes the possibility for joint development and learning. "Designing interfaces is never a one-sided affair, no matter how powerful the local customer or supplier is," they summarize (ibid., p. 506).

<sup>14</sup> The level of the analysis on which the EAWARN was studied resembles my research case, the *Club*. Also the timing of initiation of both networks (beginning of the 1990s), as well as the start of research through participant observation (fall 1995), coincide. Foot's (2001) article provides a good and concise presentation of activity-theoretical methodology and its empirical application.

Viewing the two cycles next to each other reveals that, chronologically, there is a partial overlap between them. As spiraling cycles, the second is contingent upon the first, though not strictly successive to it. The introduction of the indicator model [an event in the Network's history; HT] occurred in the evaluation phase of the first cycle and in the analyzing phase of the second cycle. In other words, the introduction of the indicator model was an action with dual meaning. On one hand, it was an action of evaluation and consolidation. On the other hand, it was an action that led to the modeling of a new form of activity (Foot 2001, p. 74).

The analysis revealed not only overlapping cycles but also the creation of a multifaceted object of the Network's activity, manifesting the primary contradiction between the sociopolitical and economic concerns (use value vs. exchange value). Two main object-conceptions (with a total of seven different manifestations) were identified: the monitoring of ethnic relations for the purpose of providing early warning of conflict, and the building of epistemic communities.

Foot (2002) points out that there was some chronological sequencing within and between the formation of the object-concepts. For instance, the object-concept of epistemic community building through the Network was a later layer than the ethnological monitoring/early warning object-concept. However, the chronological sequencing and the formation of a multi-layer object are not readable from the expansive cycles, formed through a separate analysis (Foot, 2001). It is not easy to figure out whether each of the object-conceptions remained alive concurrently and in a competitive relation with others, or whether there was one object prevailing at a time. Probably both options were realized to some extent. The latter is supported by the notion that participants of the Network seemed to agree upon a central aim for their collective activity, and that "they articulated surprisingly consistent conceptions of what that aim/object was" (Foot, 2002, p. 148). *The consistency of the object may have contributed to the shaping of whole expansive cycles. In the case of the Club, that consistency is problematic, which prompts me to anticipate discontinuities and breakdowns of the expansive learning process.*

Foot's network analysis provides an inspiring source for applying the cycle model of expansive learning to a multi-organizational setting. In exploring the cycles, she draws extensively on the participants' debate focused on a vital object of the Network. *My aim is to elaborate the approach by making the emergence of the contradictory object and the co-presence of competing objects more visible. They are basic aspects in the construction of the phases (the epistemic actions) of the expansive learning cycle.*



## 2.5 Conclusion

The problem of learning in networks was discussed by examining five articles contemporary with my research project. The examination was based on four questions: *Who* are the learners in networks, *why*, *what* and *how* do they learn in and through networks. The analysis elicited a rich variety of learning-related notions and pointed to themes to be developed further. Taking up these findings, I then turned to the activity-theoretical conceptions of collaboration and learning. To close the chapter, the main activity-theoretical theses are summarized.

### *Who?*

I suggest that learning at any level of collaboration is a fragile process, vitally dependent on local learning actions through which the outcomes of collaboration are not only created but also sustained and reproduced. Only when specific learning actions and operations are situated in the (emerging) activity systems can we gain understanding of the broader context or level. This means that the identification of levels themselves becomes a research task; levels are not pre-determined or given. In this study, the levels will be constructed both bottom-up, from the local and situated actions of the collaborating partners, and top-down, from the historically emerging activity systems and networks.

### *Why?*

In this research, I wish to link closely the motives for learning with the motives and interests for collaborative production and business activity. Tension-laden motives and diverging interests should not be seen as problems, but as energizers of the entire networking. To tackle these questions, I will introduce the activity-theoretical concepts of *the zone of proximal development (ZPD)* and *contradictions*. ZPD points to the *potential* future development; it is a *historical hypothesis* worked out by participants through interaction. Motives emerge when contradictions are articulated, and possible directions for their resolution are identified through search actions and imagination.

The cycle of expansive learning proposes a sequential model for development of any activity system that expands its object and, thereby, transforms the entire activity. The model puts forth a sequence of contradictions providing an insight into why people become motivated to learn. Tensions are manifestations

of the underlying contradictions, being empirically observable as dilemmas network members encounter in the course of collaboration.

### *What?*

I want to point out that the object of learning and the object of collaboration are inseparable. Actors and activity systems do not gain knowledge in an abstract sense; they learn about specific products, technologies and collaborative practices.

The idea of following objects in order to grasp the process of learning is by and large unfamiliar to research on learning. In general, the methodological potential of including material artifacts in the analysis of learning interaction is underutilized.

The notion of a boundary object opens up moral and ethical issues. Boundary objects are established to manage divergent and conflicting classification systems of cooperating communities of practice. From an activity-theoretical point of view, a key question is: In what ways can the common object (the object of production and co-construction) serve as a boundary object bringing together multiple perspectives of different communities of practice?

### *How?*

We have to go into the learning *actions* of the participants in order to understand the dynamics of learning and collaboration in networks. Learning is a contradictory process embedded in the problem solving and creation of collaborative practices, as well as in the construction of the objects and products that are sought for through partnerships.

In previous studies, the consistency of the object may have contributed to the shaping of whole expansive cycles. In the case of the Club, that consistency is problematic, which prompts me to anticipate discontinuities and breakdowns of the expansive learning process. My aim is to elaborate the expansive learning approach by making the emergence of the contradictory object and the co-presence of competing objects more visible. They are crucial aspects in the construction of the phases (the epistemic actions) of the expansive learning cycle.



## **3 From survival to product development: Outlines of the history of collaboration among the Finnish metal-working subcontracting companies**

### **3.1 Introduction**

“There’s nothing new with networks,” was the claim I heard people in firms stating every now and then during my study. I interpreted it as a critical standpoint against the use of new fashionable terms that suggest that firms had not pursued any collaboration before the 1990s. On the other hand, it was obvious that firms were facing new challenges of networking in economic and social life, and nobody seemed to question that. Globally, these developments are associated with the new modes of information technology and knowledge generation, articulated by Manuel Castells (1996) as “The Rise of the Network Society” of the Information Age. Castells acknowledges the cultural and institutional diversity of informational societies:

Thus, all societies are affected by capitalism and informationalism, and many societies (certainly all major societies) are already informational, although of different kinds, in different settings, and with specific cultural/institutional expressions. A theory of the informational society, as distinct from a global/informational economy, will always have to be attentive to historical/cultural specificity as much as to structural similarities related to a largely shared techno-economic paradigm (Castells, 1996, pp. 21, 22).

However, even Castells’ analysis has been criticized for falling short of empirical analysis of actual societies and processes (Heiskala, 2001). For example, the “network enterprise” may refer to equal cooperation between partners as well as to hierarchical chains of subcontractors of a multinational corporation. I will

follow the guideline on historical and cultural specificity and approach the network issue at a local level.

In this historical overview, I will discuss interfirm collaboration among Finnish metal-working subcontracting companies, during the post-war period up to the 1990s. The question is: *What were the learning challenges<sup>15</sup> of interfirm collaboration, and how did the learning challenge of the 1990s differ from the preceding ones, what was specific and new about it?* Today, collaboration is embedded in the *production activity* of firms, but this has not necessarily been the case earlier in history. The following analysis is therefore aimed at exploring the *leading collaborative activity* of each time period, giving rise to the learning challenges<sup>16</sup>.

Reviewing the post-war era is reasonable because this era brought about the internationalization of Finnish metal-working, as well as other industries. Internationalization, accompanied and facilitated by advanced information technology, anticipates, with certain reservations, the emergence of global networks (Castells, 1996, 97-99). Before the war, at the end of the 1930s, the metal-working industry functioned mainly in the domestic market; its share of the total exports was four percent. At the beginning of the 1960s, the metal-working industry had become the biggest industrial sector of Finland, surpassing the forest and wood processing industry. In 1995, it accounted for nearly 40 % of the Finnish export of goods, which had grown to 46 % in 1998<sup>17</sup>.

From the viewpoint of a subcontracting company, collaborative relations may be *vertical*, ranging downstream to the main suppliers and customers, and upstream to the next-tier subcontractors and suppliers (Reve, 1990). Another type of relation is a *horizontal* tie between subcontractors at the same level, representing either the same or a different value chain and, accordingly, being differently located on a competition - non-competition axis. Still another range of relations are the contacts outside the supply and value chain, for instance the developers, research units, schools, and societal actors (officials, political actors) of various kinds. Thus, the network of a firm may be understood as an ever-changing combination of these relations.

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<sup>15</sup> Learning challenges manifest themselves in problems, tensions and dilemmas encountered by subcontracting firms at different times (see, for example, Virkkunen & Kuutti, 2000). The concept of learning is elaborated in Chapter 2.

<sup>16</sup> Leading activity was defined by Leont'ev (1981) as the form of activity being psychologically dominant during a given period of an individual's developmental history (play, school, work etc.). In this case, this concept is applied to collective development to define the dominant form (and motive) of collaborative activity at each historical period. Concurrent activities are partially subsumed by the object and motive of the leading activity.

<sup>17</sup> *Foreign Trade 1995*, Volume 3, published by the National Board of Customs; *Year Book 1999, Metals, Engineering and Electronics Industry*, published by FIMET. The statistics include mechanical engineering together with electronics and electrotechnics industry. The numbers from 1995 and 1998 may not be perfectly comparable, as the compilation of statistics on the metal industry has changed since 1995.

*I will focus on horizontal collaboration among subcontracting metal-working companies.* Even if the subcontractor – main-supplier relationship is left in the background, a brief summary is needed in order to understand the context of collaboration (Table 3.2). The development of the metal-working subcontracting companies is tied up with the history of the small and medium-sized metal-working industries. Therefore, part of the historical review will deal with the latter, keeping in mind that it covers a broader domain than the former.

### **3.2 Historical challenges of interfirm collaboration**

The development of metal-working subcontracting in Finland has traditionally been bound up with the needs of the forest and wood processing industry. During the Second World War, priority was on the war industry. New subcontracting firms were born when production units detached from their mother companies, starting to serve a broader clientele during the wartime.

After the war, during the years 1945 – 1952, the metal-working industry was developed extensively because of the war indemnity of Finland to the Soviet Union. This necessitated producing ships, machines, factories, products of the paper and forest industry, as well as cables (Rasila et al., 1976). Thus, the State invested heavily in the metal-working industry. This period accelerated the structural change of the Finnish metal-working industry from light to heavy industries, and indirectly promoted Finland's international competitiveness (ibid.). On the other hand, the Finnish State, as the main customer for the firms, used a cost-plus method of setting prices, which neither provided an incentive for price competition nor encouraged interfirm cooperation. The State supported investments in new machinery and technology.

After the discharging of the war indemnity, the Soviet Union continued to be the main export country of Finland, until the 1960s when Western Europe became the biggest export market area. Finland became associated with the European Free Trade Association (EFTA) in 1961.

During the 1960s, when the demand was growing, subcontracting meant mainly capacity subcontracting, that is, using subcontractors to balance the overload situations of big companies' own production. Main suppliers preferred to take care of the entire production process in order to control the quality of products. This was a general trend in the mass production era. Finnish subcontracting firms were characterized as small garage workshops or mixed machine shops operating on the local market with the purpose of offering the main suppliers various kinds of manufacturing technologies. These firms lacked long-term planning and development, as they received mostly one-shot orders and rarely had business ideas of their own (Lehtinen, 1991).

The organized local level cooperation of the small metal-working firms started at the end of the 1950s, after the post-war deregulation and unionization of this sector. The association for small and medium-sized metal-working industries, founded in 1960 in the Tampere region, was the first district association under the reorganized Federation of Metal Industries. From its history, we learn that members of the association were mostly small subcontractors of less than ten employees. Cooperation was meant to promote the interests of the member firms as employers. The most important goal was to achieve cooperation in the market because, as it was reasoned, small and medium-sized metal-working firms found it difficult to compete relying solely on their own products, and cooperation was the only way to increase the price level to be profitable enough for firms (Myllykangas, 2000).

The activities of local unions ranged from professional lobbying and legal counseling to educational projects, as well as recreational events. New legislation for the labor market, as well as social welfare, was developed during the 1960s. Firms had to adapt to the new legislation and apply it in their activities. Early participants and founder members recall that cooperation among the entrepreneurs was informal and based on shared experiential knowledge, in contrast to the competition of today (Myllykangas, 2000).

Anticipating the object of this research, I will describe a collaborative experiment in the small and medium-sized metal-working industries. A company called *Mekes Oy* was founded in 1961, boarded by authoritative representatives of industry and politics at the State level (Myllykangas, 2000). Its purpose was to help the small and medium-sized metal-working industries in Finland in their domestic and foreign marketing efforts, and to search for items producible in these firms. These products were to be found by financing promising product ideas and by designing new products at the *Mekes* design unit. An impressive assembly hall was built in Parkano in the province of Häme, equipped with most modern, big machines that the member firms could not have afforded by themselves. The member firms as subcontractors would deliver the manufactured parts to be assembled here.

The production of *Mekes* was running full speed in 1963 – 1964, but soon it turned out that the products, mainly machines for agriculture, were no big sellers. One of the participants remembers: “At the end of 1964 it seemed as if the product development could not create marketable products. The organization of *Mekes* had become oversized. The headquarters in Helsinki employed, at its best, 150 persons, mostly product designers. All kinds of items were designed; little was put up for sale. The story of *Mekes* ended as stormily as it had started” (O. Niemi in Myllykangas, 2000, p. 65).

A more sustained development of the subcontracting systems dates back to the early 1970s. There were several reasons for this. The growing mass production required a division of labor between large-scale and small industries. The largest factories easily had thousands of small subcontractors. One of the most important factors was the growth of foreign trade in the metal-working industry, which made small firms less vulnerable to the fluctuation in domestic and foreign demand. This happened indirectly through the internalization of the clientele of big Finnish companies for which the subcontractors supplied parts.

Within the domain of the metal-working industry, the unification of two separate associations of small and medium-sized metal-working companies, in 1968, improved the position of this branch in relation to large-scale industry. Unification enhanced a more determined development of metal-working subcontracting activity. For example, the *Supplier Marketplace* that had been founded a few years earlier to promote subcontracting supply, started to function on a broader basis and became more efficient. It was based on the idea of gathering and publishing information about the products and services offered to buyers by the subcontracting firms (Lehmuskallio, 1977).

This historical phase brought about growing specialization of the firms. The introduction of the NC-technology offered small firms an opportunity to supply their main suppliers' serial production with standard quality requirements (Lehmuskallio, 1977; Lehtinen, 1991). Alongside the traditional local workshops, another group of subcontracting firms evolved: industrial firms with nationwide clientele, often in long-standing business relationships, utilizing advanced technology. Some of these firms were the former production units of big companies, having subsequently become independent subcontractors.

However, compared internationally, the Finnish subcontracting system was still seen as underdeveloped and underutilized as late as during the 1980s. Finnish companies seemed to prefer "make" policy instead of "buy," when organizing the supply of goods and services. Lehtinen (1991) summarizes the problematic issues of subcontracting companies, faced at the end of the 1980s: keeping delivery times, mastering large entities, and having relatively low profitability, caused by high capital and labor expenditures compared with the value added. At the same time, firms were increasingly facing the challenges of growing specialization and demands for flexibility, combined with the internationalization of business. These challenges were closely associated with the need for creating and maintaining collaborative networks (Hovi, 1995).

Contemporary changes of interfirm relationships have been reported in many Finnish and international studies on the cooperation of small and medium-sized enterprises (SMEs) (see Chapter 1). The bulk of the reports on subcontracting have focused on pure productive links, vertically, between the main



supplier (the customer) and the subcontractor. Under those circumstances, links have been considered even to be restrictive for the firm's operations, especially in the case of small firms. Companies located in the middle of a subcontracting network, being both performers and users of subcontracting, have proven to be "less flexible" workplaces than those totally outside subcontracting activity. For example, as late as at the end of the 1990s, Antila and Ylöstalo (1999) concluded:

Co-operation seems to be worthwhile whatever form it takes. In particular, broad, active interaction with various parties promoted operations and both permitted increases in staffing and boosted enterprises' operations generally. Involvement in subcontractor networks can be viewed as a highly positive feature, but in terms of operational success, the importance of such operations is very much less than that of broad co-operation (Antila & Ylöstalo, 1999, p. 22).

Broad cooperation was associated with new flexible modes, carried out through links with clients, consultants, educational institutions, the public sector and other companies, in contrast to the traditional modes of cooperation. Production activity through subcontracting did not seem to provide any further elements for broad cooperation and success:

When co-operation is based mainly on a production and business-related link alone, as is often the case in a subcontracting relationship, it may well also restrict operations. This is perceptible as a relative weakness of the limited co-operation model compared with the broad model (Antila & Ylöstalo, 1999, p. 22).

This could be interpreted to imply that, in order to gain success through networks, subcontracting firms were to create collaborative links *other* than those based on business activities. Another interpretation, which is particularly addressed in my study, would lead to the conclusion that firms had to expand the scope of the very production as well as their business-related links. In other words, small companies were facing the challenge of creating new objects of business activity through collaborative links and networks.

But what would it take for small subcontracting firms to start an expansion of this kind? In Finland, there is a strong tradition of emphasizing the independence and autonomy of entrepreneurs. Some research results indicate that the inclination towards independence prohibits cooperation, networking and growth of business activity (Vesala, 1996). This was also mentioned by the en-

trepreneurs and other practitioners during my start-up interviews. An executive level representative of the FIMET, having observed closely owner-managers of small metal-working firms, phrased it as follows (key points in *italics*):

*Interviewee:* I think it is wrong to think that all entrepreneurs would become good collaborators. It is basically an impossible idea, because an *entrepreneur wants to be independent*. No way that he or she would give it up. This will certainly be an exciting point of your research, an interesting point: *how to combine fire and water*.

*Researcher:* Oh yes, it is an issue on a different level than the competition and cooperation which belongs to the business activity...

*Interviewee:* ## Right, it is not like competition and cooperation, indeed, *even these are easier to combine than independence and cooperation*. (FIMET 2, 4/1996)

This senior official saw quite clearly the dilemma of entrepreneurs facing the demands of intensified cooperation and networking. I will now explore the ways they dealt with this dilemma when constructing new collaborative practices.

### **3.3 One story about the interfirm collaboration: The case of Firm A**

Before summing up the learning challenges of interfirm collaboration, I will let one of my research subjects introduce his perspective on the issue. Manager A was one of the key initiators of *the Club* and *the Alliance*, the networks analyzed in this study. At the start of the 1990s, he had been leading a company for ten years. The company, Firm A, was founded by his father in 1941 to subcontract spring products for the Finnish industry. This spring factory was born by detaching it from a large company, in order to manufacture springs, first for the armaments industry during the wartime and then for a wider clientele. Manager A described the situation at the turn of the 1980s when he overtook the leadership:

The collaboration with other spring manufacturers was marginal in our business. The turnover was nine million marks [1.5 million euros] and we had 75 employees. The market area covered only Finland. I had just started as a chief executive of the company, after having worked as a sales manager of the firm. Experience on interfirm collaboration was scarce, mainly trading of industrial products between the main supplier and the subcontractor. We designed springs for customers on a small scale, but did not determinedly pursue it as a core activity (Manager A, 1/1996).

In 1979, Firm A joined an export pool together with six other subcontracting companies. The Foreign Trade Association supported the group by hiring an export manager to serve the firms. The export manager contacted potential customers in Sweden and Norway and consulted the members of the pool in their exporting efforts. The group functioned three years.

In 1988 – 1990, Firm A and two other subcontracting firms organized joint marketing events around the country in order to nourish their customer relationships and introduce themselves to each other's customers. This group was formed by Firm A, Firm B, a metal-working subcontractor in the sheet-metal-working sector, and a tool producing firm that later merged with Firm A.

Both forms of marketing collaboration resulted in some productive and long-standing customer relationships. Manager A assessed that the export pool, however, was not as productive as expected:

It was partly because of the size of the group and difficulties in sharing responsibilities. Moreover, the firms lacked strategic capability to undertake serious exporting activity (Manager A, 1/1996).

The smaller cooperative group was more successful in terms of new customer contacts on Finnish soil. Its activity ended with the recession 1991 and with its inability to reform the concept of the marketing events.

The activity finally ended, partly because we weren't able to reform the program, partly because the recession began. There were fewer and fewer people entering the events. To go on with the activity, we should have based it more on the needs of the customers and hired a full-time person to develop these joint events (Manager A, 1/1996).

The international recession, at the beginning of the 1990s, shook up traditional subcontracting firms. According to Manager A, his firm actually turned inwards in its activity, and directed all its efforts to the survival of the company. There was no talk about the potentials of networking, as yet, at that time.

Interfirm collaboration was in recession as well. All the energy of the management was completely directed at the planning, leading and maintaining of the firm's operations. We were forced to reorganize our activity and fire some personnel particularly from the tools production department (Manager A, 1/1996).

The initiative for a special club as a forum for interfirm collaboration reflected the new ideas of networks and networking of the 1990s. Manager A and Manager B participated actively in the founding process in 1991-1993. The detailed history of *the Club* is given in Chapter 5, so it will not be discussed here. I will, among other things, analyze the motives for joining the Club.

It was presumed that interfirm collaboration would gradually emerge when the managers learned to know each other and each other's business. Also, learning from each other was seen as a central element in the future activity. FIMET (Federation of Finnish Metal, Engineering and Electrotechnical Industries) invited me and Manager B to the meeting where the idea was put forth. We had earlier participated in the process of forming a working group for the subcontracting branch within the FIMET (Manager A, 1/1996).

Manager A and Manager B were ready to proceed even further, beyond the Club, in the interfirm collaboration. In 1995, they founded a jointly-owned subcontracting company, specialized in small sheet metal parts and small series production for the electro-technical industry. Another jointly-owned company was born in 1996 by outsourcing a unit of specific sheet-metal-working technology that represented a minor line of business in both firms' activity. This was the start of a collaborative group called *the Alliance* (Table 3.1). This collaboration finally led to the fusion of the Alliance firms, at the end of 2000.

**Table 3.1** Founder companies of the Alliance 1997

<b>Firm</b>	<b>Core competence</b>	<b>Position in the Alliance</b>
<b>A</b>	Large-scale serial production of helical springs and form springs. Leading spring manufacturer in Finland. Family-owned, founded in 1941.	Biggest partner in the volume of annual sale and the number of personnel. Manager A is the primus motor of the Alliance. Firm is located in the Helsinki area.
<b>B</b>	Design and manufacture of thin-walled seamless metal components. Family-owned, founded in 1886 (reorganized in 1986).	Long partnership with A. Production was moved to Central Finland in 1996. Sales, marketing, tools production and technology development stayed in Helsinki.
<b>Aa</b>	Small-scale serial production of helical springs and form springs.	A subsidiary of A since 1989. Sales and material supplies through A. Small firm in Central Finland.
<b>AB1</b>	Small-scale serial production of small sheet metal parts for the electrical and electronics industries.	Founded by A and B and a third partner in 1995. In addition to the main customers, AB 1 serves other Alliance firms in the production of prototypes. Located in the Helsinki area.
<b>AB2</b>	Large-scale serial production of small and medium-sized sheet metal parts for the large-volume manufacturing industry.	Founded by A and B in 1996. The automated pressing technology from A and B was allocated to AB 2. The staff came from B. Located in Helsinki, at the former site of B.

In 1997, the management group of the Alliance started a project for developing collaboration between the Alliance firms, which were Firm A, Firm B, two new firms (AB 1 and AB 2) and a daughter company of A (Firm Aa). Besides business goals, the managers emphasized a careful preparation of the personnel to face the future collaboration within the frame of the Alliance. Mainly for this purpose, the project received financial support from the National Programme for Workplace Development, in 1998 - 2000<sup>18</sup>. Manager A concluded:

<sup>18</sup> I joined the project as a project researcher, which gave me an opportunity to expand the scope of my research towards the worker level of the networks.

During the Project, the initial ideas of the managers, concerning ownership, the development of the firm and collaboration, changed. The Alliance and the planned business concern were still based on the idea of separately functioning firms. Towards the end of the Project, we have come up with a decision to merge into one company from 2001. The future vision has taken form, based on the growth that, in the coming ten years, will lead the company to act as a global system supplier. Thus, we have carried out a significant and unique development process since 1997, without anticipating the outcome (Manager A, 1/1996).

### 3.4 Conclusion

Finnish post-war metal-working subcontracting has developed from a fragmented sector to a well-organized activity. Its history has been bound up with the main suppliers of the large-scale industry and the overall trends towards specialization and internalization of the industrial sector of Finland.

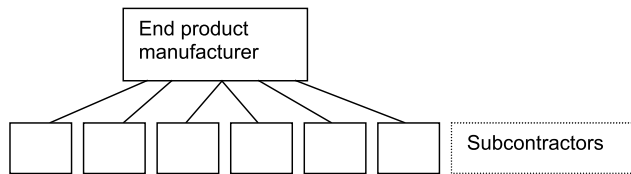
Small workshops, attending to the needs of one or two local customers, have been replaced by companies using high technology for the production of a range of products and services to a nationwide clientele. Some have developed products of their own alongside the subcontracting. Some supply their customers with design work in addition to manufacturing work. Some have pursued partnership-relations with the customer in order to enhance long-range development for their firms. New firms have emerged offering the customer assembling service of readymade components. A large proportion of the production of these companies is exported through their main suppliers.

One can discern certain historical periods of development of interfirm collaboration among the subcontracting firms. They are summarized in Table 3.2. The relationship with main suppliers is included as an important contextual element of collaboration. I have drawn on typologies of the main supplier – subcontractor relationship, applied in Finnish industrial studies (Lehtinen, 1991; 2001; Hyötyläinen et al., 1997; Karjalainen, Maijala & Lindgren, 1999). In these studies, the types or levels of the relationship are conceptualized as developmental steps taken by firms, rather than an ongoing historical change in the industrial relationships. However, they can be reinterpreted historically by locating them in the periods analyzed in accordance with other historical sources used in this analysis.

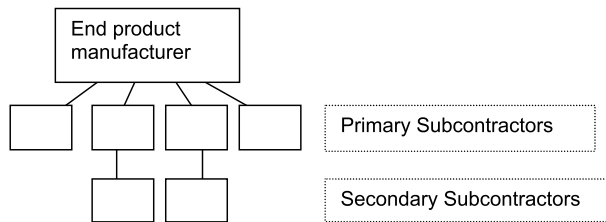
The three phases in Figure 3.1 support the periodization summarized in Table 3.2. Thus, Phase I in Figure 3.1 depicts the situation during periods I and II (Table 3.2) up to the 1970s, Phase II in the figure corresponds to Period III in

the table up to the 1990s, and Phase III to Period IV, challenged by a networking type of collaboration at the start of the 1990s. Lehtinen (1991, p. 25) puts it briefly: “[Phase III] in the figure shows, in a simplified manner, the probable model of the subcontracting network of an end product manufacturer in the future”<sup>19</sup>.

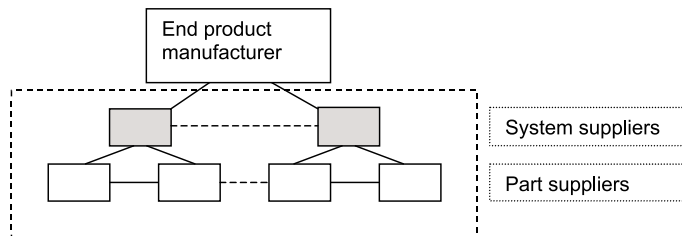
### PHASE I



### PHASE II



### PHASE III



**Figure 3.1** The transformation of a Finnish subcontracting system (Lehtinen 1991, p. 27)

In Table 3.2, the characterizations of the relationship with main suppliers, as well as the *leading collaborative activity* and the *object of collaboration* in each phase, are generalized, ideal types. In reality, they have existed partly concurrently and juxtaposed. Returning to the main question of this chapter, the learning challenge of each period is formulated as a *historical hypothesis* of a dominant developmental contradiction to be solved through collaboration. The underlined

<sup>19</sup> Original text: “Kuvassa 8.c. [vaihe III, HT.] on yksinkertaistettuna todennäköinen malli lopputuotteen valmistajan alihankintaverkolla tulevaisuudessa” (Lehtinen, 1991, p. 25). Lehtinen (2001) has further elaborated these ideas in her study on the evolution of supply chains and subcontractors in the metal and electronics industry.

words refer to the solution suggested for each period. It formed the basis of collaboration in the next period and triggered a new contradiction. The hypothesis for the final period points at the *zone of proximal development* to be worked on through the empirical analyses<sup>20</sup>.

**Table 3.2** Historical hypothesis: Learning challenges of interfirm collaboration among metal-working subcontracting companies in Finland

<b>PERIOD / LEADING COLLABORATIVE ACTIVITY</b>	<b>RELATION WITH MAIN SUPPLIER</b> 1 Type of relationship 2 Basis of subcontracting 3 Ideal type of relationship	<b>EMERGING OBJECT OF COLLABORATION</b>	<b>LEARNING CHALLENGE in terms of developmental contradiction</b>
<b>I</b> <b>1945 – 1955</b> “Survival”	1 Secondary 2 Domestic civil production 3 Not articulated	Continuity of production	Dependency vs. <u>Independency</u>
<b>II</b> <b>1956 – 1968</b> “Lobbying”	1 Unsystematic 2 Price competition 3 Capacity subcontracting	Status in labor market	Political interests vs. <u>Business interests</u>
<b>III</b> <b>1969 – 1990</b> “Marketing”	1 Stabilized 2 Economic efficiency 3 Part supplying	Position in supply chain	Competition vs. <u>Cooperation</u>
<b>IV</b> <b>1991 –</b> “Production”	1 Specialized 2 Production technology 3 Contract supplying, customization	Formation of production networks	Part subcontracting vs. <u>System supplying</u>
<b>The zone of proximal development</b> “Design”	1 Integrated 2 Product design 3 Partnership	Product development	Production vs. Co-configuration

<sup>20</sup> The concepts of a historical hypothesis, the zone of proximal development, and contradiction are presented in Chapter 2, section 2.4.



The first period dates from the years 1945 – 1955, which was the time of the post-war reconstruction and indemnity production. The State had a leading role in regulating prices and wages as well as the supply of raw materials and investments. Priority was given to the heavy metal-working industry. In this regard, the position of the subcontractors was *secondary*, firms being small and scattered, serving mainly local main suppliers. The main interest of the small and medium-sized firms in these circumstances was to provide for the *continuity of their production*. Thus, *survival* can be seen as the leading “collaborative activity,” which, of course, is not actually an activity system of its own. It was performed by the employer association on the level of the State policy. Under post-war conditions, the ideological-economical industry association also had to take on the labor market issues in order to attend to the interests of the small and medium-sized industries. The labor contracts of small and medium-sized metal-working industries followed the labor market policy of the large-scale metal-working industry. The problem to be solved through collaboration was whether to remain subordinated and *dependent* on the main suppliers and the labor politics of the large-scale industry, or to unite within the small industry and strengthen its position on the market. Towards the end of the period, *independent* status was gained on the organizational level, although still excluding the smallest firms and some branches of the metal-working industry.

The next phase, from the mid 1950s until the end of the 1960s, was the time of professional organization of the small metal-working industry. The relationship between subcontractors and main suppliers during the 1960s is often characterized as *capacity subcontracting*, balancing the production of large firms in the overload situation. The use of the subcontracting relationship was *unsystematic*, performed through *price competition* as one-off deliveries. The interfirm collaboration among the subcontractors was aimed at strengthening the status in the *labor market*. Typical collaborative activities were organization activities and *lobbying* on the local and State levels. District organizations were founded, which brought collaboration nearer to single firms. This phase resulted in the unification of small and medium-sized metal-working industries through uniting the separate professional associations into one organization, in 1968. This line of development finally led to the unification of the whole metal-working sector, in 1975. However, the start of the new phase of interfirm collaboration can be dated back to the end of the 1960s. The focus of collaboration of the small and medium-sized companies shifted more and more to the improvement of production and marketing activities, in order to strengthen the status of subcontracting in the supply chain. Thus, the object of collaboration changed *from labor politics towards business activity*, even though the former still continued to play an important role.

Throughout the 1970s and 1980s, the collaboration of small and medium-sized firms was focused on *stabilizing the position in the supply chain*. The main suppliers used subcontracting on the basis of *economic efficiency* rather than single capacity compensation. However, subcontracting in terms of part supplying was not utilized on a large scale, if compared with the practices in neighboring Sweden and other European countries. During this period, firms were developing towards modern production and management systems. Horizontal collaboration was typically enhanced in *marketing and training* activities. Focusing on the business issues aggravated the *competitive tension* between the subcontracting firms. Collaborative production among subcontractors was still rare. This period ended with economic globalization, but it was, finally, the economic crisis of the 1990s that most dramatically affected the restructuring of the metal-working subcontracting, as well as entire modes of industrial production. The main suppliers started to reorganize their subcontracting networks into first-tier suppliers and second-tier suppliers. Collaboration among the subcontractors was needed to solve the problem of how to ensure their *position as first-tier suppliers in the production network*. (In Figure 3.1, the first-tier equals primary subcontractors, the second-tier secondary subcontractors.)

The last phase in the observed time covers the 1990s through the 2000s. It builds upon the development work of the past decades. The relationship between main suppliers and subcontractors was now conceptualized in terms of the core competencies and *technological specialization* of firms. Collaborators aimed at long-term contracts, including system supplying and *customization*. During the recession, those firms doing only subcontracting on a narrow basis, providing single parts to one or two customers only, were most prone to disappear. The established subcontractors sought collaboration with each other, with customers and partners outside the business domain, in order to gain a position in *production networks*. A new form of collaboration was *system supplying*, which includes supplying a customer with systems and product entities for the end product, and contributing to product development. Characteristically, collaboration was sought on a broader basis than before, thus exceeding the coverage of business goals in a narrow sense. Managers of small firms gathered together to discuss the potential of collaboration in general, as my research case will show. The emerging problem was the scope of collaboration, particularly in the production activity. Firms had to decide whether to pursue collaboration in the frame of the *traditional subcontracting*, or to expand to *system supplying* in the frame of the new network modes of organizing the production activity.

Even though the ideal of “*partnership*” with long-term contracts, high commitment, knowledge sharing and trust was articulated during the 1990s by many firms, I will locate it in the zone of proximal development of this period. One

of the touchstones and boundaries to be crossed in a partnership relationship is the design activity. Victor and Boynton (1998) have described the emerging type of cooperation as *co-configuration*, which builds an ongoing relationship between the customer, product and the company. Co-configuration follows the preceding phases of craft, mass production, process enhancement and mass customization, describing the collaborative work carried out in networks of partners.

When a firm does co-configuration work, it creates a product that can learn and adapt, but it also builds an ongoing relationship between each customer-product pair and the company. (—)

Unlike previous work, co-configuration never results in a 'finished' product. Instead, a living, growing network develops between customer, product, and company. (Victor & Boynton 1998, pp. 195, 196.)

Some of the subcontractors met in this study already approached co-configuration-type work by developing design departments in collaboration with their customers, whereas others held fast determinedly to the production activity. Obviously, because of partnerships, the subcontracting firms had to learn comprehensive system supplying in their mutual collaboration. Whether the shared design activity was the learning challenge for the horizontal relationships in the same manner as for the vertical customer-subcontractor relations was not yet clearly to be seen.

Outlining the history of collaboration among the subcontracting companies generated the first hypothesis of the future learning challenges. This hypothesis, understood in terms of the zone of proximal development, will be further elaborated and specified in the analyses to follow.

## 4 Research questions and data collection

The foregoing suggests that learning in networks should be analyzed as a multilevel phenomenon with simultaneously ongoing intertwined processes across the various levels. What the levels are must be worked out in each research case. To state outright that it is the interorganizational level being addressed does not inform a network researcher. Learning is to be understood through the contradictions and tensions faced by the actors participating in the creation of new activity. It was also shown that collaboration in networks really was a learning challenge to the Finnish firms during the period studied, causing the managers and other participants to critically evaluate their previous practices and collaborative relationships.

*In the remaining part of this study, networks and learning are analyzed by means of four case studies on interfirm collaboration. New perspectives are sought by applying the activity-theoretical approach, as outlined in the preceding chapters. To do this, I will put forth the research questions (section 4.1). I will present the data and data-gathering methods (section 4.2). I will also discuss units of data as a pragmatic question of organizing the data in hierarchical entities to be analyzed in Chapters 5-8 (section 4.3). The overview of the questions, data and methods is given in Tables 4.1 and 4.3 and the accompanying text. These will subsequently be specified in the context of the concrete cases.*

### 4.1 Research questions

This study is structured by four research questions. One chapter of the following analyses will be devoted to each of them. The broader context of the questions will be constructed in Chapter 5, addressing the overall learning history of the Club.

## Chapter 5:

1 What do network typologies and network evolution tell about learning when interpreted through developmental contradictions and expansive learning?

The object of research is *the Club* as a network organization and its first five years of development, leading from an overall network ideology to the formation of a multifaceted forum for collaboration. The emergence of the multilevel learning is analyzed and interpreted by means of the cycle of expansive learning. Simultaneously with the learning problem, the methods of network analysis are elaborated, working out three approaches: the synchronic analysis with network typologies, the diachronic analysis with historical events, and the dialectical analysis with developmental contradictions. The research data derives from archives, interviews and participant observation of the Club's activity.

## Chapter 6:

2 How does the network learn to model its project activity when encountering the firm-network tension?

The activity of the Club is further analyzed by focusing on collaborative business projects members planned in their meetings. The question of the participants was basically: How should the Club introduce itself to its customers, through separate member firms or as a group or a network? I shall interpret the debates on two customer projects, at two different points of time, through the firm-network tension that shapes both the discussion and the outcomes of the projects. It may be hypothesized that the more the perspective is that of a network, the more joint projects become a learning opportunity for the entire network, not just of single members and subgroups. The main data consists of meeting debates, which are analyzed as series of discursive actions, especially focusing on the episodes of disagreement and tension. In addition, the historical data basis of the preceding chapter is used.

## Chapter 7:

3 What is the role of trust and its contribution to learning in a complex production process run in a network?

The focus is shifted from the Club organization to a single member firm that determinedly takes the Club network into use in a production process. Emerging problems of collaboration and solutions created are examined in connection with the product and its design process. The analysis aims at showing how the problems and potentialities of trust are closely related with the mutually-

shared vision of the object of collaboration. The data stems from participant observation, field ethnography, and interviews.

Chapter 8:

4 How can interorganizational collaboration enhance the workers' needs for development and learning at work?

The context of the worker-level analysis is a business group called the *Alliance*, emerging from collaboration within the frame of the Club (Section 3.3). To support its ambition for substantial business growth, the group carried out a project entitled "Together We Are More." For a researcher, the project offered an opportunity to study a question that had already come up in the context of the Club, namely: Under what conditions will networks and networking spread beyond the management level to reach the every-day practices of the shop-floor workers? The worker level is studied through the phases of a teamwork project, starting from the "Developmental Dialogue" intervention. The data is discursive, derived from interfirm discussions. The data consists of the developmental dialogues of small groups formed in the intervention, and discussions of the project group that developed teamwork for the Alliance firms.

## 4.2 Data collection

The research questions, the methods of data collection, and characteristics of data are presented in Table 4.1. It should be noticed that the data for each research question varies considerably, deriving from different historical phases and different domains of collaboration in the network. ("The project" in Table 4.1 refers to different processes to be addressed in chapters 6-8.) The detailed presentation of all the data, detached from the context, would not serve the reader here. In ethnographic studies such as this, the presentation of the data and the construction of the cases are methodologically incorporated in the analysis. Therefore, each empirical chapter will include a section for specified data and methods.

**Table 4.1** Research questions, data collection and data

<b>Chapter</b>	<b>Research question</b>	<b>Data collection</b>	<b>Data (years)</b>
5 From ideal types to heterogeneous collaboration: Developmental challenges of a subcontracting network	1 What does network evolution tell about learning when interpreted through developmental contradictions and expansive learning?	Interview Archives Participant observation	Interview with key participants Meeting discussions of the Club (1995-1996) Archives of the Club (1993-1996)
6 Firm or network? Modeling collaborative project activity	How does the network learn to model its project activity when encountering the firm-network tension?	Participant observation Interview Archives	Meeting discussion of the Club on the central projects Interview with key participants (1995-1998) Meeting protocols and memos (1994-1998)
7 Trust-In-Time? Learning to manage collaborative production	3 What is the role of trust and its contribution to learning in a complex production process run in a network?	Shadowing Interview Archives	Videotaped material on collaboration Interview with key participants Written documents of the central project (1996)
8 Bringing worker perspective into interorganizational collaboration and learning	4 How can interorganizational collaboration enhance workers' needs for development and learning at work?	Intervention Participant observation Interview	Developmental Dialogue Meeting discussion on the central project Interview with key participants (1998-1999)

In ethnographic studies, researchers use a wide range of methods and sources of data to gain deep enough understanding of the object. This kind of triangulation, or crystallization (Janesick, 2000, pp. 391, 392), is considered a procedure for providing validity and reliability of qualitative research. Triangulation, however, involves a lot of effort and intellectual capital put in a project by a researcher. Certainly, the data-collecting methods differ in terms of a researcher's in-

involvement in the production of data, having a different bearing on the ownership of data. Compare, for instance, drawing from the files of written documents typical for an ordinary historical analysis, and applying a developmental or educational intervention as a data-generating method. The methods of data collection used in this study are (with an increasing rate of ownership): Study of archives, participant observation, shadowing, interview, and intervention.

### Archives

Archives were one of the major sources of data in studying the history of the Club (Chapter 5). They include written documents, such as meeting protocols and memos of the Board and the member meetings, drafts, plans, and correspondence concerning the activity of the Club. The use of e-mail and the Internet were generally not adopted earlier than in the late 1990s, among the firms in question. Therefore, such materials were not available when studying the early years of the Club.

In general, I was allowed to use the archive material of the Club freely for my research work. In projects involving customer relations of member firms, like in cases of Chapters 6 and 7, I usually had access to documents during the fieldwork, but was not allowed to display all material (customer correspondence, blueprints of products) in reports.

### Participant observation

Participant observation within the Club was pursued during the half-yearly member meetings, each lasting two days. I audiotaped and usually also videotaped the meeting discussions, and participated in numerous informal discussions and interaction situations among the Club members. Field notes, written down during participation or immediately after the observed situations, were used as complementary data.

During the research project 1995-1998, I participated in most of the meetings, being invited to them as if I were a member. Meetings are the most important source of data in Chapter 6, but participant observation was crucial throughout the study of the activities of the *Club* and the *Alliance*. I spent one week in the office of the Club observing the coordinator's work, while simultaneously examining the archives. I followed the coordinator and the President of the Club during their field visit to a newcomer and to an old member company. In the case of the *Alliance* (Chapter 8), I visited the central firms at least twice, videotaping production sites and interviewing people.



## Shadowing

Shadowing was the most important method of data collection in the case analyzed in Chapter 7. This means, literally, following the key participants for a given, intensive period of time, such as one workday. Reder (1993) related the shadowing technique to polycontextuality (members of work groups are engaged in multiple ongoing tasks) and heterochronicity (work group's activity is organized with respect to multiple underlying time frames). His study addresses project-oriented group work that is accomplished "through an apparent mosaic of activity, dispersed over time, space, and interactants in highly complex ways" (ibid., p. 118). Thus, shadowing seems to lend itself well to network research. I view it as a challenging method requiring mutual confidence between the researcher and those whose activity is followed. Its use is restricted if a great number of people are involved who have not been acquainted with the method beforehand, and if the material environment contains items and customer-related information which are not allowed to be photographed.

In the case of Chapter 7, shadowing was used selectively during a two-week period of the most intensive phase of the production project. I spent 2 – 6 hours at a time over four separate days in two partner firms following the project manager of the central firm (Firm Alpha) in work situations involving interfirm collaboration. Shadowing was implemented by videotaping, on-line interviewing, and writing field notes.

## Interview

Semi-structured thematic interviews were conducted with key participants of the Club and projects under study. On-line interviews resembling *ad hoc* discussions were carried out, while shadowing and pursuing participant observation. In some occasions, interviews were implemented as "mini-interventions," allowing the researcher to give feedback about the observations and findings of the given project (Chapter 7)<sup>21</sup>.

Thematic interviews, lasting one hour in average, were carried out while visiting firms, which gave me an opportunity to talk with several persons working

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<sup>21</sup> This may not be widely acknowledged as a method of interview. The researcher intervention is more readily labelled as an ethical question of manipulation, as Fontana and Frey (2000, p. 662) point out: "A growing number of scholars (...) feel that most of traditional in-depth interviewing is unethical, whether wittingly or unwittingly. The techniques and tactics of interviewing, they say, are really ways of manipulating the respondents while treating them as objects or numbers rather than individual human beings." The active interview (Holstein & Gubrium, 1995) draws attention to interaction, reality-construction, and meaning-making, but does not discuss intervention in the context of interviewing.

in a firm, and observe the production sites. Even the most *ad hoc* interviews were guided by an object-oriented research interest. The researcher could ask clarifying questions *in situ*, or conduct more formal interviews while participating in the activities. All interviews were audiotaped.

## Intervention

Intervention is used in various parts of my study. Minor interventions were presentations I held in the member meetings of the Club, giving feedback to the members of the Club. Those presentations provoked debate and further reflection on the theme analyzed (Chapter 6). Feedback interviews, mentioned above, were also minor researcher interventions.

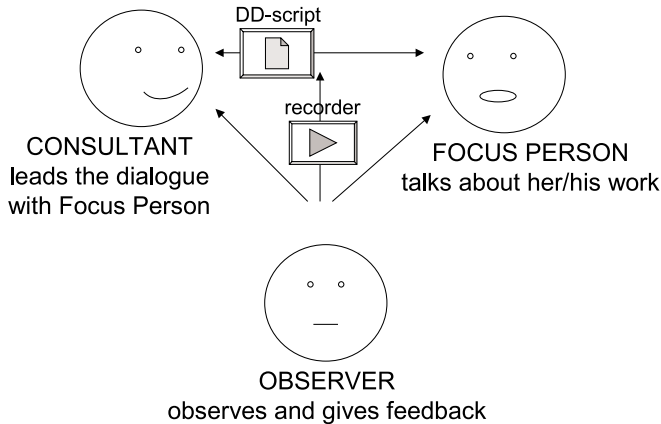
Intervention was used most determinedly when carrying out the Developmental Dialogue process (DD) among the firms of the Alliance (Chapter 8). The Developmental Dialogue procedure was originally adopted from a Danish researcher, Laura Mott, and her colleagues (Mott, 1992). They were looking for educational methods for work life, which would support actors to become assertive professionals. This referred to actors capable of developing themselves as professionals, ready to influence and create their work practices as active subjects, and capable of surmounting the strategy of adaptation that the researchers saw characterizing many organizations in the industrial society.

In Finland, the researchers of the Center for Activity Theory and Developmental Work Research have elaborated the method<sup>22</sup>. Developmental dialogues are systematic conversations carried out in small groups, kinds of reflecting teams with designated roles of discourse (Figure 4.1). The major outcome for each participant is the determination of the zone of proximal development, materialized into a developmental project. In my research project, DD was applied to enhance interfirm collaboration among workers of production.

In small groups, each participant acts in each role in turn. Being a Focus Person means that his or her work and life situation are being discussed according to a given script. A Consultant leads the dialogue by means of the script, helping the Focus Person express his or her thoughts. An Observer sees to it that the Focus Person is being listened to and counsels the Consultant at given moments. When led by one DD leader, the number of small groups must be limited in order to keep the process under control. Dialogue sessions are always audiotaped. We also videotaped the joint introductory sessions lead by the DD-leader, involving comments and discussion by the participants.

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<sup>22</sup> In this research, I built upon the work of Kirsi Koistinen and Jaakko Virkkunen who have most developed the DD approach.



**Figure 4.1** Setting of Developmental Dialogue group

**Textbox 4.1** The Developmental Dialogue process

The Developmental Dialogue process consists of three sessions carried out every two or three weeks, and of intermediate tasks between the sessions: 1) In the first session, the DD leader introduces the procedure and tells what the participants are meant to do. The developmental dialogues with each group member are conducted and audio-taped (the duration of each is 90 minutes). Before the second session, each one listens to her dialogue on the tape. In addition, each one listens to the taped dialogue of the group member for whom she acted as a consultant. When listening to the tape, notes are written down on a form sheet, concerning one's resources and strengths, personal styles, challenges and developmental goals and motives. 2) In the second session, the small groups continue working in the same manner and roles as in the first session. The DD leader is still active, helping the groups proceed. Now the object of discussions are the results of the first session's developmental dialogues, from which participants continue to work out the zones of proximal development. The filled-in forms constitute an essential tool. The focus person has two sheets of paper in front of her, one filled in by herself and the other by her consultant when listening to the tape. Personal developmental tasks or projects gradually begin to take shape. The intermediate task between the second and the third meetings concerns the construction of a personal project. 3) The third session is aimed at working on the personal developmental projects, making them as concrete and viable as possible. The small groups are gathered only for a while, whereas the main work takes place in the whole group. Each one presents to the others the developmental task she is going to accomplish. The DD leader sums up the results and makes tentative groupings of themes, out of the personal projects presented by the participants. In the end, the group discusses the future actions and the follow-up of the process, usually involving appointed evaluation meetings of the participants.

The above-described field methods bear resemblance to the approach known as action research (e.g. Whyte, 1991). Like in action research, the methods informed by activity theory and developmental work research are grounded in social practices, allowing and calling for the active participation of practitioners in organizations and communities. Moreover, the research is motivated by its potential of contributing to social action, change, and learning. Some critical differences have also been discussed (e.g. Engeström, 1994). In the study at hand, essential distinguishing features are found in Chapter 2.4 where the activity-theoretical tools for studying learning in networks are formulated. Concepts such as historicity, contradictions and zone of proximal development are determinedly used and elaborated as tools for change in the course of the research process. Action research, on the other hand, seems to avoid high theoretical conceptualization of the practices and problems observed. Change is rather thought to develop from open dialogue, democratic interaction and participation in and across communities. In addition, in my view, the resources for systematic and rigorous data collection and analysis (in Section 4.3) have to be found from sources other than those offered by action research.

### Recording and transcription of the data

Interviews and meeting discussions, and most of the participant observations were tape-recorded. Videotaping was mainly used in shadowing and participant observation, and in the documentation of the meetings. In the Developmental Dialogue intervention, we tape-recorded the small group discussions and videotaped the joint sessions given by the DD leader. Field notes written during the situations observed or soon afterwards were an important supplement to audio and video recordings.

All tape-recorded data, collected by participant observation, shadowing, interview and intervention, was transcribed. Videotaped data was transcribed selectively, when needed to complete the audio material. After selecting the material to be analyzed, I listened to it once again to make sure that the transcription corresponded to the talk recorded on tapes.

**Table 4.2** Transcription conventions

Convention	Meaning
<u>Word</u>	word(s) with special emphasis
(word) or (-)	unclear word
Word...	turn or sentence remains unfinished
##	overlapping speech
...word	turn continues from the same speaker's previous turn
[word]	researcher's comments added
(/)	whole sentences are cut out

The contexts of speech situations, even though informal in nature, were those of organized meetings, small group discussions, and interviews focusing on a specific theme to be worked out. The analysis of the discursive data is not primarily aimed at exploring *how* the speech was produced, but *what* was being said (by whom) about the object of collaboration in a given situation. The transcription conventions are listed in Table 4.2<sup>23</sup>.

### 4.3 Units of data

The need for organizing the research data in hierarchical units arises from the nature of data collected, and the events this data is based on. By this I refer to the multiple collaborative processes going on in a network and subnetworks, scattered and heterogeneous as they are both in time and space. The unit of data is a pragmatic-technical construction not equal with the theoretical-methodological question of the unit of analysis (see Chapter 2)<sup>24</sup>. Similar or related units have been used recently in several activity-theoretical analyses (R. Engeström, 1999; Kärkkäinen, 1999; Haavisto, 2002). However, it seems that analytical tools of this level must be somewhat tailored for each study.

<sup>23</sup> Transcription conventions of the similar level of accuracy have been used, recently, in activity-theoretical studies on work activity (e.g., Haavisto, 2002).

<sup>24</sup> The definition of units, both in pragmatic-technical sense and in theoretical-methodological sense, is central in carrying out analyses. The terminology of qualitative research is not stabilized; researchers may refer to the unit of analysis both in pragmatic and methodological sense. It seems that the question of units easily gets short shrift in qualitative methodology. For instance, "unit" cannot be found in the subject index of either of the two recently published handbooks of this domain (Denzin & Lincoln, 2000; Atkinson et al., 2001).

This analysis rests mainly on discourse materials. Cicourel (1994) pointed out that researchers' orientations in this field vary depending on the analytic goals. The major dividing line between approaches is to which extent, if any, they take contextual cues of talk into account. Cicourel (1994, p. 87) stressed "the importance of generating a narrative account of the larger corpus of material from which segments are to be analyzed in detail."

In suggesting using narrative and descriptive categories in a first attempt at contextualizing our analysis, we already assume that the researcher possesses some ethnographic or organizational or demographic information about the setting and the participants, and that he or she will be making extensive use of his or her tacit and explicit knowledge of language (Cicourel 1994, p. 87).

I will follow this principle when defining the units of data (Table 4.3). I discern three units: a *trajectory*, a *phase*, and an *episode*. Each of them is theoretically bounded by the *object* of collaboration. A trajectory contains the life cycle of a *project* analyzed, in which a phase is bounded by a major *shift of the focus* during a given project. An episode is the smallest unit of data for analyzing the central *tension* emerging in collaborative object construction. In discussion episodes, the object generates the *topics* of discourse.

The historical analysis of the Club (Chapter 5) differs from the project-based analyses of the chapters 6 to 8 regarding the hierarchy of units. A time span of the overall history is not defined in terms of a trajectory. The formulation of event/phase in the historical analysis is largely based on the meaning giving by the participants, whereas phases in other cases are primarily constructions of the researcher.

As the data and the object of analysis are slightly different in each chapter, the units of data have to be specified correspondingly (Table 4.3). Common to all project-based analyses (Chapters 6-8) are *shifts of focus* in framing the phases and *turning points* in bounding the episodes. A *shift* stands for changes in the lifecycle of a given project as it proceeds from a preparatory phase (a plan) to implementation (materialization of object) and closure (outcomes). It can best be defined in terms of the social-spatial changes of a given subnetwork (*who* are involved at a given time; Engeström, 2001b). A focus shift, as such, does not automatically imply expansion of an object.

**Table 4.3** Units of data

Unit	Chapter 5	Chapter 6	Chapter 7	Chapter 8
Trajectory	-	Trajectories of two projects of the Club, addressing Customer Cases 1 (1994-96) and 2 (1997-98)	Production project of a member firm, involving collaboration within a subnetwork of Club	The evolution of teamwork from worker's (Mikko's) perspective
Phase	Historical phases of the Club are specified by a concept "event/phase", which relates the major focus of object construction of the Club (event) with a larger period of development (phase) that an event is embedded in.	1) Articulation 2) Handling 3) Closure 4) Reflection	Design phase is chosen for the analysis of the central tension	Six phases from the search of a personal developmental task for Mikko to implementing teamwork in production of Mikko's firm
Episode	-	Discussion episode: Customer case as a topic, bounded by disagreements, dilemmas and turning points (Related to the firm-network tension)	Design episode: Design of the flange joint as the object, bounded by turning points (Related to the trust-in-time tension)	Discussion episode: Teamwork of Firm Aa as a topic, bounded by the emergence of topic and turning points (Related to the tension of emerging worker perspective)

A *turning point* stands for new insights and perspectives appearing in the discussion and, consequently, changing the course of the discussion. Kärkkäinen (1999) demonstrated how turning points of discourse led to widening the ob-

ject of collaboration. This is consistent with my use of turning points. However, turning points may also lead to narrowing or fragmenting the object, therefore, at least momentarily, preventing expansive learning. I will discuss turning points as they emerge in analyses and in the concluding chapter (Chapter 9) of this study.

Trajectories and phases construct the cases analyzed in the chapters 6-8. For a reader, they should be followed through in the text. On the contrary, discussion episodes and design episodes are not always reported in a full length, but in excerpts. I will give an example of an episode as it is used in chapters 6, 7 and 8, respectively.

*Discussion episode/Chapter 6:* Customer case as a topic, bounded by disagreements, dilemmas and turning points in a situated conversational exchange. The discussion episode starts when an agreement on the topic “Customer case 1” changes to a disagreement. It ends when the disagreement changes to a neutral talk on the topic (see Excerpt 6.4, Chapter 6).

*Excerpt 4.1*

*Member 4:* Right, and the more we can get the brochures of the Club onto the desktops of the buyers, [the more they will realize] this is a solution to their bunch of blueprints.

*Member 1:* OK, it’s one way of exerting pressure.

*Member ?:* On that level, yes.

*Member 4:* ## Yeah, and now... On every level, yes. And now we must come to terms with whether we, who know these people, will continue the inner discussion on the lower level, or whether this will lead to a situation in which everything is organized through Manager X [Customer 1]? To know how to proceed...

*Member 3:* I am not against that kind of activity. It’s important, of course, but it is not a solution to the question of how we could get in and present ourselves, really as a group. What this group [stands for]... Or how, by means of the group, they could gain some [advantage] they haven’t been able to gain through a normal subcontracting network. It’s a regular kind of job to present oneself and give information [that Member 4 suggested], but, in my view, this is not the best way to advance our project.

*Member 4:* Are you afraid of losing something in this?

*Member 3:* No, I won’t lose anything. I can advertise here, I would get much more, [the Firm] would get much more work [from Customer 1], but I want to limit it to a certain level with this con-



cept.

*Member 10:* [Kidding.] Yeah, he got such a big (-) [order from Customer 1].

*Member 3:* No, it's not just that, but with this concept. It's still easy to take away certain elements. But if we proceed to take care of larger systems, in that case, I have told them, I want to expand.

*Member 1:* Hey, let's think about this, let's summarize this discussion.

What will be the time schedule for each of these issues? (//)

(Meeting 11/95)

*Design episode/Chapter 7:* Design of the flange joint as the object, bounded by turning points in a design process. A new design episode starts when a major change (either expansion or breakdown) of the design object takes place. These kinds of turning points are constructed on the basis of the post-hoc accounts of the participants, and by tracing the changes in the design in question. For example, the account given by Production Manager D from the manufacturing firm constructs the turning point that led to encountering the problems of Design 1 (see Excerpt 7.5, Chapter 7).

*Excerpt 4.2*

I visited [Alpha's office] and handed over my offer, including the estimation on what the production of these parts would cost. And, at that phase, [the Project Manager of Alpha] said that something was wrong, as the costs exceeded the entire budget. They started to check the design and found out that it was too complicated, consisting of too many parts, which accrued the expenses. (*Production Manager D, 03/1996*)

*Discussion episode/Chapter 8:* Teamwork of Firm Aa as a topic, bounded by the emergence and turning points of the topic in a situated conversational exchange. The following example episode does not contain any turning point. The discussion episode starts when the topic "teamwork at Firm B" changes to "teamwork at Firm Aa." It ends when "teamwork at Firm Aa" changes to "teamwork in Firm X" outside the Alliance (see Excerpt 8.19, Chapter 8).

*Excerpt 4.3*

(//)

*Liisa/B:* It was not so easy to start teamwork here, either. (//) [We felt that] we kept on working as before, as if there were no teams. [Laugh.]

*Trainer B:* It varies, really, team-by-team how it (starts to work).

*Liisa/B:* Yeah, right.

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*Worker B1/B:* ## (-) You said that teams have fallen flat. What do you mean by that?

*Mikko/Aa:* They are, in principle, in action, but as we've got many jobs going on simultaneously, we can't do them in teams, but it varies a lot.

*Liisa/B:* So you mean you have appointed to teams work areas; what belongs...

*Mikko/Aa:* In principle, I mean, as based on the machines, but now (-)...

*Trainer Aa:* ## Basically based on the machines.

*Liisa/B:* ## I see, you can't [work in teams], because you have got other jobs to do.

*Mikko/Aa:* Yeah. We could...

*Manager B:* Go ahead! Call [the sales manager of A] and ask him to stop sending orders, because we are now concentrating on teamwork here! [Jokes, laughter.]

*Trainer Aa:* Yeah, or we only take on such orders that will suit our team.

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*Manager B:* It is typical in this subcontracting business, like in [Firm X], sometime "cells" are nowadays "teams." They have changed systems a little bit (//).

(Meeting 10/98)



## 5 From Ideal Types to Heterogeneous Collaboration: Learning Challenges of a Subcontracting Network

### 5.1 Introduction

This chapter is about modes of explaining success, failure and sustainability of interfirm networks. Two strands of research, analyzing network dynamics from different viewpoints, are more closely examined here, namely synchronic network *typologies* and diachronic *evolutionary* approaches. I will first examine how these approaches help us to understand a network that neither easily fits the existing typologies nor follows the projected paths of success and failure. My research case is then reinterpreted through a third, dialectical approach, namely *activity theory*, which introduces *developmental contradictions* as a mode of understanding networks. On this basis, a framework for *learning in networks* is elaborated.

This study is informed by the notion that both typologies and evolutionary approaches tend to produce rather *ideal-typical conceptualizations of networks*. Typologies are mainly designed to classify the governance structures of interfirm networks, either concentrating solely on economic exchange (Gulati & Singh, 1998) or separating economic from social and communicative linkages (Szarka, 1990). Even the most realistic descriptions of network evolution tend to reconstruct their cases as pure examples of success or failure (Ariño & Torre, 1998; Human & Provan, 2000).

The success-failure perspective turns out to be inadequate in explaining the network dynamics I have studied. As I will demonstrate, *the Club* did not actually reach many of its initial goals. Nevertheless, it continued to work as a cooperative forum for the member firms, even after public financial support was withdrawn. Taking into account the problems and failures faced by the Club at

its starting phase, the question arises: What made this network function and maintain itself several years after its founding? The research question of this chapter is: *What do network typologies and network evolution tell about learning when interpreted through developmental contradictions and expansive learning?*

The concept of *learning challenge* is used much like in Chapter 3, as an intermediate theoretical tool for concretizing the developmental contradictions as they were encountered by the participants and the researcher. In short, learning challenges stand for *contradictions and tensions seen from the point of view of learning*.

One may analyze learning challenges as they emerged in the history of the central activity. On the other hand, one may also form hypotheses on future learning challenges. This happens by identifying developmental tendencies and potentials that point toward the zone of proximal development (ZPD), as discussed in Chapter 2. Learning challenges are not to be understood as given and stable. For participants, learning challenges require efforts to change their activity systems (Seppänen, 2002), whereby the learning challenges themselves are re-articulated and transformed.

In Section 5.2, synchronic, diachronic and dialectical methods for analyzing the nature and processes of interfirm networks are discussed. These methods (analyses of typologies, evolutionary events<sup>25</sup>, and contradictions) are applied each in turn to understand the dynamics of Club, focusing on the birth and early history of the network between 1991 and 1997 (Sections 5.3 – 5.5). The findings are summarized and discussed in Section 5.6.

## 5.2 Methods and data

Synchronic analysis will build here on the critical examination of *network typologies*. Diachronic analysis will draw on *evolutionary events*. Dialectical analysis will introduce *developmental contradictions* embedded in the *cycle of expansive learning*.

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<sup>25</sup> In qualitative research, the use of concepts, such as an *event* and an *episode* varies considerably from one study to another. Reder (1993) defines episodes as clusters of tasks and events; Emerson et al. (2001), on the contrary, define events as series of episodes. The latter view comes closer to my approach. Certainly, there are no universal meanings. My study and concept formation are guided by an orientation toward objects and contradictions, which affects the ways I bound the units of data (Chapter 4).

### Synchronic method: Network typology analysis

Network typologies provide analytical tools for defining the Club network. By means of typologies, formed on the basis of various criteria, I will examine into which category or categories the Club would possibly fall. Typologies used in this study are summarized in Table 5.1, organized by the year of publication. I looked for recent typologies of industrial firms and networks, using different criteria for their classifications. However, the seven studies selected cannot be considered as comprehensively representative of the field.

Alter and Hage (1993) define only multiorganizational or sector-wide relationships as “networks,” whereas dyadic and triadic relationships are “linkages.” Joint ventures, aiming at joint product development, as well as alliances for lobbying belong to Promotional linkages (moderate cooperation), and joint ventures in manufacturing to Production linkages (broad cooperation). In Table 5.1, only the “network” side of the typology is displayed. Therefore, joint ventures and alliances from the “linkage” side are not included in the examples.

A *governance structure* is probably the most common basis of categorizing networks. It may be defined in terms of the nature and degree of *integration* (Perrow, 1992), *formalization and coordination* (Grandori & Soda, 1995) or *control* (Park, 1996; Gulati & Singh, 1998). Alter and Hage (1993), with their *level of collaboration* also fall to some extent into this group.

Another basis for categorizing is the *contents of collaboration*, used to some extent by Szarka (1990) and in particular by Oinas and Packalén (1998). Szarka (1990) is the only one to use the distinction between economic and social determinants as the categorizing principle.

The study of Oinas and Packalén (1998) includes a wide range of criteria, the governance structure being only one among them (Table 5.1). This study differs from the others in taking a wider operational context, the competitive conditions of firms, as one of the leading criteria. The competitive conditions are conceptualized in terms of the life cycle of a product from product development to mature markets. Thus, the resulting four network types (premarket, market, efficiency and command) could also be interpreted as four developmental phases of business networks.

**Table 5.1** Network typologies: previous studies. Nw = Network

Study	Criteria	Categories	Examples
Szarka 1990	Both economic and social determinants of small business networks	1 Exchange networks 2 Communication networks 3 Social networks	1 Trading partners, the production network 2 Non-trading links: consultants, advisors, local and central government, politicians 3 Family, friends, acquaintances
Perrow 1992	Dimension: total integration (make rather than buy) versus deconcentration and independence of firms	Integrated firm – integrated multidivisional firm - conglomerate - holding company or wholly owned subsidiary - joint ventures - subcontracting - small firm network	Forms of economic organizations in the U.S.A. and Europe/Japan
Alter & Hage 1993	Competitive versus symbiotic cooperation; number of organizations involved; the level of cooperation	1 Obligational networks (limited cooperation) 2 Promotional networks (moderate cooperation) 3 Production networks (broad cooperation)	1 Communication nw, social nw, purchasing nw 2 Research consortia, cooperatives, trade associations, unions 3 Cartels
Grandori & Soda 1995	Degree of formalization; mode of coordination: symmetric /asymmetric (parity-based/centralized)	1 Social networks 2 Bureaucratic networks 3 Proprietary networks	1 Personal nws, interlocking directorates, some industrial districts, putting-out, subcontracting 2 Trade associations, consortium, agency nws, licensing, franchising 3 Joint ventures, capital ventures
Park 1996	Mode of control: I Nature of nw governance: - bilateral (mutual adjustment and alliance) - trilateral (voluntary or mandatory) II Type of interdependence: - vertical (complementary) - horizontal (competing)	1 Vertical - trilateral 2 Vertical - Bilateral 3 Horizontal - Bilateral 4 Horizontal-Trilateral	1 Certain long-term contracting, nw for plant construction, certain university-industry nws 2 Long-term contracts, licensing, franchises, joint ventures 3 Cartel, collusion, R&D consortia, research joint ventures, some licensing, joint ventures 4 Trade associations, some hospital consortia, independent federation
Gulati & Singh 1998	Magnitude of hierarchical control	Types of governance structure: 1 Joint venture (high hierarchy) 2 Minority alliance (intermediate hierarchy) 3 Contractual alliance (occasional hierarchy)	1 Joint venture: Separate entity with certain equity conditions and administrative hierarchy 2 No new entity, one partner taking minority equity position in the other(s); Investing partner joining the investee board. 3 a) Unidirectional agreements: licensing, second-sourcing, distribution agreements b) Bidirectional agreements: joint contacts, technology exchange agreements
Oinas & Packalén 1998	Key dimensions of nw (the aim of nw cooperation, organization, intra-nw division of labor, control, the nature of resource interdependence) Competitive conditions of firms (1 product development, 2 weak competition in new markets, 3 intensified competition, 4 mature markets)	A Primary function nws B Strategic nws: B.1 Learning nws: - Premarket nws - Nws for market fitness B.2 Implementation nws: - Efficiency nws - Command nws	(According to four different competitive conditions) 1 R&D nws 2 Product improvement nws, distribution nws 3 Marketing and production alliances, export pools, purchasing and logistics cooperation 4 Brand production, component design, total deliveries (design + production), corporate services (training, consulting)

Typologies are formed in order to understand differences between networks and, consequently, to design the management to fit each type. Some approaches include an evolutionary aspect by maintaining that each network type corresponds to a certain evolutionary phase of organizing. Miles and Snow (1992) explained failures as stemming from managerial mistakes that violate the operating logic of the organization form adopted. In the same vein, the Finnish researchers Murto-Koivisto and Vesalainen (1995) conceived the cooperation models of their research as equally useful if it is known which factors are enhancing and prohibiting cooperation in each model. They concluded that it is essential to

seek as “pure” a model as possible by operating on conditions of the model in question<sup>26</sup>. Typologies are thus seen simultaneously as ideal types and as real forms to be found in organizational practices.

### Diachronic method: Evolutionary event analysis

Event analysis helps a researcher to focus on crucial phenomena and phases in the history of the observed activity. The concept of event has been taken up by multiple theoretical approaches, each of which carries different philosophical and methodological implications. In the following, I will discuss four aspects of an event. First, events are *meaning-events* (Foucault, 1977). Second, events are *intermediate* and *embedded* analytical tools (Peterson 1998). Third, events are *critical* (March et al., 1991). The fourth aspect, not elaborated in the existing studies, is that events are *object-oriented*.

1. *Meaning-event*. Foucault (1977) criticized the self-centered phenomenological conceptualization that places the event before or beside meaning, an event seen as “the rock of facticity, the mute inertia of occurrences (...) submitted (...) to the active processes of meaning, to its digging and elaboration” (ibid., p. 175). Events and their meanings are inseparable and neutral, in a sense that a signification based on the individual subject is not pursued. Foucault wanted to emphasize the metaphysical basis of a meaning-event by showing how events have a life of their own detached from the physical facts, which initially “caused” them. Foucault draws from great historical dramas with events like “Marc Antony is dead,” which might not be quite proportional to the local events, such as “The Club is founded.” I take a somewhat more moderate stance than Foucault. Events ensue from the accounts and contexts given by the participating actors. They are multi-perspective constructions, mediated and filtered through participants’ collective memory and signification, accompanied by a researcher’s interpretations.

2. *Embedded and intermediate events*. Events offer an intermediate tool for analyzing the history of collective activity. I shall be cautious to fix it as the methodological unit of analysis. Peterson (1998, p. 16) called events nicely “the units of process.” An event seems to be simultaneously loose enough and specific enough to open up a potential for analytical units of different qualities. Peterson pointed out that “real, concrete events resist reduction to either a strictly

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<sup>26</sup> “...kaikki edellä esille tuodut yhteistyömallit voivat olla omalla tasollaan hyödyllisiä, mikäli tiedetään, mitkä tekijät ovat mallikohtaisesti olennaisia yhteistyötä edistäviä ja mitkä sitä haittaavia tekijöitä; olennaista on siis se, että tavoitellaan mahdollisimman ‘puhdasta’ mallia toimimalla juuri ko. mallin ehdoilla” (Murto-Koivisto & Vesalainen 1995, p. 75).



psychological or a strictly sociological viewpoint” (ibid., p. 30), events being actually cross-level, intermediate phenomena. This notion is in accordance with the discussion (*who* are the learners) carried out in Chapter 2. An event allows one to use the label “social actor” to designate an individual, group, organization, or other social entity.

When so designated, a social actor can be treated as a subject that interprets events treated as objects. Unlike events, social actors are focal points around which the processes of taking action and giving meanings occur. Their continuity allows them to be appropriately distinguished according to structural level of analysis (Peterson, 1998, p. 17).

The claim on the subjects’ continuity is to some degree contradictory to the notion of cross-level events involving multi-level social actors. An alternative approach to provide continuity from one event to another is suggested in point four below.

Events are always embedded in a context. Social actors can give events meaning by linking them to *potential futures*, according to Peterson (1998)<sup>27</sup>. The ability of embedding events within alternative potential futures involves learning seen as a process whereby (an organization’s) “expectations about the future potentials of a present event-field can change” (ibid., p. 21).

3. *Critical events*. It can be first assumed that any kind of event bears a change, in other words, we identify events on the basis of the change it brings to previous circumstances. But what makes an event critical? March, Sproull and Tamuz (1991) suggested three criteria, which are relevant from the learning point of view adopted here. They are an event’s *place in the course of history*, its *place in the development of belief* and its *metaphorical power*. First, events that change the world are critical, such as major technological innovations (for example, the printing press). “From such an incident, one learns about changed implications for the future rather than about how to predict or control similar occurrences in the future” (March, Sproull & Tamuz, 1991, p. 3). Second, events that change what is believed about the world are critical, involving a surprise that provides an unexpected contradiction to our beliefs. This becomes obvious in accidents and crisis situations, which force the actors to learn through a thorough examination of what happened, what had not been taken into account, and what are the significant features and their implications for the future<sup>28</sup>. Third, events hav-

<sup>27</sup> The very quality of multiple potential futures separates social analysis (of events) from physical analysis, Peterson (1998, p. 21) claims.

<sup>28</sup> A “cosmology episode” (Weick, 2001) refers to implausible events of a similar type. “A cosmology episode occurs when people suddenly and deeply feel that the universe is no longer rational, orderly system. What makes such an episode so shattering is that both the sense of what is occurring and the means to rebuild that sense collapse together” (ibid., p. 105).

ing metaphorical power are critical by evoking meaning, interest and attention for organizational participants. These are often channeled through storytelling, endowing experience with metaphorical force. Some historical events are better vehicles for meaning than others, March, Sproull and Tamuz (1991) point out.

In sum, the first three criteria for identifying evolutionary events are that they bear meaning, they are intermediate and embedded, and they are critical. However, these criteria define events mainly as single units to be analyzed, not assuming a series of subsequent historical events, which together build up a developmental trajectory of the phenomenon studied. Peterson's suggestion to take the social actors, the subjects, as the focal points of events does not assure continuation in a networked multi-level context. In this study, the events will be framed by means of object construction, as discussed in Chapter 2.

4. *Object-oriented events.* The fact that the actors join networks in order to achieve or produce something together is so obvious that it sounds like a truism. Maybe for this reason its analytical potential has been overlooked in event literature. Here this "something" is taken as one of the guiding principles of the analysis. Emerging objects, being the motivating force of collaboration, can be followed through the subsequent events. By following the changing object of collaboration, it is possible to identify and analytically discern one event from another, as well as frame the entire trajectory to be analyzed.

The research task is to study the emerging object in the contexts of the activities of the *Club*, collaboratively created during the early years of the network. The object to be constructed was twofold: On one hand, the Club itself as an organizational innovation, and, on the other hand, the collaborative projects to be pursued through the Club.

Clearly, the succession of events does not provide us with a coherent image of the history and future potentials of the activity analyzed. An outlining of longer periods of time is needed. Events, in turn, are a meaning-giving core, a culmination, of each historical phase. A meaningful event involves a particular turning point or milestone of collective activity, noticed by participants as well as by the researcher. *An event is relational, telling about the incident as well as the phase it is embedded in. In this analysis, the double concept event/phase will stand for this relation.*

#### Dialectical method: Analysis of developmental contradictions

Typologies and events provide tools for studying networks. The analysis of developmental contradictions and corresponding learning actions or epistemic actions (Y. Engeström, 1999) further enriches the picture. The tools for a dialecti-

cal approach were presented in Section 2.4. By analyzing historical events/phases in the framework of the cycle of expansive learning, we may hypothesize on the future learning challenges of the Club in terms of its zone of proximal development.

## Data

The selection of relevant historical material is especially demanding in network analysis, where the relevant activities and events are multifarious and scattered both spatially and temporally. Studying the relatively short history of the Club made it easier for me to capture and sort out meaningful data. On the other hand, studying a novel activity, in the process of its making, complicated the observations. The three main sources of data are *interviews* with the key actors of the founding process, *participant observations* including the member meetings, the coordinator's work, and the visits to the firms, and *archives* of the Club (Table 5.2).

**Table 5.2** Data of the analysis of the Club

Source of data	Contents of data	Time
1 Interviews	Interviews with 15 key actors of the founding process of the Club: - 11 firm managers - 4 academic and administration representatives	Turn of 1995 and 1996
2 Participant observation	Tape-recorded meeting discussions: - 4 member meetings, 2 days each - Coordinator's work - Visits to two member firms	November 1995 – November 1996
3 Archives	Written documents filed by the Club: - Meeting protocols and memos - Strategy plans and annual reports - Plans, schemes and drafts of action - Correspondence of Coordinator: intra-Club, consultants, officials - Articles in professional magazines 1993 – 1996	1993 – 1996

### 5.3 Results of network typology analysis

What kind of network is the Club in light of the network typologies presented in Table 5.1? The Club is an exchange network containing trading links as well as a communication network with non-trading links (Szarka, 1990). It represents both limited cooperation and broad, production-based cooperation (Alter & Hage, 1993). The nature of the Club governance is bilateral, based on mutual adjustment and alliance (Park, 1996). Moreover, the notion of small firm networks has relevance for the Club, although the historical origins differ from those presented by Perrow (1992).

Grandori and Soda (1995) have difficulties in placing subcontracting in the frame of their classification into social, bureaucratic and proprietary networks: “Actually, some forms of sub-contracting should be attributed more to social networks and others to bureaucratic networking” (ibid., p. 201). They address vertical, asymmetric subcontracting relations between a central firm (the main contractor) and subcontractors. Although this relationship is of vital importance for subcontracting firms, I will here concentrate on network types illustrating historically more recently-emerged horizontal collaboration.

In sum, despite the variety of general categories and criteria, the Club does not unambiguously fit any of them but becomes understandable by combining qualities of various network types. Let us first examine the Club from three different perspectives by comparing it with *strategic alliances*, *joint ventures* and *small firm networks*.

#### Strategic alliances

Håkansson and Sharma (1996) locate strategic alliances beyond the normal buyer-seller relationships, as well as beyond full acquisitions and mergers. “The term *strategic* indicates that the alliances are formed to improve the future position of the firms. Alliances that concern either the present or immediate future are not seen as strategic. Strategic alliances should have very clear and pre-specified long-term goals or ends” (ibid., p. 109). Furthermore, they list several reasons for firms to enter into strategic alliances: to acquire skills, to purchase, to get access to critical external resources, to get benefits from another organization without owning it, to reduce risks, or to adapt to rapid technical changes in an industry.

Håkansson and Sharma (1996) take a critical stand on this kind of instrumental-rational perspective, which they call a market view, and present a network view as an alternative approach. Indeed, from the network perspective, stra-

tegic alliances appear to be open-ended, embedded as they are in other processes in firms. “What can be achieved is more related to what is happening during the process than to predetermined goals or ambitions” (ibid., p. 117). Outcomes can be unexpected, difficult to identify, and they can appear in a number of different dimensions. As the writers point out, the ideal of an open-ended strategic alliance is still a minority view among researchers. Generally the outcomes of strategic alliances are measured in terms of success and failure in achieving the prespecified goals of the alliance partners. In addition, there might appear something that is classified as “unexpected” or “other outcomes”, mostly nonmaterial and social issues connected with economic affairs.

Judging from the cases presented in the literature, a majority of strategic alliances are formed between big companies, or, as in commercial biotechnology, between small dedicated firms and large diversified corporations (Barley, Freeman & Hybels, 1992). Literature seems to lack cases where strategic alliances would concern small and medium-sized enterprises or subcontracting companies, which omits the innovative practices of a large business area dominating in countries like Finland.

The concept of strategic alliance was central in the “academic” formulations of the Club. Being strategic referred to the future goals as opposed to short-term operative cartels. In a group, members would gradually build mutual trust and combine different perspectives of individual firms. Simultaneously, there were much more specific and ambitious business aims. Thus, the Club had elements of both an open-ended strategic alliance and an instrumental-rational one.

### Joint venture

Joint ventures and strategic alliances are often used synonymously or without conceptual distinction: “Joint ventures and strategic alliances are bilateral relationships with formal controls or informal cooperative agreements” (Alter & Hage, 1993, p. 6). I define a joint venture as a specific type of strategic alliance, which takes a step forward in formalism. Joint ventures are founded on proprietary commitments (Grandori & Soda, 1995). In addition, they are symmetric type of alliances, in the sense that there is no central coordinating firm and the coalition power of the partners needs to be balanced. Grandori and Soda sum up the definitions in economic and managerial literature.

In fact, in the definition of a joint venture, it is usually assumed that two or more mother firms, in order to conduct joint activities, jointly create, own and manage a third enterprise, thereby needing to use the

full range of coordinating mechanisms from effective communication, joint decision-making and negotiation processes to well balanced capital commitments (Grandori & Soda, 1995, p. 204).

As pointed out above, a joint venture type of network has relevance for the Club. The first projects of the Club were mainly directed at its own product development and manufacturing, and one joint venture was founded around a technical innovation. The initial goal of the Club was to offer products of high technology for global markets, either through its own product development or as system supplying for a big customer firm. This was to be reached through a joint venture type organization. One of the academic initiators described this dual role of the Club:

The most important task for the Club as an association in 1993, is to function as a discussion forum. The business goal, and simultaneously the main goal for 1993, is to start the creation of the Club-portfolio (The Club-Invest). The aim is to find at least one product with principally global markets, around which a new company will be formed, as mentioned above. In prospects of the summer of 1993, this goal will be reached (*Liiketaloustieteellinen tutkimuslaitos*, 1993, p. 44; translation HT).

### Small firm networks

Perrow (1992) describes small firm networks (SFNs):

The firms are usually very small - say 10 people. They interact with one another, sharing information, equipment, personnel, and orders, even as they compete with one another. They are supplied by a smaller number of business service firms (business surveys, technical training, personnel administration, transport, research and development, etc.) and financial service firms. There are, of course, suppliers of equipment, energy, consumables, and so on, as well as raw material suppliers. Finally, while producers may do their own marketing and distribution, it is more common for there to be a fair number of quite small distributors, which is especially striking because SFNs typically export most of their output (Perrow, 1992, p. 445).

Perrow (1992) addresses here regional networks, of which we have empirical evidence from, for example, Northern Italy and Japan. However, when look-

ing at horizontal networks of small, equal, and possibly competing firms as a historically-emerging form of economic organization, it is not reasonable to limit the analysis to local relations only. Industrial districts are but one type of small firm networks, presumably a historically early form that has gained a lot of publicity not least because they are more visible than distributed networks and have significance in regional politics<sup>29</sup>.

Thus, SFNs can also be composed of nonregional sectoral and cross-sectoral networks of companies. The Club would belong to this category. The Club differs from Perrow's description with regard to the size of member companies that varies from about ten to one hundred workers. On the other hand, many features of SFNs are found in the Club. It is a combination of relatively independent companies, seeking to gain synergy and economies of scale through collaboration. At the production level of collaboration, the idea is to avoid the bureaucracy of formal contracts and power and hierarchy relationships usually involved in them. It seems that this kind of activity was increasing among the member companies after a few years of collaboration within the Club.

In sum, the Club seems to be a hybrid form of network (Table 5.3). It is not a strategic alliance, nor a joint venture or a small firm network, but it has features of them all. Asking how the Club fits into the existing typologies can be turned the other way round by asking how the typologies fit the Club. The emergence of network types and their meaning to the Club activity is analyzed next historically.

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<sup>29</sup> In their typology, Alter and Hage (1993, p. 48) do not even include ecological distance as a dimension. It is more useful to note the number of cooperating organizations in a single sector or across sectors. Szarka (1990) points out that, although networking and regional concentration of sectorally-related small firms seem to go together, these two are in no way synonymous. First, he claims, "a significant network will ramify well beyond a single geographic area" (*ibid.*, p. 17). Second, "a company's siting within a geographic/sectoral cluster is neither a necessary nor even a sufficient condition for the formation of sustaining networks" (*ibid.*, p. 17). Miettinen (2002, pp. 88-106) discusses the regional dimension of innovation systems and networks and points out that in a small country like Finland, relevant knowledge and expertise are sought where they can be found, that is, across regions.

**Table 5.3** Typological features of the Club

<b>Network type</b>
<p><b>Strategic alliance</b></p> <p>Academic idea of the Club:</p> <p>a) Making products for global markets - instrumental-rational view</p> <p>b) Developing trust and subcontracting culture - open-ended network view</p>
<p><b>Joint venture</b></p> <p>The first major project of the Club: Jointly created third enterprise to commercialize a technical innovation and to manage the design, production and marketing of the new product</p>
<p><b>Small firm network</b></p> <p>Collaboration becoming general over time within the Club: Informal nonhierarchical interaction and trust-based exchange between equal member firms</p> <p>Customer-oriented projects between 2 – 3 member companies</p>

## 5.4 Results of event/phase analysis

The early history of the Club can be grasped through three main events/phases reflecting the experiences of the participants, as discussed in Section 5.2. They are: 1) The founding process of the Club network in 1991-1993, 2) Searching for the object of and model for the Club activity in 1993-1994, and 3) Accepting the heterogeneity of the Club in 1995-1996. The years proposed for each phase are approximate. In reality, the phases are partly overlapping.

Events are object-oriented, as pointed out earlier, which means that an event is analytically separated from other events by examining the changing object of collaboration. The interview with Manager A (Chapter 3), who was involved in the process from the beginning, may here represent the perspective of the members. As far as I could observe, the managers were quite unanimous about the main events and phases of the Club. When contradictory perspectives emerge they are reported and analyzed below.

### Event/phase 1: The founding process of the Club (1991-1993)

The idea of founding a special “club” in the metal and electronic industries was first presented in academic circles by a professor of economics who was experienced in interfirm cooperation in other industrial sectors, such as the Scandinavian furniture industry. The initiator considered the prerequisites for cooperation to be good in metal subcontracting, where he saw the range of technol-



ogies to allow less direct competition than, for example, in the furniture industry. In 1991, he contacted the management of the Federation of Finnish Metal, Engineering and Electrotechnical Industries (FIMET) and presented his ideas.

Through the FIMET, it was possible to reach some frontline subcontracting companies whose CEOs already participated in member activities of the FIMET and were interested in the development of subcontracting policies. These CEOs were representatives of the subcontractors' branch group at the Federation. Even though the initiative came from outside the firms, which had implications for the early phases, it is important to acknowledge the active contribution of the key managers from the very beginning. One of them was Manager A, presented in Chapter 3.

*Excerpt 5.1*

It became a kind of rehearsal for the club-activity and cooperation, during which members from the subcontracting working group were invited to participate. The invitation was sent to all, perhaps less than thirty firms gathered together to discuss the issue and how to proceed. We did not at once warm to [Professor's] club-idea. Its main aim was probably to gather managing directors in club-type events, in which we could discuss and put forth ideas, get to know each other better and learn to trust each other, from which cooperation would gradually ensue. (Manager A, 1/96)

The initial idea of a club was twofold: on one hand, to offer a forum for developing collaborative practices in the Finnish metal subcontracting and, on the other hand, to promote ambitious global business affairs between the member companies. The following parties were involved in the founding process of a new network, which concurred actively in bringing this new network about: two scholars from the Helsinki School of Economics, the Federation of Finnish Metal, Engineering and Electrotechnical Industries (FIMET), managers of some metal companies (active members of the subcontractors' branch group in FIMET), and the Ministry of Trade and Industry.

Participants mentioned, particularly, two features as characteristic to this event: First, that the foundation of the Club was preceded by a *long planning process* with several negotiations. Secondly, surrendering oneself to the project was pushed by *the economic depression* that had quieted business issues at the turn of the decade and forced the managers to think about the long-term strategies.

The long planning process was needed above all to articulate the idea of the group and, in that way, convince the firms of its benefits. A series of seminars and minor negotiations were organized, directed at the subcontracting companies of the FIMET membership. Forty or fifty firms were contacted through

FIMET, about thirty managers were present in the negotiations, of which fifteen became finally founding members and joined the Club.

What were the motives leading to the foundation of the Club? When I asked the members and other initiators this about three years later, I was provided with a wide range of answers. These can be roughly divided into two categories, which are “non-business” and business. Table 5.4 shows all articulations of the various motives given by eleven managers and four representatives of the administration (academics and FIMET).

The motives mentioned in the interview situation include a heterogeneous combination of open-ended expectations and more determined business plans. From bare numbers it can be seen that the business and non-business motives were equally mentioned by the managers whereas the business motives were obviously prioritized by other initiators of the Club.

**Table 5.4** The motives for founding and joining the Club network in 1991 - 1993, drawn from the interviews of eleven managers and four representatives of the administration in 1996 (numbers of motives mentioned by the interviewees)

<b>The motive of founding and joining<sup>30</sup> the Club</b>	<b>Firms</b>	<b>Administration</b>
<b>1 NON-BUSINESS:</b>		
Club as the forum of free discussion and psychological support of colleagues	3	1
+ Network experiment, new subcontracting culture and collaboration	5	2
+ Learning from others, benchmarking, training and development	4	2
<b>TOTAL</b>	<b>12</b>	<b>5</b>
<b>2 BUSINESS:</b>		
Club as the forum of business collaboration	2	4
+ Security against economic depression	4	2
+ New business contacts for firm	2	-
+ Strategic alliance of the subcontracting metal industry	-	3
+ System supplying for a big customer	2	4
+ Joint products from innovations to marketing	2	1
<b>TOTAL</b>	<b>12</b>	<b>14</b>

<sup>30</sup> Only firms could join the Club, not the representatives of the administration.

What cannot be read directly from the table is the fact that the initiators, “pioneering managers,” evidently differed from each other in the degree they preferred either the network-ideological and experimental nature of the network or immediate economic profits gained through collaboration. Some of the members interviewed expressed even more open-ended attitudes by claiming that they did not expect anything special when they joined the club. They simply joined out of curiosity, feeling that “this was something.” This was typical for the “recruited managers” who joined the Club at the end of the founding process or shortly after that. In sum, both open, process-like views, and instrumental-rational views on the Club were presented (Håkansson & Sharma, 1996).

Besides the overall interest in networking and network economies, there was another, more acute reason driving firms to seek for new ways of collaboration: the economic depression that in Finland reached its deepest point in 1991. For many small and medium-sized firms it was a question of survival to find new partners and product ideas for their business activity, as was discussed in Chapter 3. Manager D phrased this motive very clearly:

*Excerpt 5.2*

I must say that the starting point was most favorable, in that everybody was under great pressure because of the depression. So that, in fact, and I know that others have claimed the same, had the situation been what it is now, nobody would have had time for these kinds of issues. So there was really a great demand for this kind of topic at that time.  
(Manager D 1/96)

Although the economic depression affected Finnish companies very strongly at the time the Club was founded, only one third of the managers mentioned it as a motive for joining the Club (Table 5.4). Forgetting the effects of the problematic economic situation may have many reasons, not least the troublesome experiences and memories. A more plausible interpretation is that the initial need state caused by the recession changed during the first years of the Club activity. The urgent economic problems no longer motivated the members to participate, but new motives had evolved instead.

The negotiations led to the formation of a Club at the beginning of 1993, but it was soon realized that a loose club was not fit for dealing with the issues collaboration brought with it. Manager A explained how the idea of a discussion club was finally put in the form of an association, which was the central event of this phase:

*Excerpt 5.3*

We ended up with a decision to found a kind of club and everybody had to announce whether they would join or not. Fifteen firms joined it. And then we took another cruise where we put forth ideas for the activities of the club. We had already some product cases to be discussed (//). One of them resulted in the foundation of a separate company, [Project name], owned by a total of ten firms. (//)

Very soon we noticed that this would not work as a mere club. The organization required monetary procedures, and the initial aim was to have the FIMET only as a start-up supporter and initiator, withdrawing from the activity later on. So we decided in the spring to organize this in the form of an [registered] association. (Manager A 1/96)

The leadership of the newly founded Club was, from the very beginning, in the hands of the managers, even though the outside interest and support had been strong and continued to be so during the early years of the activity<sup>31</sup>. The activity was meant to be financed by the member firms. Nevertheless, the contribution of the background organizations was significant, for example, in hiring the first coordinator to run the operations of the Club. FIMET's supportive role was continually important, as it had been during the planning process. The Ministry of Trade and Industry gave financial support to the first projects of the Club. The academic initiators gave a strong impetus for the first formulations of the Club activity, influenced by European network examples (Eräheimo & Lahti 1993)<sup>32</sup>.

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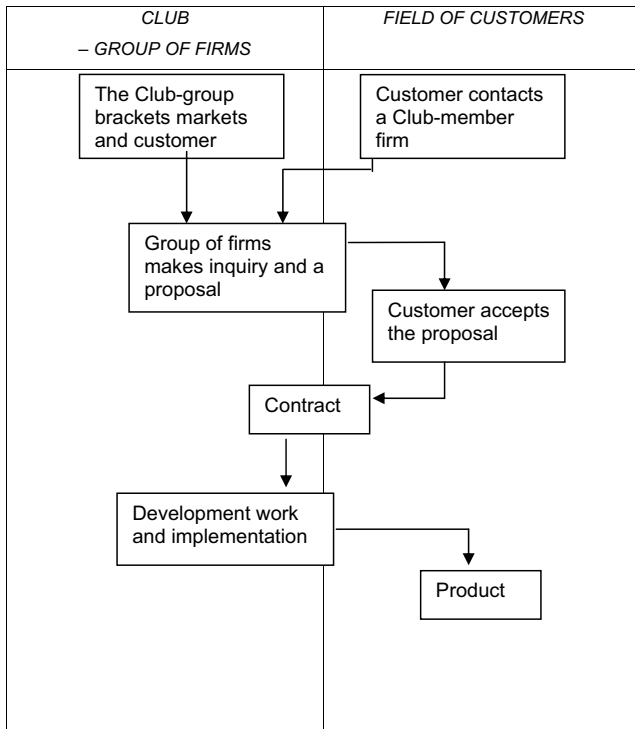
<sup>31</sup> Situation was different from what, for instance, Huggins (2000) reports concerning inter-firm network formation by public policy intervention. Barriers to local development were, among other things, that the policy-making agencies tended to rely heavily on central government funding, and the firms targeted lacked awareness and perception of the benefits of networking (*ibid.*, p. 10).

<sup>32</sup> The lack of network models in Finland during that time has been retrospectively noticed by other researchers. Paradoxically, it has been emphasized that the developer should have a clear image of what kind of collaboration is being sought after. This view undermines the creative aspect of the network construction. Referring to this pioneering phase, the researchers comment slightly ironically: "When cooperation and networks among SMFs became a topic of public discussion in Finland at the beginning of the 1990s, the promoters of cooperation had at their disposal only an idea of an 'Italian model' as some kind of vertical model of cooperation, and a 'Danish model' as a horizontal model of cooperation, accompanied with an over-emphasis on a formal joint venture to be established" (Murto-Koivisto & Vesalainen, 1995, pp. 70, 72; translation HT).

Event/phase 2: Searching for the object of and model for the Club activity (1993-1994)

Once the new association was founded, the actors were eager “to show proof” of its effectiveness and, as was pointed out, to gain profit from collaboration. The work of the coordinator of the Club consisted mainly of assessing product ideas - fifteen altogether - which came to the Club partly through member companies, partly from innovators outside. The idea was to establish a separate company, the “Club-invest,” for the business activities of the Club, in order to sustain the non-profit nature of the Club itself.

Figure 5.1 shows an attempt to model the procedure of getting into business with the Club, designed by the first coordinator in collaboration with other participants. The model was in the first place meant to inform potential customers and other parties about how to contact the Club and how the network would function in the production process. Two main ways of receiving product development cases were sketched: either through an active search by the Club itself or through customer contacts mediated by member firms.



**Figure 5.1** A draft for a model “How does the Club work?” (The Club archives, 1993)

One of the product development ideas was realized as a Club-project. A jointly-owned company was established, becoming the major event of this phase of the history. The company aimed at the commercial launch and production of a certain metal machine-tooling technology. The project was not successful and the company that had introduced the innovation withdrew from the Club cooperation and membership. Nevertheless, the actors often mentioned this project as a useful learning experience. The interpretations of the lessons from the project were diverse and contradictory. Many managers saw it as an inevitable experimentation in the Club's early history, helping the participants to focus on the future activity and to articulate the conditions of membership. The outside initiators, especially one who was actively taking part in the project, saw that the Club had hence failed to reach one of its main goals.

**Table 5.5** Diverse explanations by the members of the Club on the causes of failure of the first major project

1. Failure in recruiting competent people as project coordinators, lack of experience in interfirm business management.
2. Lack of open communication and knowledge sharing from the innovator who presented the idea for the Club. This partner finally was not interested in developing the Club as a joint venture, and withdrew from collaboration.
3. The technological/mechanical solution did not fit the know-how area of the member companies.
4. Lack of a model for the project management in general. Many strong individual managers working together without properly-defined operative responsibilities.
5. Problems in the product development work. Subcontracting companies are by definition specialized in the production process, not in innovation and design.
6. The reasons for failure were the same as in business in general. The product and the business idea did not prove to be developable under these conditions. But the group made it possible to invest in the preliminary study of the business idea, which would not have been possible for individual small firms. The risks for further investments were too big. It was not clear how the costs and benefits should be shared among the firms.
7. Many people in the Club were eager in the beginning to make business. They proceeded too fast, before getting to know each other well.

Explanations listed in Table 5.5 concerning the project are known from the literature of failures of innovation networks (Biemans, 1989), and especially joint ventures (Grandori & Soda, 1995). Actor-network theory might well describe this process as a failed effort to construct a proper network around a new technological artifact (Law & Callon, 1992). One of the early notions of actor-network theory was that of “translation,” which emphasizes the strategies adopted by the fact-builders to enlist and interest the human and non-human actors needed for the success of a project (Latour, 1987). In the case of the Club, however, the network was not formed around the technology project, but, on the contrary, the project was to serve the creation of the overall practices for the network. From the very beginning, the Club was aimed at crossing the traditional boundaries of subcontracting activity. Experiences gained from the joint venture made these boundaries visible and shaped the learning challenges.

In this section, I have described an event/phase that took place in the early history of the Club. It reveals the first attempts by the participants to model their joint activity. This phase may be seen as a collective effort at constructing the object and the model of activity. The unsuccessful project helped the members to clarify the rules and the division of labor of the activity of the Club, but these were not easily represented in flow charts. For example, it showed that success in a joint enterprise requires one of the companies to take the main responsibility of the product development and project management. Other member firms could join the project if it fit their technology and know-how area. Partners could also be chosen partly or totally from outside the Club, according to normal business procedures. This event/phase made it clear for the members that it was not possible to find a product area combining the technologies of all member firms.

The idea of a big business project was not abandoned. Critical discussion on the philosophy and model of the Club continued among the members during their meetings, and the issue of The Club Project was a subject of hot debates. The theme of the year 1994 was named “system supplying,” including the idea of introducing the network concept to big customers. This was actually the start of a series of events evoking new tensions, which are analyzed separately in Chapter 6.

### Event/phase 3: Accepting the heterogeneity of the Club (1995-1996)

The failure in executing one of the basic ideas of the Club did not mean the end of the club. Paradoxically, the unsuccessful showcase contributed to bringing about the model for the Club. Simultaneously, multiple activities were started,

none of which alone stands out as a central event. It seems rather as if the development was dispersed to several trails. In my interpretation, the event was the establishment of the Club as a network and acceptance of the heterogeneity of collaboration, despite the lack of big business projects. Manager A's summary reflects this clearly:

*Excerpt 5.4*

During 1995, I would say that our activity has stabilized in such a way that we have given up the product projects. If such projects have emerged, the firms in question have run them by themselves. Collaborating groups are being formed. It is not controlled centrally by the coordinator. Firms can collaborate even without the coordinator being aware of it. It is all right. Of course it would be good for the coordinator to receive information, but it is not a problem that projects are emerging spontaneously. It is all right, and the association is concentrating more on organizing training seminars, primarily for personnel management. And then we have this quality [training]. (Manager A, 1/96)

The notion of stability is supported by the fact that the Club functioned economically on its own. The members expressed overall commitment to the joint activities without questioning them on any fundamental level.

During 1995, the emphasis of the Club's organizational activity was on training. In addition, a new form of collaboration emerged in a material supply project with a hired fulltime project leader. Eight companies joined this project in order to gain favorable prices in material acquisitions. Both training and material supply expanded the activity of the Club to include personnel groups other than the CEOs of firms. Especially the material supply revealed contradictions in interfirm networking when it met the buyers of individual firms. This type of networking, when introduced from outside the company, aroused suspicions in workers, as they felt it intruded in their task domain. Thus, it is not surprising that from 1995 on, one of the main goals of the Club has been to expand the network activity to cover all levels of the personnel in the companies (see Chapter 8).



**Table 5.6** Pros and cons of the Club activity in 1996 (N = number of answers)

<b>PROS</b>	<b>N</b>	<b>CONS</b>	<b>N</b>
<b>COLLABORATION, TRUST, CONTACTS</b>		<b>COLLABORATION, TRUST, CONTACTS</b>	
- getting to know each other and firms, personal contacts, owner-managers participating	6	- passivity and lack of commitment of members (load on the coordinator, chair and active members); drifting (waiting for what the Club will offer; self-criticism: lack of time, inability to utilize the potentials of the Club	6
- collaboration, contact surface, no mutual competition, no cliques, learning to understand difficulties of collaboration	6	- collaboration between firms (should be developed); lack of synergy; egocentricity (only I will benefit)	3
- openness, trust, good relationships	1	- we still do not know each other's firms well	1
<b>COMMUNICATION</b>		<b>COMMUNICATION</b>	
- forum for social interaction and communication - joint, open discussions and sharing of experience - sharing of knowledge, information, tips, new ideas for the firm	12	Information (should be spread) to all the members; uncommunicativeness; misunderstandings	3
<b>JOINT PROJECTS IN THE CLUB</b>		<b>JOINT PROJECTS IN THE CLUB</b>	
- training	8	- marketing and contacts outwards have not been realized as planned in the beginning	4
- joint projects, joint development projects	2	- lack of big projects which would interest all members; joint big customer projects (system supplying) have not been realized; firms are not ready to carry out big collaborative projects	3
- foreign agency	1	- starting projects is stiff	2
- participation in projects supported by the public sector	1	- small projects should be started, to increase the list of references	1
		- ineffectiveness of the material supply	1
		- material supply does not keep up with the pace of needs of firms	1
<b>BUSINESS, TRADE</b>		<b>BUSINESS</b>	
- subcontracting in production, joint business projects in production; mutual business and trade among the Club-partners	6	- (material) costs of the Club are higher than (material) benefits	2
- business, trade, contracts gained through collaboration	2	- how to show the benefits of the Club to customers?	2
<b>PUBLICITY</b>		<b>PUBLICITY</b>	
- joint exhibition departments	6	- excellence-image should be sharpened	1
- pr-value and the Club as a model for others	2		
- the Club has a good image and authority	1		
<b>THE CLUB AS AN ORGANIZATION</b>		<b>THE CLUB AS AN ORGANIZATION</b>	
- good, active organization	2	- lack of vision, goals must be clarified	3
- active role of the coordinator	1	- expanding the Club-idea to all levels of personnel in firms has not happened	2
- a nice hobby	1	- need for regeneration	1
<b>OTHER ISSUES</b>		<b>COMPOSITION OF MEMBERSHIP</b>	
- development of certain Club-firms in their sector	1	- design is not yet integrated in the Club	1
		- members are not quite homogeneous	1
		- entry, access of new members is difficult	1

Simultaneously with the activities of the Club, numerous business relationships and collaborative production projects emerged between the companies. The number of projects between the Club members increased during 1995-1996, which may be seen as an outcome of advanced Club-activity. These projects were not planned in club meetings but occurred spontaneously among the firms. The result was that members did not necessarily know of each other's projects and did not necessarily have a complete picture of the Club outcomes and achievements. Partly for this reason, members were asked to list "pros and cons" ("*risut ja ruusut*" in Finnish) of the Club activity in the spring meeting 1996. I have gathered them in Table 5.6. It gives an image of how the members dealt with the heterogeneity of the Club activities.

These opinions reflect the historical situation. On the positive side, there was above all good interaction and trust, as well as the symbolic value and status the Club represented. In addition, joint training and mutual business and trade relations between the firms were conceived as good outcomes. Lack of new projects and the passivity of members were generally criticized.

Manager A listed the ongoing projects: training, growing internalization through material supply project, and purchasing office in Lithuania. He concluded in a research interview:

*Excerpt 5.5*

So we have projects going on all the time. But it must not be obligatory to the whole group. Those interested join projects and take care of them. We must accept that everybody is not interested at this moment, but sooner or later they will get interested for some reason. One firm may be approaching the developmental phases that others have passed already. In that situation, we must show a collaborative Club spirit and share the experiences others possess. Why should all of us struggle through the same mud holes learning these issues, why could we not share the knowledge? This is the core issue in the Club activity. At the moment, we are pondering on what new we could find out; there is a kind of quiet phase going on. The training is running on its own, but we don't have anything extra to challenge us. The employment and business situation of the firms always affect these issues. When there is a lack of work and money, people search for collaboration actively. When everything is all right, people are busy running every-day routines, and the activities of the Club quiet down. I think it's natural; you shouldn't fight against it, but rather think that it's okay, we are living this phase now. (Manager A, 1/96)

To summarize, the event analysis engendered three events/phases, which enrich the picture gained through the synchronic analysis. The three network types can now be interpreted as historical layers emerging in the Club's activity (Table 5.7).

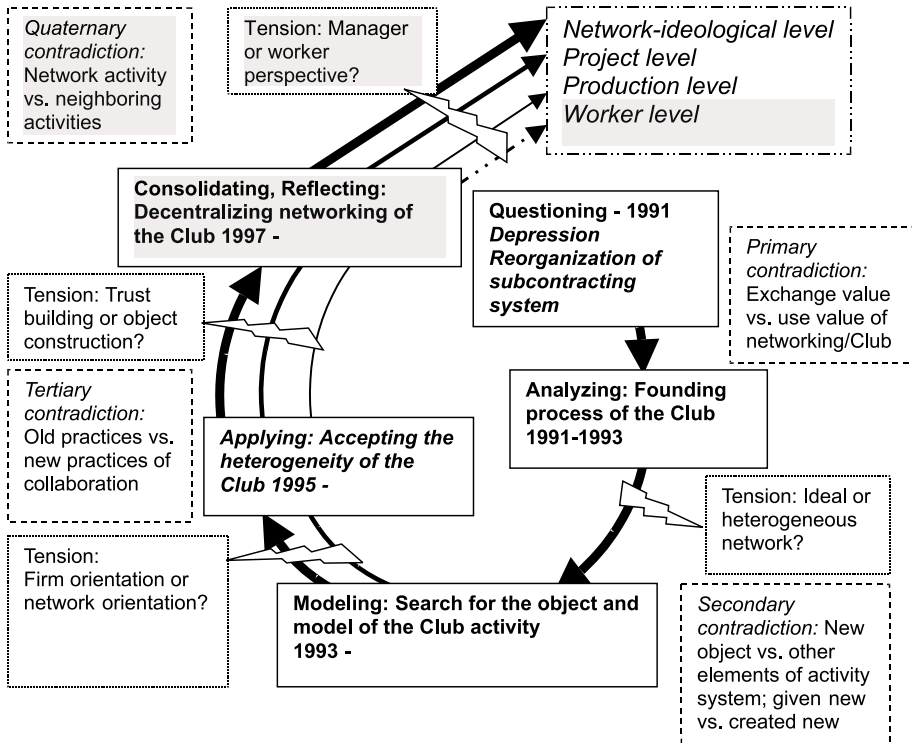
**Table 5.7** The network types and corresponding historical events/phases of the Club

<b>Network type</b>	<b>Event/phase</b>
<p><b>Strategic alliance</b></p> <p>Academic idea of the Club:</p> <p>a) Making products for global markets - instrumental-rational view</p> <p>b) Developing trust and subcontracting culture - open-ended network view</p>	<p><b>The founding process of the Club (1991-1993)</b></p> <p><i>Object:</i> The Club as a dual forum for business and discussion</p> <p><i>Outcome:</i> The Club as an association</p>
<p><b>Joint venture</b></p> <p>The first major project of the Club:</p> <p>Jointly-created third enterprise to commercialize a technical innovation and to manage the design, production and marketing of the new product</p>	<p><b>Searching for the object of and model for the Club activity (1993-1994)</b></p> <p><i>Object:</i> Joint venture - Need for giving proof of the Club's business potential</p> <p><i>Outcome:</i> The Club as a heterogeneous forum for collaboration</p>
<p><b>Small firm network</b></p> <p>Form of collaboration generalizing over time within the Club:</p> <p>Informal nonhierarchical interaction and trust-based exchange between equal member firms</p> <p>Customer-oriented projects between 2–3 member companies</p>	<p><b>Accepting the heterogeneity of the Club (1995-1996)</b></p> <p><i>Object:</i> Multi-level activities within the Club</p>

## 5.5 Results of contradiction analysis

Event/phase analysis displayed the various network types as historical layers, which emerged in the process of constructing the object of the new network organization. The history is further refined by means of an expansive learning cycle (Y. Engeström, 1987; 1999; cf. Figure 2.6), in which the events/phases are in-

terpreted as epistemic actions (Figure 5.2). The model puts forth hypothetical propositions of contradictions that participants were dealing with when constructing collaboration through the events, together with the manifest tensions observed and analyzed in the empirical case studies. Tensions are marked with lightning-shaped arrows in Figure 5.2.



**Figure 5.2** The cycle of expansive learning of the Club 1991-1997: Epistemic actions, contradictions and tensions, zone of proximal development (gray area)

All in all, the cycle model provides a conceptual framework for interpreting the development of the Club as a learning process, creating multi-level activities within the Club. Modeling helps us understand complex processes, but it may also result in rigid interpretations, if taken too formally. While theoretically grounded, the figure may not be graphically the easiest way of capturing the ongoing processes as parallel, partly simultaneous and interwoven. *I want to demonstrate that tensions, problems and failures encountered in networks can be put into the context of underlying developmental contradictions participants work out in collaboration. By showing that each event/phase gave rise to a new level of collabora-*

*tion, it becomes possible to analyze learning and collaboration at each level and across the levels, which opens up perspectives to analyze tensions.*

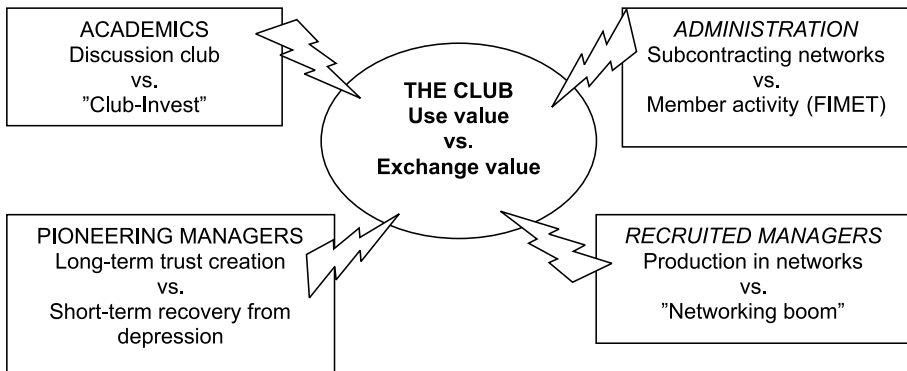
### Questioning 1991

Questioning of the prevailing collaborative practices within the subcontracting firms triggered learning. Two strands of development were prominent at the start of the 1990s, namely the deep economic depression and the reorganizing of the Finnish subcontracting system (see Chapter 3). These were reflections of changes in the global economy and “the rise of networks.” The need state was not articulated by the managers only. The case of the Club shows that there was also an academic interest in networking experiments. This phase gives rise to the primary contradiction. I will examine it in connection with the epistemic action that followed, namely analyzing.

### Analyzing 1991-1993

This corresponds to event/phase 1: The founding process of the Club. The new idea of a “club” within the metal subcontracting sector was presented by the academics. The analyzing phase was directed at the formation of a community of interest (Fischer, 2001) and the articulation of the main purposes of the club at *the network-ideological level of activity*, as I call it. Learning was energized by the primary contradiction between the exchange value and the use value of networking, which appeared to each participant in a slightly different way (Figure 5.3).

I suggest that the contradiction between the use value and the exchange value was interwoven with the discrepancy between the long-term and short-term expectations of the Club. The manifest tension was incorporated into the Club, to be created simultaneously as an ideal type network and as an emerging heterogeneous forum for collaboration. In this phase, the Club, as a novel network organization, was the object of collaboration, whereas, in the phases to come, the Club began to formulate the object of its own at multiple levels of activity.



**Figure 5.3** The primary contradiction in founding phase of the Club

### Modeling 1993-1994

This addresses event/phase 2: Searching for the object and model for the Club activity. In the modeling phase, the joint venture was used to construct the object of the new network and other elements of the emerging activity system of the Club. “The model is that of a *given new* activity, but it contains a latent inner contradiction which will give rise to actions anticipating the *created new* activity” (Engeström, 1987, p. 189). I interpret the joint venture experimentation as the given new reflecting partly the academic idea of a subcontracting network, with quite ambitious business goals, and partly stemming from the managers’ eagerness to proceed quickly to business.

The outcome of this phase was the created new model, giving rise to *the project level* of the Club. As the event analysis showed, the model comprised of a heterogeneous combination of activities, proceeding from the initial network ideals towards the actual collaborative potentials of the Club. The problems of the joint venture show that this shift did not happen without tensions. It can be seen as a struggle for the ownership of the Club projects between the outsiders and the members, ending in favor of the latter. Nevertheless, the discussion around big business projects continued. This generated a tension within the Club between the interests of a single firm and the interests of the entire network, which is analyzed in detail in Chapter 6.

### Applying 1995-1996

Application of a new model represents finally the birth of a new activity. People who carry out new actions face two kinds of disturbances: those stemming from

the resistance of the old activity, and those caused by the created new activity that transcends the limits of the given new. In this case, I interpret that the Club-collaboration among the member firms raised resistance within the firms (old activity), as well as within the Club (given new versus created new). Event/phase 3: Accepting the heterogeneity of collaboration, represents this phase, including the notion of the stabilization of the Club as a network organization.

The application phase opened up a new level of activity that I call *the production level*. To understand this phase, it is necessary to go deeper into the activities of the firms than what was possible in the preceding general history of the Club. This is done in Chapter 7. The emergent tension reflecting the contradiction between the old and the new was observable in the way the collaborating parties constructed simultaneously both trust and the object in a speedy production project.

#### Consolidating, reflecting 1997-

Characteristic for this phase are attempts to decentralize the new activity and to create a social infrastructure for it (Engeström, 1987, p. 190). Evidently, the need for expanding the Club activities to personnel groups other than managers, and rooting the infrastructure within the firms, reflected this phase.

Consolidation and critical reflection of the new activity brought about new kinds of contradictions, emerging primarily between the new Club activity, and its neighbor activities, both within the member firms and customer companies<sup>33</sup>. The manifest tension derived from imposing the management perspective on networking, which confronted the perspectives of the workers at different positions of the production organization. This pointed to a new emerging level of activity, *the worker level*, and anticipated the start of a new cycle of expansive learning.

The consolidation phase was not included in the analysis reported in this chapter. I interpret it as an anticipatory element of the zone of proximal development of the Club in 1997. A new type of collaboration in the form of partnerships emerged among the firms of the Club<sup>34</sup>. They were a kind of subnetworks within the Club, concentrating on long-standing business issues such as product development, organization development, and production, which were not in the focus of the Club as an association. Being situated in the zone of prox-

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<sup>33</sup> Tensions in regard to customers are touched on in Chapter 6, where the project level analysis reaches historically from the modeling phase up to the consolidation phase.

<sup>34</sup> Examples of partnerships are given in Chapters 6 and 8. See also Manager A's account in Chapter 3.

imal development, the learning challenges of the worker level of networking showed up as a hypothesis to be tested. This was done through a research intervention called the “Developmental Dialogue,” an event I could personally contribute to (Chapter 8).

To summarize the three approaches analyzed, the contradictions engendered by the epistemic actions may be juxtaposed with the events/phases and the typological features of the Club (Table 5.8).

**Table 5.8** Network types, events/phases, and contradictions of the Club

<b>Network type</b>	<b>Historical event/phase</b>	<b>Contradiction</b>
Strategic alliance Academic idea of the Club: a) Making products for global markets - instrumental-rational view b) Developing trust and subcontracting culture - open-ended network view	The founding process of the Club (1991-1993) <i>Object:</i> The Club as a dual forum for global business and discussion <i>Outcome:</i> The Club as an association	Exchange value vs. use value of the Club <i>Epistemic actions:</i> Questioning and Analyzing <i>Tension:</i> Ideal or heterogeneous network?
Joint venture The first major project of the Club: Jointly created third enterprise to commercialize a technical innovation and to manage the design, production and marketing of the new product	Searching for the object of and model for the Club activity (1993-1994) <i>Object:</i> Business network - Need for giving proof of the Club's business potential <i>Outcome:</i> The Club as a heterogeneous forum for collaboration	Given new activity vs. created new activity of the Club <i>Epistemic action:</i> Modeling <i>Tension:</i> Firm's interests or network's interests?
Small firm network Form of collaboration generalizing over time within the Club: Informal nonhierarchical interaction and trust-based exchange between equal member firms Customer-oriented projects between 2–3 member companies	Accepting the heterogeneity of the Club (1995-1996) <i>Object:</i> Multi-level activities within the Club	Old cooperative practices vs. new networking practices <i>Epistemic action:</i> Applying <i>Tension:</i> Construction of trust or construction of object?
<b>ZONE OF PROXIMAL DEVELOPMENT</b>		
Partnership networks Long-standing bilateral development and production interaction	Decentralizing networking in and between the firms of the Club (1997-) <i>Object:</i> Business-oriented subnetworks or partnerships	New network vs. neighboring activities <i>Epistemic action:</i> Consolidating <i>Tension:</i> Manager perspective or worker perspective?



## 5.6 Conclusion

The aim of this chapter was to analyze the history and the future learning challenges of the *Club* network. The research question was: *What does network evolution tell about learning when interpreted through developmental contradictions and expansive learning?* I applied three different modes of explanation - synchronic, diachronic and dialectical - on network dynamics and learning. The potentials of each of them may now be converted into a question and summarized before going to the main question that is conducive to the analytical framework of this study.

*What are the potentials of structural typologies for conceptualizing an interfirm network and its learning challenges? (Synchronic explanation)*

Network types and typologies are ideal representations of networks. Their use in categorizing a real network, the *Club*, was problematic. Instead of imposing pure types on network cases, typologies offered a heuristic tool for zooming in on the network from different perspectives. The *Club* appeared as a hybrid between a strategic alliance, a joint venture, and a small-firm network.

The examination of the network categorizations helped me realize the increasing complexity and heterogeneity of the *Club* network. However, a synchronic explanation did not allow for assessing how these types were related to each other and what their meaning was for the present and future activity of the *Club*. How did heterogeneity affect learning and vice versa? Learning, in this framework, is one feature, among others, of a network; some network types are better fit for learning than other types.

*What are the potentials of the analysis of historical events/phases for understanding the dynamics of a network and its learning challenges? (Diachronic explanation)*

Events are evolutionary, object-oriented units shaping and reshaping collaboration. They should not be understood merely as illustrative points in history, which was emphasized by introducing the concept of event/phase. Through the events, a network continuously defines itself, creates meanings and articulates what it wants to become. This happens, above all, by means of collaborative object construction and production of outcomes for a network. Three events/phases revealed the heterogeneity of the object construction. The “typology of the *Club*” could be interpreted as a composition of historical layers of activity, producing multiple objects. These objects were co-existent and continuously transforming, which caused tensions in collaboration.

Events/phases are generally assessed on the basis of their outcomes. This has resulted in idealized models concerning the conditions for success and failure of a network. The multi-level approach showed, however, that a single failure could contribute positively to learning when embedded in the heterogeneous

activity and interpreted in that context. Idealization is pursued not only by researchers but also by the participants themselves. Those failing to observe the broader context were inclined to criticize the Club for the lack of results referring to the unsuccessful business project. The outcomes detached from the context can easily blind participants to the future challenges of a network.

*What are the potentials of contradiction analysis for projecting future learning challenges for a network? (Dialectical explanation)*

The cycle of expansive learning was used as a model for contextualizing the events/phases through which the actors constructed the heterogeneous object of the Club. Object-oriented events/phases could be interpreted as epistemic actions in the cycle, each of which was directed at solving a specific developmental contradiction in the Club's activity.

**Table 5.9** Tensions at the levels of collaboration and learning analyzed in Chapters 5 to 8

Level of collaboration and learning	Tension	Chapter
<b>Network-ideological level</b>	<b>Ideal-type or heterogeneous network</b>	<b>5</b>
<b>Project level</b>	<b>Firm orientation or network orientation</b>	<b>6</b>
<b>Production level</b>	<b>Trust building or object construction</b>	<b>7</b>
<b>Worker level</b>	<b>Manager or worker perspective</b>	<b>8</b>

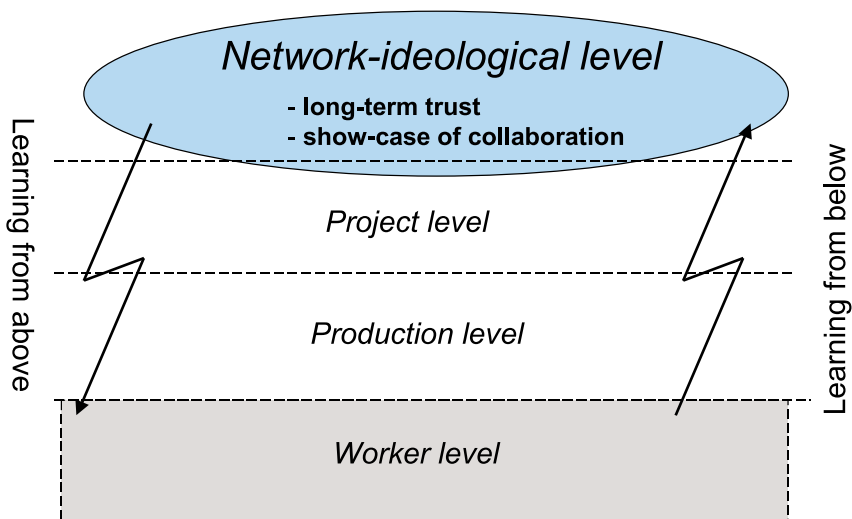
The cycle model may be used as a heuristic tool for showing how each epistemic action produced a new level of learning shaping the activities of the Club. The tensions manifesting the contradictions in the empirical data may be situated in the cycle of expansive learning. *The tensions at and across the levels of the Club's activity will be the object of analysis in the remaining chapters of this study (Table 5.9).*

Thus, my notion of levels differs crucially from conventional ways of identifying levels of analysis in organizational research<sup>35</sup>. Scott (2001) puts forth six categories defined in terms of whether the investigator is focusing on more mi-

<sup>35</sup> See also the discussion on the levels of learning in Chapter 2.

cro or more macro phenomena (ibid., pp. 83-88)<sup>36</sup>. This kind of levels concern the *scope* of the phenomena encompassed, measured, for instance, in terms of space, time, or numbers of people affected. In this sense, the levels of analysis are based on purely formal classifications; no reference is made to the activities taking place at each level or, what is more, in contradictory interplay across the levels.

The tension-laden coexistence of the levels will form the analytical framework of this study (Figure 5.4). This chapter has primarily addressed the network-ideological level of learning evolving in the early history of the Club network. In Figure 5.4, I characterize this level as a forum for (long-term) trust building and as a (short-term) show-case of collaboration in a network. Its relation with other levels emerging in the course of the development will be the research focus of the rest of the analysis. *The question is, how learning transfers and transforms across the levels, from above and from below.* This is depicted by the lightning-shaped arrows in Figure 5.4. The emergence of the worker level was put forth as a hypothesis of the zone of proximal development, which is marked in gray in the figure (compare with Figure 5.2).



**Figure 5.4** The challenge of learning across levels in the Club network

It was suggested that the future learning challenges were situated in the consolidating and reflecting phase of the cycle. Participants were encountering the emerging contradiction between the new activity within the Club and its neigh-

<sup>36</sup> The levels by Scott (2001) are: world system, society, organizational field, organizational population, organization, and organizational subsystem.

boring activities, referring to the activities within the subcontracting firms as well as activities run by the customer firms. As customers were already involved at the project level (Chapter 6), I saw the emerging worker level representing *the zone*.

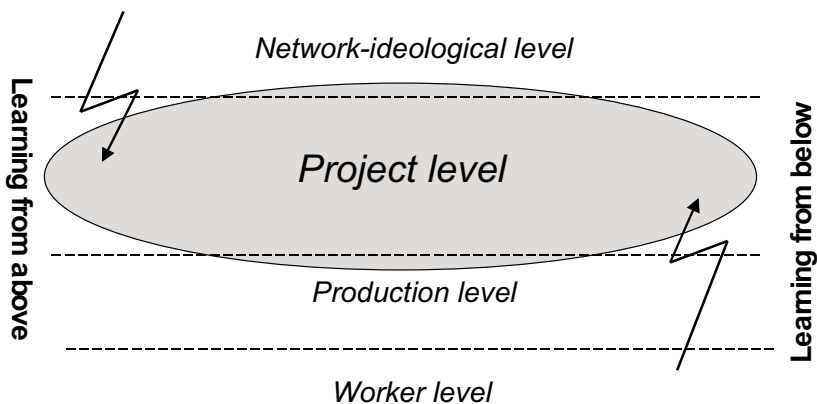
The question put to the managers was: What has networking to offer to the production system in comparison with traditional ways of working and cooperating? The task was to make the heterogeneous object of collaboration visible for the firms. Not accidentally, the emergence of the worker level coincided with the formation of subnetworks between member companies. *The need for integrating the personnel with the ongoing network processes was a direct result of the partnerships these firms pursued together and with their customers*, as pointed out in Chapter 3.



## 6 Firm or Network? Modeling a Collaborative Project Activity

### 6.1 Introduction

The Club-network started from the ideal of a strategic alliance with ambitious business goals, as was shown in the preceding Chapter 5. Early experimentations made the network give up big product projects as the object of the Club's business activity. The focus was shifting from product development to system supplying. This chapter deals with two projects at different historical points of time through which the Club contacted two of its prominent customers (Customer 1 and Customer 2), in order to present itself as a new kind of business partner. The learning challenges of the network are examined at the *project level* (Figure 6.1).



**Figure 6.1** Project level of collaboration as space for learning challenges

Complex customer projects undoubtedly belong to the category of broad inter-firm cooperation (Alter & Hage, 1993; see Chapter 5). Broad cooperation is exposed to conflicts and most likely to fail, the researchers point out. Learning, in this context, must be more complex than a process in which "... entrepreneur-

ial behaviour becomes adapted in an evolutionary way to the discovery of information from trial and error” (Deakins & Freel, 1998, p. 154). My research shows how a group of relatively small subcontracting companies not merely responds to but, by pursuing broad cooperation, rather actively and collaboratively constructs its changing environment. Initially appearing as trial and error activity learning turns out to be an expansive process that crosses the boundaries of the existing activities. I will argue that this process is influenced by the tension between a firm-based and a network-based orientation of running a business, which leads to the second research problem: *How does the network learn to model its project activity when encountering a firm-network tension?*

The project level analysis covers the years 1994 – 1998, in the history of the Club. During that period, the network dealt with two important customer projects, with rather differing contexts of collaboration. I interpret the first one to represent modeling while the second one dates to the applying phase of the Club collaboration (see Figure 5.2). Both cases were discussed thoroughly in the member meetings, encountering, in my interpretation, the firm-network tension as a recurrent dilemma that shaped collaboration. The tension was not purely a product of a researcher’s interpretation but articulated by the members of the network as well. It was referred to, more or less explicitly, in joint discussions and further aggravated in the feedback sessions I carried out in the member meetings as “mini-interventions.”

In what follows, the tension between a firm and a network is first discussed as a theoretical phenomenon in Section 6.2. Data and methods are presented in Section 6.3. Section 6.4 includes the narratives of the projects. Section 6.5 analyzes the ways the focal tension was encountered in the projects. The chapter ends with conclusions in Section 6.6.

## **6.2 Conceptualizing the firm-network tension**

The tension that arises when firms come together to collaborate is very visible. Most of the network literature refers to it in one way or another. For instance, the studies included in Chapter 2 might be read completely from that perspective. Nevertheless, it seems that the firm-network tension has not been analyzed deliberately from the point of view of learning.

Sydow (1992, pp. 78-80) pointed out that a firm, as an autonomous unit, is an ideal type. In reality, firms are in many ways tied to their customers and suppliers, which makes it reasonable to talk about relative autonomy. Relative autonomy of firms makes strategic interfirm networks necessarily heterarchical and polycentered systems, while, at the same time, the characteristics of a network even permeate a single firm.

Huxham (1993;1996) addressed the tension between competition and collaboration in the network context. She used the concept of “collaborative advantage” to highlight the synergy gained through collaboration between organizations, in contrast to competitive advantage.

Collaborative advantage will be achieved when something unusually creative is produced - perhaps an objective is met - that no one organization could have produced on its own and when each organization, through the collaboration, is able to achieve its own objectives better than it could alone. In some cases, it should also be possible to achieve some higher-level ‘meta-objectives’, objectives for society as a whole rather than just for the participating organizations (Huxham, 1993, p. 603).

Huxham recognized different and tension-laden interests of a single organization and the whole network and proceeded to theorize how they can be reconciled at the level of a meta-strategy, developed for a network. She pointed to the need for articulating the meta-strategy and explicating it to members. In the real situation, she said, network researchers and developers more often meet strategies based on “muddled thinking or beliefs.” They are implicitly held views of the common aims, developed over the years through joint working on projects of various types. Consequently, Huxham claimed, it seems likely that the matching between views of different individuals might be quite low. Lacking a joint, overt statement of the aims, participants also show an apparent confusion between descriptions of an organization’s own strategy and a strategy for a given network. “This is shown by the statements people make when talking about strategy: ‘...this isn’t a strategy for (my organization), it is a strategy for Glasgow’ [the given network, HT]...” (Huxham, 1993, p. 607).

I will draw on a multitude of such statements recorded in my discourse data. But rather than looking for reconciliation between a firm and a network, we can make a stronger claim from the activity-theoretical perspective by seeing this tension as the driving force of collaboration and learning. Overt statements of meta-strategy in Huxham’s sense can be important for a network’s cohesion, but people can rarely refer directly to them when encountering and solving acute problems in collaborative projects. Each tension-related statement may be analyzed as a discursive action by which the tension is reproduced and presented to others.

The firm-network tension was manifested in the process of searching for new objects of collaboration for the Club in collaboration with the key customers. Interpreted in the framework of expansive learning, the customer projects became a source of creating and appropriating modes of collaboration that did not exist as yet as ready-made models. The process of model formation that produced different solutions to the focal tension will be the main focus of interest in the following sections.



### 6.3 Methods and data

A *trajectory* covers the life of one project dealing with a customer case. The analysis will go through two trajectories in the history of the Club. A trajectory is made up of *phases* based on shifts in the focus of the customer project (Table 6.1).

The smallest unit of data is a *discussion episode*, a tension-laden piece of a collaborative discourse, addressing a customer case in question. I will expect the firm-network tension to appear in *disagreements* between two or more discussants and also in *dilemmatic talk* of single participants (Billig et al., 1988). In addition, *turning points* in the discussion will be analyzed. They stand for moments of widening or narrowing of the object of collaboration and have significance from the point of view of expansive learning. One discussion episode may contain several disagreements, dilemmas, and turning points. In the following analysis, the excerpts are clippings of longer episodes<sup>37</sup>.

**Table 6.1** Units of data

Unit of data	Definition
<b>Trajectory</b>	Lifecycle of a project addressing a Customer Case as the object of collaboration within the Club (Trajectories of Customer Cases 1 and 2)
<b>Phase</b>	Focus of the project in a given period, bounded by a shift of focus Customer case 1: 1.1) Articulation of Project 1 1.2) Handling of Project 1 1.3) Closure of Project 1 1.4) Reflection on Project 1 Customer case 2: 2.1) Articulation of Project 2 2.2) Handling of Project 2 2.3) Closure of Project 2 2.4) Reflection on Project 2
<b>Discussion episode</b>	Customer Case as a topic of a situated conversational exchange bounded by discursive means of expressing firm-network tension: disagreements, dilemmas, turning points

<sup>37</sup> Examples of whole discussion episodes are given in Section 4.3.

The research data is mostly taken from the meeting discussions of the Club (Table 6.2). The analytical core of the data in both customer cases consists of discussions carried out by the members in two meetings in the handling<sup>2</sup> phase and, after the closure of the case, in the reflection phase prompted by the researcher's feedback. This data is analyzed systematically by discerning discussion episodes addressing the firm-network tension. The complementary data is composed of archival documents, interviews, and recordings of meetings of the Club. In Table 6.2, phases 1.1 - 1.4 and 2.1 - 2.4 refer to the corresponding customer projects 1 and 2. The description of the projects will be given in the next section 6.4.

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<sup>38</sup> Handling refers to the phase of the project trajectory, during which the members of the Club discussed the customer case and formulated strategies of contacting the customer in question.

**Table 6.2** Data collection at project level; C1 = Customer 1, C2 = Customer 2

<b>TRAJECTORIES 1 AND 2 PHASE</b> month/year	<b>DESCRIPTION</b>	<b>MAIN DATA</b>	<b>NUMBER OF DISCUSSION EPISODES</b>	<b>COMPLEMENTARY DATA</b>
<b>Phase 1.1: Articulation 11/1994 – 10/1995</b>	- member's initiative for Club to contact C1 - visit to local unit of C1 by group of members and Coordinator - planning joint meeting with C1			Club Files: minutes of the Board, internal memos, correspondence with C1 Interviews: key members of the project
<b>Phase 1.2: Handling 11/1995</b>	- discussion on the project in member meeting: How to present Club to C1?	Date: November 1995 Meeting: The Fall meeting of Club Participants: Members and Coordinator of Club, researcher Excerpts 6.1-6.6	12	
<b>Phase 1.3: Closure 02/1996</b>	- decision to end the project and planning with C1 in the frame of Club			Club Files: minutes of the Board, minutes of Annual General Meeting
<b>Phase 1.4: Reflection 11/1996</b>	- reflecting and evaluating the project in member meeting	Date: September 1996 Meeting: The Fall meeting of Club Participants: Members and Coordinator of Club, researcher Excerpts 6.7-6.9	3	
<b>Phase 2.1: Articulation 02/1997 – 02/1998</b>	- member's initiative for Club to contact C2 - discussion on C2 in member meeting - visit to local unit of C2 by Coordinator of Club - contacts by C2 with firms - formation of two groups within Club			Club Files: minutes of the Board, minutes of Annual General Meeting Meeting discussion: Board of Club 04/1997, Spring meeting 04/1997 Suggestion paper to C2 by Design Group
<b>Phase 2.2: Handling 03/1998</b>	- discussion on the project in member meeting: What is the model of Club?	Date: March 1998 Meeting: Annual General Meeting of Club Participants: Members and Coordinator of Club, researcher Excerpts 6.10-6.13	8	
<b>Phase 2.3: Closure 04/1998</b>	- agreement between the Production Group and C2			Club Files: minutes of Annual General Meeting Interviews: Key members of the project
<b>Phase 2.4: Reflection 09/1998</b>	- reflecting and evaluating the project in member meeting	Date: September 1998 Meeting: Annual General Meeting of Club Participants: Members and Coordinator of Club, researcher Excerpt 6.14	2	

## 6.4 Two customer projects

### Customer Project 1

#### *Articulation of Project 1*

The idea of contacting Customer 1 in the frame of the Club was first presented by a member whose firm had already established business relationship with the company in question. At the end of 1994, the members of the Club decided to approach Customer 1, in order to discuss the potentials of collaboration between the customer and the Club. Customer 1 seemed to be interested in new types of subcontracting networks such as the Club. It was simultaneously developing its own subcontracting network by reducing the number of the first-tier suppliers and offering quality consulting for them.

In January 1995, the sitting Board of the Club organized a visit of a small group of members to the customer's site, where they met with the head of supplies and one buyer of the unit. As an outcome of the meeting, the head of supplies asked the Club to make a more concrete suggestion of what the Club could offer for the customer. The idea of having a cooperative seminar or event was written down in the memo. However, the event was not organized as planned in the autumn of 1995.

#### *Handling of Project 1*

The Board decided to bring the case to a member meeting, with its proposal of arranging a joint seminar with the customer as planned. In the fall meeting in November 1995, members discussed Customer Project 1 at the level of principle. The aim of the Board members was to collect ideas for the seminar by formulating, above all, the "Club concept" to be presented to the customer. However, some members questioned the idea of organizing a seminar in the near future, and wanted to discuss at which level the customer should be first contacted. I discerned from the discussion two approaches, which I named "lower-plane" and "upper-plane" approaches. This distinction made me first pay attention to the eventual firm-network tension in the Club's activity. After a lively debate, the members decided to organize the event with Customer 1 in about two months, in January 1996.

### *Closure of Project 1*

Despite the decision, the seminar with Customer 1 was postponed once again. In the next meeting in February 1996, the members agreed on ending the project. A resolution was written down in the minutes:

Decision: Those who wish to carry on philosophical discussions with Customer 1 will contact the coordinator [of the Club] to continue the communication with Customer 1. Those interested in the issue will commit to taking it forward. The treatment of the project is hereby considered finished. (*Club files 02/96*)

### *Reflection on Project 1*

In the fall meeting of 1996, I had the first opportunity to present my research observations on the Club to the members. I decided to do it by analyzing the discussion on Customer Project 1, from the previous year. The topic was still considered to be relevant for the Club's activity. The researcher's feedback offered a moment for reflection and evaluation of the project. Temporal distance from the project allowed members to assess its meaning and outcomes. It seemed as if an implicit model for the project activity had been formed.

## Customer Project 2

### *Articulation of Project 2*

Customer 2 had a status similar to Customer 1, as one of the most important customers of the Club firms. In the meeting in November 1996, one member directed attention to the fact that about ten Club firms were supplying Customer 2 on a continuous basis. For example, there was a production line of which the Club firms supplied about 80 %. He argued that the collaborative potential of these firms, in relation to Customer 2, should be utilized in the frame of the Club. Later, he addressed the Board with an initiative to contact Customer 2, in order to discuss system supplying. The newly hired coordinator of the Club supported this kind of activity. An interesting discussion emerged in the member meeting in April 1997, articulating the firm-network tension and anticipating Customer Project 2 about ten months later. This way of discussing at the network-ideological level depicts well the expansive learning potential of the Club, analyzed in Chapter 5.

In the late summer of 1997, the coordinator of the Club visited one of the managers of Customer 2 to discuss the potentials of the Club collaboration. According to the memo, no concrete issues were raised. The parties discussed general principles and problems to be solved if a subcontractor was a network of firms instead of one firm. The coordinator wrote down, among other things, one of the viewpoints put forth by the representative of Customer 2: "In principle, an extra phase added to the production chain is not beneficial, it must bring added value! There is a danger that the price is multiplied in a network."

At the beginning of February 1998, some Club members learned that Customer 2 was going to outsource a production site in the near future. A member of the management group of Customer 2, who ran the outsourcing operationally, contacted two or three Club members known personally to him as long-standing suppliers of Customer 2. (The same manager had met the coordinator of the Club a couple of months before, as mentioned above.) The outsourcing of a whole site, containing the assembly of complex production machinery and lines, was considered an ideal case for a network. Naturally, the firms wanted to sustain and secure their supplier status in the future, despite the major organizational change of the customer.

Two collaborative groups were formed simultaneously among the Club firms, without them being aware of each other's existence. The aim of both groups was to make an offer to Customer 2. I will nickname the groups "Production Group" and "Design Group," referring in very general terms to the contents of the offers. (It is not possible here to go into details of the offers.) Obviously, the starting point of both groups was similar in that they extensively utilized the Club collaboration. Both groups searched for a composition of member firms answering the production-related interests of the customer in the best possible way.

### *Handling of Project 2*

Soon after starting preliminary negotiations with Customer 2, the groups became aware of each other. From the perspective of the Club, an unexpected new situation had occurred; so it was decided to bring the case to the member meeting. One of the touchy issues in that discussion was whether the Club should act consistently and approach the customer with one offer instead of two. The representative of the Design Group spoke strongly for one offer whereas the Production Group seemed to be unwilling to disturb the negotiations going on with the customer. Once again, the debate seemed to involve the firm-network tension, but it was not a replica of the tension observed in the case of Customer 1. During the discussion, it already seemed likely that the Design Group would withdraw,

and the Production Group would continue the negotiations with the customer. The offer of the Production Group addressed the outsourcing of the production unit in accordance with the customer's primary interest, whereas the Design Group had made a suggestion of also taking over a considerable part of the design activity.

### *Closure of Project 2*

After the discussion took place in the Club meeting, the Production Group continued negotiations with Customer 2. As a result of this process, four firms of the Production Group founded a new company that took over the major part of the outsourced production. The remaining part of the site was outsourced to a company outside the Club.

### *Reflection on Project 2*

Half a year later, I presented my second research feedback, drawing on Customer Project 2. The discussion in that situation served as the reflection phase of the project. In this case, the reflection was colored by the fact that a new company had been founded as an outcome of the Club collaboration. This outcome, and the process that had led to it, represented a model-in-action for the participants. Nevertheless, the need for articulation of the joint model was still expressed.

### *Two customer projects compared*

The starting point of the two customer projects was apparently similar, addressing a prominent customer of several firms of the Club. In both cases, a member of the Club presented the idea of developing the supplier relationships with the customer by utilizing the Club collaboration. The differences are also obvious. Project 1 represented a philosophical discussion carried on in the Club, whereas Project 2 dealt with a real case introduced by the customer.

From the point of view of this research, the most decisive difference was the historical timing of each project. In the framework of expansive learning, Project 1 should be seen as shaping the firm-network tension as a learning challenge in the modeling phase, whereas Project 2 reveals how the Club solved the tension and applied the model in project activity (Figure 6.2).

## 6.5 Encountering the firm-network tension

### Customer Project 1: How to present the Club?

The discussion analyzed here was carried out in the morning session of the fall meeting of the Club that took place in Central Finland. Eleven participants were gathered in a conference room of a hotel, the site for a two-day meeting: eight members out of seventeen represented by executives, the coordinator of material supplies hired by the Club, the coordinator-secretary of the Club, and myself as a researcher, for whom this was the first fieldwork contact with the Club. The coordinator-secretary and the researcher did not talk during the discussion, the former taking notes and giving only short comments, the latter videotaping the session.

The sitting chair of the Board (Member 1) gave an introduction to the theme by going through the history of the project and explaining the planned groupwork and discussion. A set of questions was given to the groups: How can we make ourselves important for Customer 1 (before the next depression sets in)? What does each firm supply to Customer 1 at the moment? What are the advantages of collective Club-level presentation? What are the obstacles of collaboration between the Club and Customer 1? After the groupwork, members gathered for an hour-long discussion. The chair (Member 1) actively led and structured the discussion that was characteristically spontaneous and informal.

I discerned twelve discussion episodes dealing with the firm-network tension. There were eleven points of disagreements (tension between two or several members). One of the disagreement episodes also included a turning point, and another was composed of two dilemmas (tension within one member's turn). The third dilemma was found apart from disagreements. The turning point is analyzed first, then the disagreements, and finally the dilemmas.

The members started with the question: How to make ourselves important for Customer 1? In this phase, there seemed to be agreement: We must find out what the larger entities of production are that the customer is ready to assign to its suppliers. We must start from supplying smaller entities and, as our credibility as a group increases, we will gradually increase the entities. The turning point of the discussion occurred in the middle of this topic, when Member 2<sup>39</sup> suggested that he could first informally contact a person on the customer's side whom he knew personally. Another member supported him immediately, but Member 1 pulled back.

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<sup>39</sup> Members are marked with a number in the order of appearance. A given number refers to the same member throughout the analysis of this chapter. Member 1 is Manager C1 in Chapter 7.



*Excerpt 6.1*

*Member 1:* Couldn't we slow down the situation now that we [have] decided to enter a joint event with them, so let's look at the situation for a moment and see how we are going to proceed.

*Member 2:* ## But I could look into whether this is the right way.  
(*Meeting 11/95*)

Thus, two ways of approaching the customer appeared, which I will call "upper-plane" and "lower-plane." The first one aimed at organizing a seminar with the customer, in order to present the Club and find out the interests of the customer. The second one preferred approaching the customer through personal contacts emerging in everyday business, in order to find out the best way of presenting the Club. In fact, the first one was the initial topic of the meeting, prepared by the Board, whereas the second one popped up in the turning point.

But these frontlines seemed to involve even more far-reaching strategic questions concerning the model of activity. The upper-plane approach emphasized the leading role of the Club in the transition to a network-based business, involving the production of considerably *larger entities* than those produced by firms under the prevailing conditions. For the lower-plane approach, the role of the Club was to promote the already existing interfirm collaboration by making it official and established as a practice of production. The possible growth of business was associated in the first place with *larger volumes* of production.

A long episode in the middle of the discussion reveals various dimensions of the firm-network tension. The episode was preceded by an intermediate reminding of the starting point of the discussion (Excerpt 6.2). Member 1 expressed a dilemma, but it did not involve the tension focused on in this analysis. (He claimed that the event was arranged in order to find out who are "the right persons" for collaboration, and that the event must be planned so that "the right persons" will be present in the event.)

*Excerpt 6.2*

*Member 1:* Hey, now that we have got stuck in this business of how to make ourselves important to Customer 1 before the recession sets in, we have stopped talking about just those persons and about how [to contact them]. Aren't we now just about to arrange that kind of joint event to clear up all these questions? We ought to find out there the right persons to take care of these issues. (//) We should somehow manage to be able to tell this to get the right people to come to that event.

*Member 3:* Well, if I may specify or return to that. We have had this idea of arranging a kind of contact event, in which there would

be Manager X from Customer 1 and, at least, the managers of supplies, possibly the management of production and so forth. We have discussed this, and this has been accepted as a model in principle. The reason why we haven't arranged this event yet is that we haven't had the concept by which we would act there and tell [about our activity]. (//) And we are here now after that concept; the purpose of this groupwork is that we find out how to raise interest in the customer, to have a concrete model to present, something on a broader-scale. In that sense, we have proceeded further; we should somehow gain access as a group. Now we are there as individual firms. In this way, if we can get in as a group, then those of us who are already in there would surely act as locomotives around which the bigger projects would be organized. They have already gained the basic trust, and the Club background would bring the surplus value. (*Meeting 11/95*)

The discussion episode continued with a comment by the material coordinator, who agreed with Member 3 but argued that personal contacts and some background work would still be needed to get more customer information to create a good enough concept. Illustrating the nature of the discussion, the next turn addressed the practical issues of contacting the customer instead of further discussing the concept (Member 4, Excerpt 6.3). Typically, practical issues were continuously mixed with strategic issues. The episode proceeded as a debate between Members 3 and 4, who obviously represented opposite approaches.

*Excerpt 6.3*

*Member 4:* And the more we can get the brochures of the Club into the hands of the purchasing agents there, the more they will be pressed to notify the upper management that there's this kind of conglomeration. You can't deny it!

*Member 3:* I just... listen, [Member 4], it's just the other way around. I'll explain more: Strategic decisions are made at the top. The buyers cannot force pressure. They work hard and – damn it – worry about their own jobs! (//)

*Member 4:* No, but what I learned was that the problem was just the opposite. (//) They are so busy right now and with no more people going to be hired in the buying organization, they have to manage it all. The desktops are overflowing with paper and blueprints. When you go and visit them, they stick a bunch of blueprints into your hands with “take care of them.”

*Member 3:* Yes, I know the present situation, but, nevertheless, all big decisions are made at the upper level and it's there they are solved and pushed through. So we should really try and sell that concept or that contact event to them. (//) (*Meeting 11/95*)

At the end of this long episode, the tension was articulated most explicitly in the debate between Members 3 and 4.

*Excerpt 6.4*

*Member 4:* (//) And now we must come to terms with whether we, who know these people, will continue the inner discussion at the lower level, or whether this will lead to a situation in which everything is organized through Manager X [Customer 1]? To know how to proceed...

*Member 3:* I am not against that kind of activity. It's important, of course, but it is not a solution to the question of how we could get in and present ourselves, really as a group. What this group [stands for]... Or how, by means of the group, they could gain some [advantage] they haven't been able to gain through a normal subcontracting network. It's a regular kind of job to present oneself and give information [that Member 4 suggested], but, in my view, this is not the best way to advance our project.

*Member 4:* Are you afraid of losing something in this?

*Member 3:* No, I won't lose anything. I can advertise here, I would get much more, [the Firm] would get much more work [from Customer 1], but I want to limit it to a certain level with this concept. (*Meeting 11/95*)

The dilemmas show even more clearly than the disagreements the difficulty of articulating the model of the Club in the course of the discussion. The disagreement episode in Excerpt 6.5 includes two dilemmatic comments (keywords with *italics*) representing the upper-plane (Member 5) and the lower-plane (Member 4) approaches. Member 5 is pondering on possibilities of organizing business in the frame of the Club. Unfinished sentences and wavering between the perspectives (joint activity, firms, association) indicate dilemmatic talk. Member 4, answering Member 5, starts his turn by presuming a clear judicial procedure (for business in networks), but ends up with a claim that the question is not, in fact, judicial. The dilemma lies in the internal inconsistency of the argumentation.

*Excerpt 6.5*

*Member 5: (//) What will be the way that guarantees the success of our joint activity, not only... Even though all the firms are working well separately, at the moment, will it then... As it cannot really be the registered association [the Club], then what would be the way to manage the procedure judicially as well as, of course, operationally?*

*Member 4: Judicially, this is just managed in such a way that, as they want to reduce the number of their suppliers, one [firm] will be responsible for two or three [firms] and say, "I am the supplier taking the main responsibility [for the order], and one and another of the Club firms are subordinate to me, and we will do the work." It is not judicial; it's just that one [firm], in principle, is responsible to Customer 1. (//)*

*Member 5: ##So should we have a vision, in one or two years or in some other time span, of some kind of a joint-venture type of system, in which a group, according to certain principles, would take responsibility for a considerably bigger entity than a single member [firm] would not perhaps be willing to take? (Meeting 11/95)*

The judicial aspect and the idea of a joint venture were not discussed further in this meeting. Member 5, who presented them, was a newcomer who did not personally share the early experiments of the initial members (Chapter 5). It is plausible that those members who did purposefully avoided hurrying too much in this issue.

Finally, the third dilemmatic episode near the end of the discussion was, in fact, produced by two turns (Member 1 and Member 3 in Excerpt 6.6; keywords with *italics*). Member 3 referred implicitly to various models having come up in the discussion. He also commented briefly on the joint venture model, but rejected it knowing the "feelings" of the majority of the participants. As emerges in Excerpt 6.6, Member 1 as the chair produced the dilemma by explicating the ever-present division between member firms' and Club's interests. It was an immediate reflection on the viewpoints of Member 3. The tension is manifested in the fact that his question produced a dilemma (nicely indicated by a cluster of 'buts').

*Excerpt 6.6*

*Member 1: Are we now forgetting the question Member 3 was talking about? There are in fact two; this can actually be divided into how a single Club firm would make itself important to Custom-*

er 1, and how the Club as a whole could be important to Customer 1.

*Member 3:* Yeah, or how can the Club give single [firms] impetus for getting access in (larger entities?). Because it's the single firms that make the business... The Club cannot... unless it's going to found a business company in [City X, location of Customer 1] or in some business village, that's another story. **But** certainly it doesn't sound like smart way of... **but** rather in this way... It will be organized through single firms, **but** we kind of lack... It seems that somebody wants to expand the traditional subcontracting and proceed in that way. We have firms at different [productional] levels in relation with the firm in question.

(Meeting 11/95)

The dilemma was associated with the difficulty of articulating a proper model for the Club. The business should have exceeded the limits and conditions of the production activity run by single firms, but at the same time, the firms would have organized and managed the new business. The alternative to a firm-based model was a Club-based model with a new firm to be founded near the unit of the customer, but this was not seen as a desirable or realistic option.

### Reflection on Customer Project 1

The reflection on Customer Project 1 took place in the fall meeting, one year later, where I presented my research observations to the group by using the project as an illustrative case of collaboration. Two reservations must be pointed out: First, in that phase of research I did not focus primarily on the firm-network tension but it occurred as one topic among others. Secondly, the participants were not exactly the same as the previous year. Five members out of eleven had participated in the discussion on Customer 1. (Naturally, all members knew about the project from other contexts.) Nevertheless, the apparent differences between the discussions cannot be explained by these facts. The variation stemmed from the changed historical situation and the nature of each discussion (handling vs. reflection).

In the handling phase, the discussion served problem solving characterized by disagreements and dilemmatic turns of the speakers. In the reflection phase, these did not arise significantly. The project was mostly evaluated in a positive tone. My intervention could not produce the frontlines that had existed one year earlier. This may imply that a solution or settlement of some kind had been achieved between the upper-plane and the lower-plane.

I picked up all discussion episodes in which the firm-network tension connected with Project 1 was addressed. I discerned three such episodes containing dilemmatic talk (marked with italics in the excerpts). In Excerpt 6.7, Member 6 expresses a dilemma by claiming that the initial goal of informing the customer about the Club was realized to some extent but, in fact, the customer was not necessarily aware of the collaborative deliveries of the Club firms.

*Excerpt 6.7*

*Member 6:* It's fun really to look back, and there seem to be two things coming out clearly (//): That we would like to do something small or a bit bigger together, and *Customer 1 wanted to hear about the experiences of what we had accomplished*. These two things have *now been realized* somewhat. For instance, *Customer 1 doesn't know yet what we have done together*, whether we have already done some little thing. One interesting [issue for us is] (//) how to start a project quickly, share the responsibilities, and do the job from the beginning to the end in a shorter time than single firms would do it. So these are the basic issues we are looking for, namely, how can we be effective together; more effective than alone. (*Meeting 11/96*)

The participants of the discussion agreed upon the actual outcome of Customer Project 1. Namely, even though the project with Customer 1 had not achieved its ultimate goal, it had been productive in terms of bringing value to single firms. In general, the participants of the discussion seemed to accept the present situation in which the projects were run within firms or between small groups of firms. Members saw collaborative customer projects among two or three firms as a practice for future projects run by the Club. However, the fact that the Club had not been able to manage big customer projects was disturbing and caused dilemmatic argumentation.

*Excerpt 6.8*

*Member 7:* It is an achievement itself that firms as firms could get access there. But should the others, (//) now there's... There's collaboration between Firms 2 and 7, there's collaboration between Firm 2, Firm A, Firm 1, should we write something down about these? And analyze these cases from the perspective of running similar projects in the future with Customer 1? Our examining of [the big product development projects at the start of the Club] was kind of a practice run. *But we cannot take them in such big chunks*. They will emerge in a natural way as they have

emerged thus far. *And, after all, the most important thing is if, through the Club, we can get direct contacts and business with the firms, or the firms get [contacts and business] from [the projects] that we have expended a great deal of energy on. It's a good thing. If we can get [these results] with an even bigger group, then really the idea of the Club starts to work.* But, in any case, we are on the positive side. These [realized cases] should probably be analyzed. (Meeting 11/96)

Member 7<sup>40</sup> urged the systematizing of the learning outcomes of the collaborative customer projects already in action. This was actually the main point I put forth in the intervention. It is possible that my presentation contributed to arousing this dilemma. The hesitation by Member 7 involved a partial acceptance of the present situation as bringing value to firms (“the most important thing”, “a good thing”), while simultaneously pointing out that the idea of the Club had not yet been realized. On the one hand, the Club was incapable of dealing with big production entities (“cannot take them in such big chunks”). On the other hand, the realization of the idea of the Club depended on big projects (“then really the idea of the Club starts to work”). Member 1 (the chair in the handling phase of Project 1) wanted to push this critical point further.

*Excerpt 6.9*

*Member 1:* My question is, why do we still discuss this Santa Claus topic [nickname for Customer 1 used in this discussion]? Now we are expressing private opinions. I can't get a grip on them. We are talking about peanuts, the peanuts some firms among us manage brilliantly. And then we are discussing how we could get more out [of the customer]. But I don't feel this group has the muscle needed in case we have luck with Customer 1. We think Customer 1 is Santa Claus, as do many others, but if we received that project, we couldn't necessarily carry it out. [A reference to the case of another network, not audible.] But in our group, we cannot find such a composition, in my view, that we could take on any of those projects. At this moment, these firms that are somehow managing their own peanuts are capable of doing that and managing the surroundings nearby. But as we proceed to a larger entity we are facing so much of what is new that we can't respond to that challenge, at all. If we can do the design, it will

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<sup>40</sup> Member 7 appears as Manager B in Chapters 3 and 8.

be stuck in production. Then, what are we looking for with all this? Tell me! If we want to search for a bigger entity, let's accomplish it with a factory (//). And an organization that will start running these projects and the business. But with the present composition it will not succeed. If we go and present it to Customer 1, they will think that these guys have no idea of what they are talking about or aiming at. I think this discussion is OK but it doesn't lead anywhere. It is going around in circles because we haven't got the required capacity. (//) Maybe we are waiting for a big present that is to be given to us. (*Meeting 11/96*)

This comment can be seen as an effort to provoke a disagreement to be debated further. However, others did not react, obviously unwilling to "heat up" the discussion. The disagreement Member 1 tried to produce was located between the upper-plane and lower-plane approaches. He saw that what now was pursued was, in my terminology, a lower-plane model from which a leap to the upper-plane was unrealistic.

Nevertheless, the problem of Club-based customer projects continued to puzzle the minds of the members. The present activity, big projects run by single firms or a couple of firms in collaboration with Customer 1, was accepted as a model preparing the members for future projects within a broader network. *This was neither an upper-plane nor a lower-plane model, but rather some kind of "middle-plane" approach.* Several speakers (e.g. Member 7 in Excerpt 6.8) referred to the fact that firms already had bigger projects, involving more interfirm collaboration and project management than was usual in traditional subcontracting. Member 1, with a lower-plane "provocation" (Excerpt 6.9), failed to see the potential of this activity. The final transition from a firm-based to a Club-based model could not be conceptualized and articulated for the time being. This was reflected in the ironic references to the "Santa Claus" customer who would finally give a big present to the group.

### Customer Project 2: What is the model of the Club?

At first glance, Customer 2 appeared as Santa Claus with a big present. However, the customer's initiation was preceded by a long articulation phase within the Club long before the actual case entered the firms. Did that phase prepare the Club to meet the customer's needs? Did they follow the middle-plane model that seemed to be forming in the project activity of the Club?

The handling meeting took place in a seminar room of an insurance company in Helsinki. Thirteen members (out of twenty), the coordinator-secretary



and the researcher were present. The vice-chair of the Club chaired the meeting and the discussion. The coordinator took notes, and the researcher audiotaped and took notes. The discussion started with Member 8's summary of "what had happened." He presented a one-page memo on an overhead projector, and remained in the front of the room, participating actively in the debate that followed. Compared to the discussion on Customer 1, the debate included much more overlapping speech.

I discerned eight discussion episodes. One of the disagreement episodes included two dilemmatic turns; other episodes were composed of two dilemmas, one turning point and four disagreements. The dilemmas within one speaker's turn involved hesitating over whether the groups had done the right thing and followed the generally accepted norms of the Club when contacting Customer 2 (Excerpts 6.10 and 6.11, dilemma elements with italics). The members agreed that the groups had been forced to act quickly and to take the customer's delicate situation into account. Nevertheless, by evaluating the case they confronted the fact that, within the groups, they had acted "secretly" and competitively as opposed to the openness of the Club. Member 8 concluded his introduction on "What has happened" by a dilemma. He claimed that the Production Group had been going the "right" way but, on the other hand, whatever that way was within the Club, it was inarticulate. As a newcomer, he had realized that this discussion had been going on within the Club without a clear solution.

*Excerpt 6.10*

*Member 8: So, are there any questions about this topic? I wanted to make this report in order to bring forth what has happened. I am the youngest member in the Club, kind of... I don't want to give an image that we have acted behind people's backs. (//) This group [Production Group] thinks that it has acted here in the right way, also ethically, also, but, or, then, we have misunderstood it. We should have this discussion, what this is all about. But this discussion has obviously been going on for quite a long time.*

(Meeting 03/98)

The discussion episode just before the turning point contained a latent disagreement expressed with dilemmatic comments by Member 3 (Production Group) and Member 9 (Design Group), casting light on the simultaneous formation of two groups (Excerpt 6.11).

*Excerpt 6.11*

*Member 3: (//) This is not a competition between us, at all. The problem is the fact that there are others making offers. [Mumbling sounds in agreement.] The core of the question is what we agreed then, that we would not talk about this. There have been all kinds of inquiries from the outside. (//) We can't spread around these issues, we must also show respect for the point of view of the customer. This was not an issue for the member meeting to (jam it through). No way!*

*(//)*

*Member 9: How did you answer [the customer's approach]?*

*Member 3: I said I must think about it. You can't say OK right away. You must give it some thought.*

*Member 9: Namely, I asked [the customer] bluntly about who else is involved in this, because I thought I don't want to muddle the affairs. And they said that, for instance, Firm 3 is not involved at all. (//) That's what I mean, (in the Club we ought to) always have a very open atmosphere. There ought to be power in togetherness.*

*(Meeting 03/98)*

The dilemma was being produced to reconcile the obvious contradiction between the openness and trust of the Club and the actual way the members had acted in the critical situation with Customer 2. Member 3 claimed that the case did not involve competition between the Club firms, but explained the secrecy his group had pursued. Member 9, in disagreement with the viewpoints of Member 3, emphasized openness, but he had not communicated directly, either, within the Club when receiving the case from Customer 2.

*The turning point may be characterized as a shift from the practical questions concerning the surprising situation within the Club (two competing offers) towards the question of principle concerning the model of the project activity of the Club (Excerpt 6.12). Here even the researcher became involved in the discussion. The newcomer, Member 8, quoted at length from the historical analysis, including my interpretation on the early projects of the Club. Drawing on that, he challenged the participants.*

*Excerpt 6.12*

*Member 8: (//) In other words, you have had these contradictions on the table before, and you have discussed them, and so on. So if there are concrete rules so that, say, a member gets an inquiry, it will be brought here [in the Club], or the other way around,*

that someone takes up a case together with some others. In my view, if we are going to reach results, we must search for a model, and which one will it be? [It's evident that] single firms are pursuing their own business interests.

*Member 7:* The model thus far has been like in this case, that two groups were formed. So, in the same way, we have freely formed these groupings. But, in this case - instead of arguing with each other while the third party gets the fish – I would start to discuss how these groups that have made the offers could unite and, as one group or a part of it, bring in the deal home. (//)

*Member 6:* I see this situation as a little different from the earlier cases. (//) Earlier, we in the Club approached, for example, Customer 1 and organized [something]. In this case, Customer 2 is in trouble, because they have to manage the outsourcing (//). And our companies make up a considerable portion of the turnover they get from production. (*Meeting 03/98*)

In Excerpt 6.12, Member 8 mentioned two alternative rules of forming business groups within the Club, resembling “upper-plane” and “middle-plane” approaches. I interpret his final comment, “single firms are pursuing their own business,” to refer to a situation without rules of collaboration, which might be compared with the “lower-plane” model. Member 7 confirmed that the model thus far had been of a middle-plane type but, in this case, it should be shifted to an upper-plane type in terms of performing as one group within the Club. Member 6 (Production Group) pointed out that the special aspect in this case was the real need of the customer directly addressing the production of the firms.

Both groups had followed the middle-plane procedure when forming a group without consulting the Club (upper-plane). The difference came out in the contents of the offer, the Production Group building on a subnetwork of four companies according to a middle-plane model, and the Design Group presenting the idea of drawing on the whole Club network (upper-plane). After the turning point of the discussion, the debate on middle-plane and upper-plane models was taking place between the Production Group (Members 3, 6 and 8) representing the former, and the Design Group (Member 9), representing the latter (Excerpt 6.13).

*Excerpt 6.13*

*Member 9:* Could this meeting at least give a recommendation that the Club... the Club firms took the deal together, or then, another resolution to the effect that it will not matter how the case is managed, I would like to receive some kind of guidelines.

*Member 1:* But we don't know, we haven't studied the case (-).

*Member 9:* But for the sake of the Club spirit, that's what I mean. You don't need to know the case, just the Club.

*Member 6:* We have been talking about cooperation groups inside the Club running projects together. There was [one of the early projects] I didn't participate in, I didn't even know that it existed. Those groups gather around various themes to run them together, and there are even cases in which outsiders join us. That's how we have presented it in our brochure as well.

*Member 3:* I suggest that we wait and see what is the next move of Customer 2. I think this has started in the way that we cannot... Of course we can put forth ideas, but until we know this setting we cannot define the need, so, let's not fix it yet. But I don't see we can (proceed) by any recommendation or pressure from the Club. We must (look at the whole picture). (*Meeting 03/98*)

Middle-plane, in this context, implied approaching Customer 2 as separate groups. Club collaboration would be kept in the background while listening carefully to the needs and decisions of the customer. Upper-plane supported some kind of joint agreement between the groups and approaching the customer as one group of the Club. This would lead to a more powerful presentation and even impacting on customer's decisions. Moreover, Member 9, representing the Design Group (upper-plane), urged the meeting to formulate an "official" resolution by the Club concerning the future actions in Customer Project 2. Members 8 and 3 from the Production Group saw this as undesirable dictating from above.

As came out of the narrative of Customer Project 2, the Production Group "won" the case. It continued successful negotiations with Customer 2, but it also won within the Club in the sense that the middle-plane approach was followed.

### Reflection on Customer Project 2

Five months later, the Club held the fall meeting in Hotel Viru in Tallinn, Estonia. I had a second opportunity to present my research results. Drawing on the earlier historical data (Chapter 5), I analyzed the project activities of the Club, claiming firm-network tension to be present in collaboration. To show this, I used the case of Customer 2 and the discussion data reported above. There were 21 management level participants from 17 firms and 2 subsidiaries, and the coordinator of the Club. (The Club had grown to a network of 20 member firms

and 9 subsidiaries of member firms.) All four members of the Production Group and two out of three members of the Design Group were present.

Once again, the nature of the reflection talk differed considerably from the debate in the handling phase. My presentation raised a lively discussion but could not reproduce the frontlines of the two groups. The case itself had been settled; the reflection was directed at the customer's actions during the project and to the solution the Production Group had reached as the outcome of the project. The success of the Production Group was seen as proof of the efficiency and trust within the Club. A representative of the Design Group admitted that the suggestion for taking over the design activity (not only the production) had resulted in exclusion from the negotiations at the very beginning of the process. The fact that two groups of the Club had not united or continued discussion at any level after the handling phase was not reflected upon.

The discussion included two tension-laden episodes, expressing relatively weak disagreements. The first one arose between Member 3 (Production Group) and Member 9 (Design Group). It addressed the question of whether it was sensible, regarding Customer 2, to form two competing groups within the Club. Member 9 felt that he had been misinformed when told by the customer that Firm 3 (Member 3) was not involved in the outsourcing process. This problem had occurred in the discussion in the handling phase, as Excerpt 6.11 above shows. However, the fact that members 3 and 9 had not communicated directly (which led to the formation of two groups) did not evoke reflection on the procedures of the Club.

Nor could Member 8 (Production Group) provoke a debate on the model of the Club when he presented his interpretations of the two approaches I have named upper-plane and middle-plane (Excerpt 6.14). This provoking episode, without considerable reactions, resembles a comment by Member 1 when reflecting on the case of Customer 1 (Excerpt 6.9). Now Member 1 responded to Member 8.

*Excerpt 6.14*

*Member 8:* I see it very clearly that we should discuss the model of activity of the Club. Our way is based on the idea of building activity around the case, and the old way is, I think, the old Russian way, in which you have a commission that thinks and thinks. Our model, I believe, is flexible and fast and we can advance quickly. We are able to adapt to the customer's case and we can get more deals for the Club. But considering the other way, I guess we would still be carrying out a value discussion on Customer Case 2, and we would have been excluded from the case. I think the other way around is, how should I put it, more

equitable and unbiased, but it is also more uniform which doesn't necessarily bring results. And the other way is then more present-day in that we differentiate the activities into smaller units of performance. But, if we can get a common DNA or a common code by which they will work, then it will bring value (-) and increase the importance of the Club and, in that phase, we can achieve better results. (//) It might have been stuck in bureaucracy, in which case we would mention it today as a good deal that could have become a good deal if we had got it. Of course this is a little provocative.

(//)

*Member 1:* Now we are (really philosophizing) but I would keep my feet firmly on the ground also in this case by asking how we have arrived here. We should not (interpret this case self-conceitedly), pretending we have invented something new here in the Club. I think there has been a societal need for this for a long time now and we here in the Club have fortunately understood, or the managers of firms have, the members of the Club have understood that (external changes have signaled outsourcing tendency in big companies). (//) Certainly there are several cases like this in Finland, as well as in the rest of the world, aiming at increasing efficiency. And I think it's fine that the Club could produce this kind of group that was considered efficient. This is an opportunity for us. (*Meeting 09/98*)

Member 1 seemed to claim that the philosophical discussions of the Club might remain detached from the mundane reality. The modes of action were formed by being open to the surrounding business environment and by answering the efficiency claims of customers. A comment like this kept the model an open question while stating that it was the efficiency and actual results that counted.

## 6.6 Conclusion

The starting point of this chapter was that the project level collaboration was molded by the tension occurring between the firm-based and the network-based orientation. This tension was empirically analyzed from the dilemmas, disagreements, and turning points occurring in collaborative discourse. The tension proved to be a useful construct for analyzing how the members of the Club carried out customer projects and modeled the project activity. Most importantly, it provided continuity for the analysis from one case to another at two histori-

cal times, revealing that the tension in question was being transformed along with changes in the network collaboration. These transformations included collaboratively produced local solutions to the customer cases, which explains why my interventions could not reproduce the tension as it had manifested in the handling phase.

**Table 6.3** Three models of collaboration in project activity

	<b>Lower-plane</b>	<b>Upper-plane</b>	<b>Middle-plane</b>
<b>Subject</b>	Member firm	Network of member firms	Subnetwork
<b>Object and Outcome</b>	Customer's order Part-product	Customer potential (Potentially: Design and production of large systems)	Customer's need Production of relatively large systems
<b>Tools</b>	Personal contacts at operational level <sup>41</sup>	Collective presentation at strategic-management level	Personal contacts at strategic-management level
<b>Rules</b>	Cooperation and competition	Trust, cooperation	Flexibility and speed, competition possible
<b>Community</b>	Member firms fit for customer's order	All member firms	Member firms fit for collaborative project
<b>Division of labor</b>	According to stages of production (Customer: order and design, Firm: supplies, manufacturing, delivery)	According to rules of network organization (Member: initiative, Coordinator: communication, Board: proposal, Member meeting: decision)	According to requirements of project (Customer: inquiry, Members of Club: networking and offer, Customer and Firms in partnership: agreement)

<sup>41</sup> See, for instance, Doz & Hamel (1998) who distinguish between the operational and the strategic levels as scopes of building interfaces of a partnership. The operational level is the one "where the detailed knowledge of the alliance tasks resides and where specialists can communicate with specialists" (ibid., p. 137), whereas the strategic level defines the interface between CEOs or senior executives addressing primarily the value creation logic of the alliance. Thus, the operational level becomes most important in partnership models.

The research question was: *How does the network learn to model its project activity when encountering the firm-network tension?* Three different approaches to deal with the firm-network tension in the customer projects were identified: “upper-plane,” “lower-plane,” and middle-plane.” The models dealt with rules and practices, including questions such as how to contact customers, how to inform the network of new cases, and whether to act “as firms” or “as the Club.” In conclusion, I will articulate each of the historically emerging models and suggest their implications for learning (Table 6.3).

Table 6.3 is based on the notion of the changing meaning of the firm-network tension. In the early phases of the Club collaboration, the firm-based lower-plane model was observable in the debates. Collaboration in the frame of the Club was seen as a natural extension of the interfirm cooperation having formed with time among single firms. There were obvious difficulties in figuring out the strategic-level profits and growth that networking would bring with it. This came out in the problem put forth by Member 4 during the discussion on Customer Project 1. Member 4 commented on the visions of growth by reflecting (ironically) on future options regarding his firm’s longstanding cooperation with another member firm.

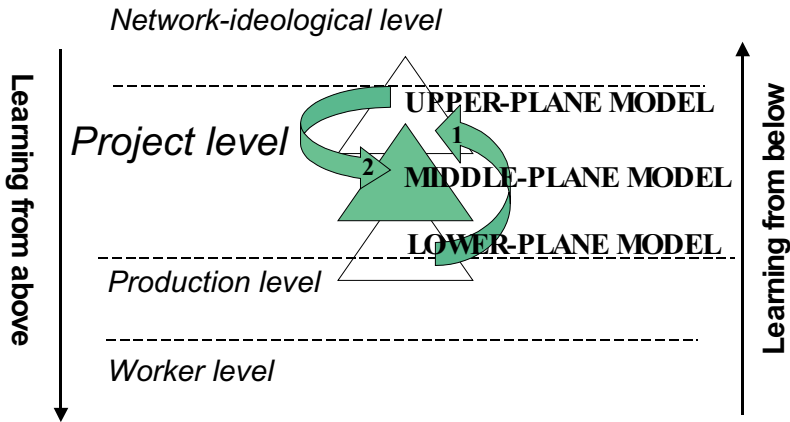
If I now try to imagine that we, in collaboration with X Engineering Works, would make to Customer 1 a lump valued at million marks, I only wonder how that would look! (Member 4, 11/95)

Figure 6.2 outlines the project-level learning I will discuss in the remaining part of the chapter. The lower-plane model represented an opposite pole to the upper-plane approach in Customer Project 1. It was, however, fading throughout the period analyzed. In the research data, individual comments were heard, but they no longer had a say in Customer Project 2. This supports the notion on networks and networking as a radically new type of collaboration that cannot be explained merely as an expansion of the market- and hierarchy-driven interfirm relationships. Out of the firm-network tension, represented by the confrontation between the lower-plane and the upper-plane models (arrow 1), the middle-plane model emerged, which coincided with the emergence of early forms of partnerships of subnetworks. The focal tension re-emerged between the middle-plane and the upper-plane models (arrow 2).

The Club originated from upper-plane claims on contemporary networking. This mode of ideas was very persistent throughout the trajectories analyzed, notwithstanding the fact that it turned out to be problematic and it did not measure up to the business reality the members were acting in. To take the upper-plane model as the object of learning and a potential model for project activity, the members would have needed to reflect on two aspects of “non-communi-



cation” in Customer Project 2: that the members of the Production Group and the Design Group had not actually communicated directly before handing in preliminary offers, and that they did not communicate after the joint meeting discussion, before continuing negotiations with Customer 2. Following the emerging middle-plane model, the members did not find these actions useful.

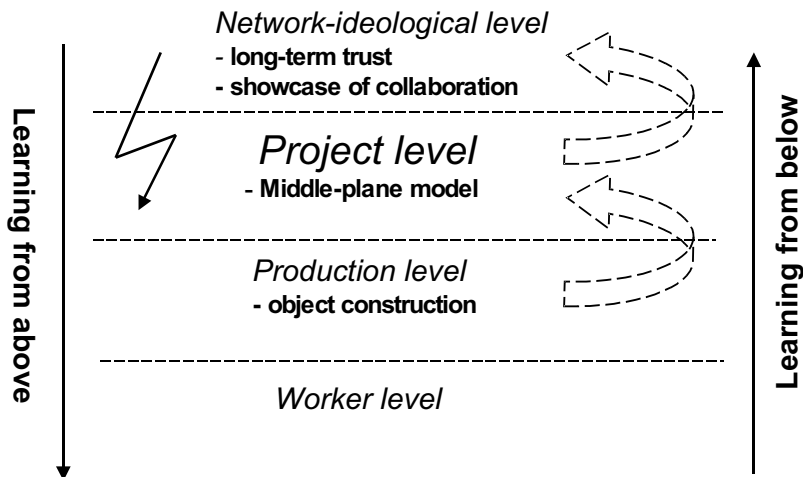


**Figure 6.2** Learning at the project level of collaboration by modeling the project activity: from lower-plane to upper-plane to middle-plane

The model-in-action was the middle-plane model, which meant that the project activity was carried out by subnetworks and partnerships of firms formed around novel objects of collaboration. It would be misleading to conceive the middle-plane model as a flat compromise between the “old-fashion” lower-plane and the “visionary” upper-plane model. The upper-plane model, even though expansive from the point of view of the Club members, turned out to be “egocentric” in reaching towards customers. *The results of both customer cases analyzed suggest that it was the middle-plane that was expansive in relation with customers. It genuinely represented the created new activity, transcending the limits of the given new activity (Engeström, 1987) of the upper-level approach.*

I will close this analysis by hypothesizing on learning dynamics reaching across the levels of the framework of my study (Figure 6.3). First, I suggest that, in the process of constructing the model, the project level was drawing more and more from the objects created at the production level. This implies that *on the production level something new was emerging besides the firm-centered lower-plane activities. This new was obviously incorporated with the activity of the subnetworks and partnership relations.*

Second, the project level acted as an intermediary, transferring the knowledge gained by the subnetworks to the showcase material of the ideological level (Figure 6.3). Inarticulate and tacit as this process was, it is questionable to extend the learning outcomes to the Club as a whole. I would rather claim that the project-level learning addressed the emerging subnetworks and partnerships of various kinds. Simultaneously, it seemed that the nature of the Club association as an ideological network was gaining in strength. This is supported by the fact that, after the closure of Customer Project 2, members organized a network-wide discussion of the values of the Club, instead of finalizing the model for the project activity.



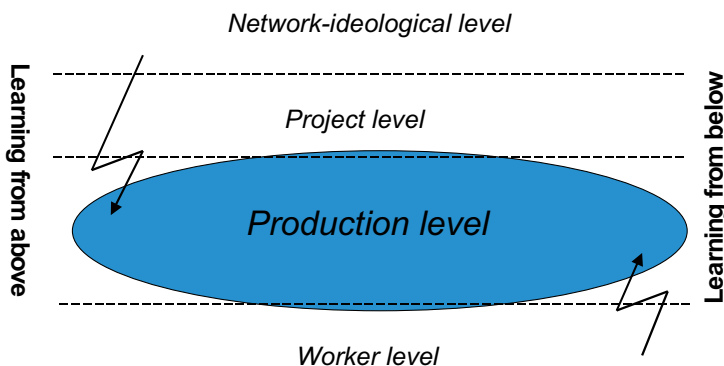
**Figure 6.3** Hypothesis 1 on learning across the levels of collaboration



## 7 Trust-in-Time? Learning to Manage Collaborative Production

### 7.1 Introduction

Chapter 6 revealed the process of constructing a middle-plane model for collaboration in the frame of the Club. The starting point of that model, as suggested both by the members and by the researcher, was in the collaborative production projects carried out by sub-networks of two or three member firms of the Club. The problem was that these projects remained invisible for the rest of the Club. There was no practice of sharing the experiences and learning outcomes gained from the application of the Club collaboration. This chapter deals with one of those projects in order to explore what the learning outcomes and challenges might have been at the *production level* of collaboration (Figure 7.1). The analysis is made mainly from the point of view of one member firm of the Club, called Firm Alpha, and its key actor, the Project Manager.



**Figure 7.1** Production level of collaboration as space for learning challenges

A crucial issue in the case discussed was the quest for trust associated with collaboration. My assumption was that, due to the Club background, problems occur-

ring in the project would be more readily labeled as trust issues than would have been the case in ordinary business contacts. But could the trust and commitment generated at the network-ideological level be transferred to the production level? The research question of this chapter deals with this issue: *What is the role of trust and its contribution to learning in a complex production process run in a network?*

The process in question was concerned with removing oil from a sunken vessel in 1996. The project dated back to the application phase of the Club collaboration that provoked the trust-related tension (See Figure 5.2). The complexity of the production stemmed not only from the technological requirements but also from the strict time constraints set by the customer. Learning was associated with the capability of managing the project distributed in a sub-network of collaboration. Trust as a time-related attribute of collaboration (Dodgson, 1993; Meyerson et al., 1996) and as a manifest tension in this research opened a window to explore the learning challenge in this context.

To avoid treating trust as a purely psychological category, I will search for conceptions of trust embedded in the social and material conditions of collaboration. The title of this chapter suggests that trust might be equated with the components of production in the Just-in-Time management, in which companies do not obtain stocks of components until they are actually needed (Bannock et al., 1992, p. 238). Besides the nice play on words, the notion of Trust-in-Time is supported by the fact that Just-in-Time was widely adopted by computer systems firms in Silicon Valley during the 1980s as being supportive to trust-related issues, such as long-term supplier relationships and confidential information sharing (Saxenian, 1991).

The chapter is structured to discuss, first, in Section 7.2, the concept of trust in relation to time and production. Methods and data are presented in Section 7.3. The object of collaboration, the oil-removing project, and the associated sub-network formation are explained in Section 7.4. Trust building and object construction are brought together in the analysis of Section 7.5. Section 7.6 concludes the chapter by discussing the research outcomes in terms of trust and learning. As an epilogue, I have given voice to the Project Manager of the case. As a manager-member of the Club, he articulated the meaning and benefits of belonging to the Club network. The reflection took place in an interview I organized as research feedback offered to the Project Manager.

## **7.2 Conceptualizing trust**

Longevity of interorganizational relationships, with long-term commitment by the counterparts, is most often seen as a precondition for trust (Dodgson, 1993). Lately, new perspectives and conceptions have appeared which point to the fact that col-

laborative work is oftentimes done in conditions of spatially and temporally unstable, constantly changing groups and settings (Meyerson et al., 1996; Engeström et al., 1999). In temporary group settings, there is no time for confidence-building activities that contribute to the development and maintenance of trust in more traditional, enduring forms of organization (Meyerson et al., 1996, p. 167). Trust is involved in temporary groups and organizations, the authors claim, but in a form that they call “swift trust.” Furthermore, the authors end up suggesting a cognitive and action-based view rather than an interpersonal one.

The portrait we have drawn of swift trust in temporary systems may be a little too “cool” for some people’s taste. There is less emphasis on feeling, commitment, and exchange and more on action, cognition, the nature of network and labor pool, and avoidance of personal disclosure, contextual cues, modest dependency, and heavy absorption in the task (Meyerson et al., 1996, p. 191).

Having aroused attention in the network literature, trust has become an emblem of flexibility, a central non-contractual element of business practices (Powell, 1996). Traditionally, trust was associated with the informal aspects of an organization. The rising interest in trust and other non-contractual elements in interfirm collaboration reveals, however, that boundaries between the formal and the informal have become complicated and problematic. Multi-organizational studies have shown how even informal practices are embedded in or reinforced by institutional arrangements (Chisholm, 1989; Dodgson, 1993; Lane & Bachmann, 1996; Powell, 1996).

Social norm-based conceptions of trust miss the extent to which cooperation is buttressed by sustained contact, regular dialogue, and constant monitoring. (—) The key is that the social norms are reinforced through ongoing debate. Without mechanisms and institutions that sustain such conversations, trust does not ensue (Powell, 1996, p. 63).

Also Lane and Bachmann (1996), drawing on a neo-institutionalist perspective and on Luhmann’s systems-theoretical view, conclude that complex socio-economic systems require a reliable form of trust production which is relatively independent of individual actors’ situational preferences. They point out that conditions of partnership-based relationships vary from one industry to another, depending on “factors such as the nature of the industry, the degree of sophistication of the products and the organization of the markets in which the firms operate” (*ibid.*, p. 391).

These organizational approaches emphasize the idea of trust as materially embedded and mediated. Trust may be conceptualized and made visible in the form of contracts, documentations, and rules mediating and regulating the process of interaction.

### 7.3 Methods and data

I will confine myself to dealing with the phases involving sub-network collaboration between the Club member firms (Figure 7.3). Thus, a *trajectory* covers the design and production phases of the entire project (Table 7.1). For the analysis of trust-related tensions, I have further focused on the *design phase* that aimed at designing a special component (a flange joint) for the oil-removing equipment. The smallest unit of data is a *design episode*, bounded by turning points<sup>42</sup> in the object-construction (design of the component). Design episodes are interpreted to manifest trust-related tensions of the collaboration. In that sense, they are comparable with the discussion episodes of Chapter 6, being minimum units of data for identifying tensions. But, unlike discussion episodes, design episodes are not derived from meeting talk recordings. They are discerned from a larger set of data that was collected by shadowing and interviewing the participants of the project (see Chapter 4).

The production activity, due to its taking place in a sub-network, was the most demanding of the research objects of this study, especially in terms of proper data gathering. It did not take the form of appointed meetings and formal memos, as did the project activity analyzed in Chapter 6. Nor did it involve any developmental intervention with an opportunity to participate in the production of data from within the activities, as in the case reported in Chapter 8.

**Table 7.1** Units of data

<b>Unit of data</b>	<b>Definition</b>
<b>Trajectory</b>	Lifecycle of a production project within the sub-network of the Club
<b>Phase</b>	Design phase addressing the trust-related tension, bounded by the design process of a component (flange joint) as the object of collaboration between the Club firms
<b>Design episode</b>	Design of the component as the object of situated exchange bounded by turning points in the object-construction: <ol style="list-style-type: none"> <li>1) First design</li> <li>2) Encountering the problems of design</li> <li>3) Second design</li> </ol>

<sup>42</sup> A *turning point* was defined in Chapter 4 as a point of discussion leading to widening or narrowing of the object of collaboration.

The data was gathered by means of shadowing, interviewing, and collecting written documents from the files of Firm Alpha (Table 7.2). The bulk of the data was collected during a short fieldwork period in March and April 1996. I joined the project after it had begun, and the most intensive phase was about to end within a few weeks. Table 7.2 reveals the data collection methods used, the contents of data from which the trajectory and the design episodes are derived, and the time span of the data collection.

The shadowing data consists of video and audio-taped material on collaborative situations, mainly during the manufacture of the central object, the flanges. Shadowing also gave me insight into the design issues, augmented by on-line interviews.

Interviews were conducted during the project or soon after the closure of the project. All key participants involved in the design episodes were interviewed once. I conducted three interviews with the Project Manager of Alpha, at the beginning of the project, and twice after the project. The first after-the-project interview served as a minor intervention, offering feedback to the Project Manager.

**Table 7.2** Data collection at production level

<b>Source of data</b>	<b>Contents of data</b>	<b>Time span</b>
1 Shadowing: Video- and audio-taped material, on-line interviews	Collaboration within the sub-network focused on the design and manufacture of the flange joint: Design meeting between Project Manager, Expert, and Production Manager D; manufacturing at site of D; assembling at site of Alpha	March – April 1996
2 Interviews: Audio-taped semi-structured interviews	Perspectives on the project and problems of design: Key actors of Firm Alpha and its partner firms A, C1, C2, C3 and D	February – November 1996
3 Archives: Written materials	Files of Firm Alpha presenting the technology used in the project Newspaper articles on the project	1996



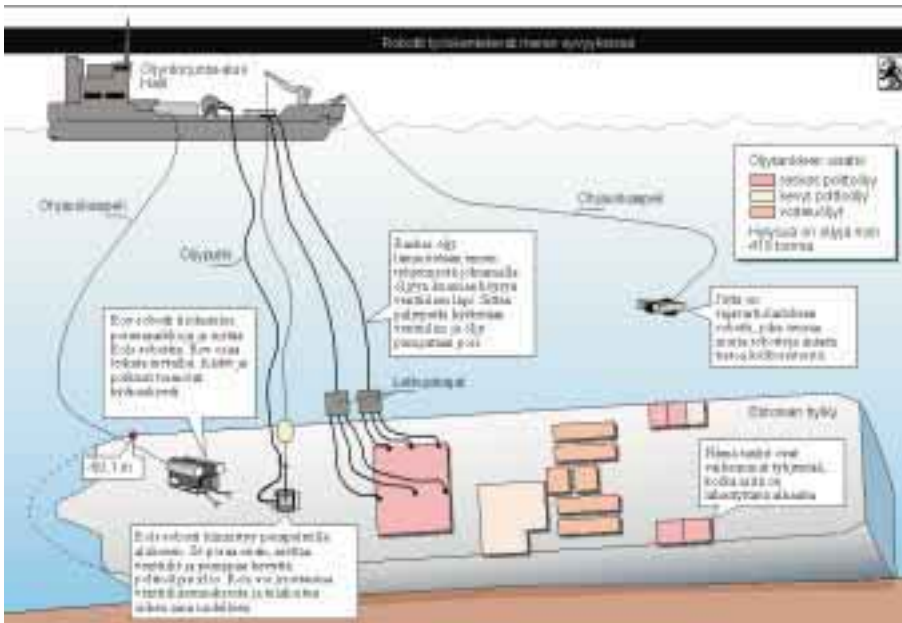
The written material consisted mainly of presentations of oil-removing techniques. Access was allowed to design documents and blueprints of the flange joint during the project, but I was not allowed to display them in this research report. I have also drawn on newspaper articles concerned with the project as it aroused considerable public interest.

#### **7.4 Oil-removing project as object of collaboration**

At the beginning of 1996, Firm Alpha received an order from the Finnish Environment Institute to recover heavy fuel oil from a large vessel sunk in the Baltic Sea in 1994. The firm was specialized in collecting and moving materials by utilizing vacuum power. Oil suction from shipwrecks and sunken vessels was one of its know-how areas. Pumping oil from about 80 meters under the water surface was something “that had never been done before,” as the people in Firm Alpha claimed.

This time we had to work much deeper [underwater] in even more exacting conditions than before. So we had to thoroughly think through the technical details (-). We had to design new solutions, if not for every piece of machinery, for the most part, in any case. (*Project Manager 08/96*)

In addition to the technical demands of the project, the time schedule was strict. There were plans to cover the wreck with concrete soon after the oil removal, in order to protect it against intruders and to prevent further environmental pollution. Two Norwegian companies were responsible for removing the diesel and lubrication oil and for the robot technology that substituted for human divers. The Finnish parties were the Navy, with two oil-recovery vessels, and the Border Patrol establishment (Figure 7.2).



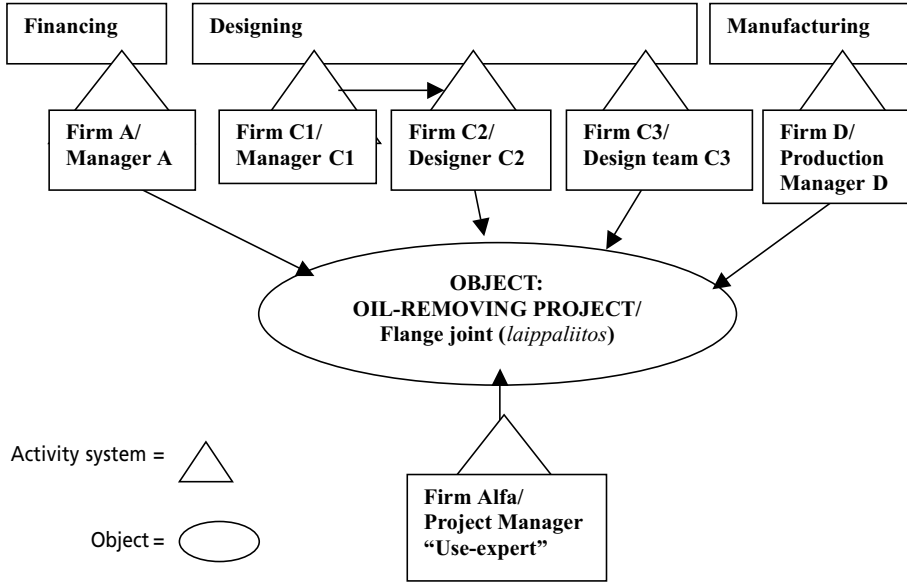
The picture is titled "Robots are working in the depths of the sea." Two objects on the left side (Rov and Rols) and one on the right side (Jutta) are robots. The technology for removing the heavy fuel oil is shown in the middle of the picture.

**Figure 7.2** The object of collaboration and contributing technology (Source: Helsingin Sanomat, April 12, 1996)

Firm Alpha was a relatively young company consisting of nine workers. The order from the Finnish Environment Institute meant a considerable expansion in its activity. Success in this project would promote its future business and bring in new orders from the global market. As an engineering firm, Alpha had no manufacturing production of its own. It was characteristic to Firm Alpha’s activity to utilize a broad range of subcontractors.

The project manager of Firm Alpha saw this case as an opportunity to mobilize the Club network in a determined fashion. He contacted the Club partners and gradually built up a sub-network where three Club firms were involved, contributing to an essential part of the project (Figure 7.3). Manager A provided the capital; Manager C1 arranged engineering design resources from subsidiary firms C2 and C3. This was the first time that Firm Alpha turned to another engineering company for design services. Firm D manufactured the newly designed components for the oil removing equipment. Outside the Club, Firm Alpha mobilized about twenty suppliers and subcontractors for components, sheet-metal work, and steelwork welding. The learning challenge in the project, actually, was how to construct and manage the entire oil-removing network. This

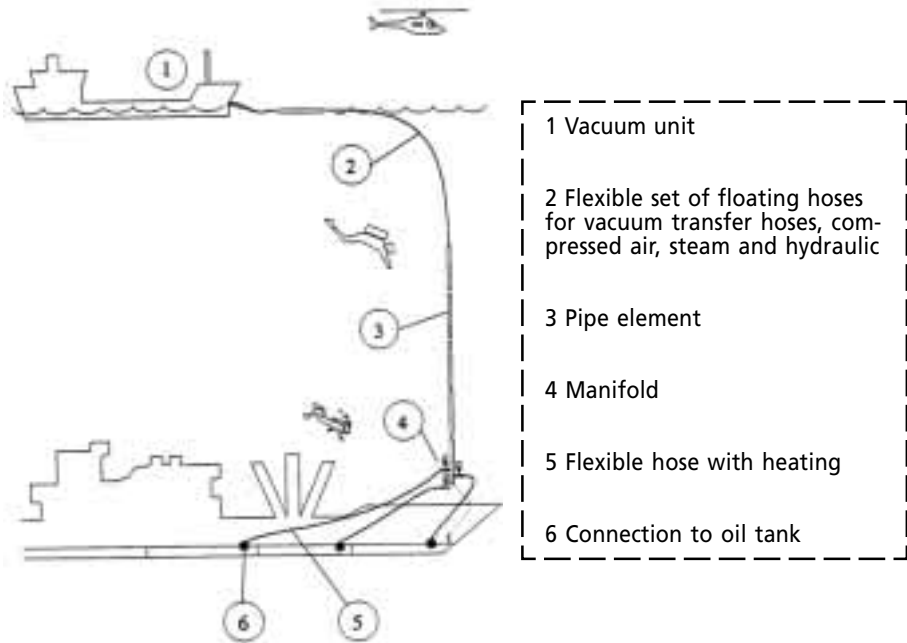
comprised not only the partners in the design and production, but also other partners providing complementary technology to and participating in the oil-removing operation.



**Figure 7.3** The sub-network of Club partners in the oil-removing project

Networking took place under great time pressure, as already mentioned. Firm Alpha did not even have time to arrange competitive biddings. All manager-level partners, the project manager of Alpha included, claimed that the interpersonal trust and flexibility of networking at this phase was based directly on the partners' commitment to the Club membership and collaboration. The partners were ready to start the work before the completion of formal contracts, without knowing the scope of the work or other details of the project.

The main object among the Club firms was the design and manufacture of the components for a flange joint. It is an important part of the oil-pumping system. It is used to connect the elements of oil-suction pipes between the suction unit top of the water and the target (Figure 7.4).



**Figure 7.4** The leading principle of unloading oil tanks by Firm Alpha's suction technique (from Alpha's brochure)

The flange connections have to meet many technical requirements: they must be tight to prevent oil from leaking into the sea, and they must be easy to handle and maintain in the unsettled conditions on the sea. The call for a new design for a flange joint originally came from the customer, who demanded an entire set of hoses (steam, compressed air, and hydraulic) connected through one and the same joint. Principally, the technical solution for each joint was a pair of flanges, which were connected together (Figure 7.5).



There were many novelties characterizing the project, such as:

- special requirements of the object: the wreck and oil removing
- use of robot technology instead of divers in the underwater operations
- use of outside engineering designers (instead of Alpha's own resources)
- new design of the flange joint, according to the customer's requirements

**Figure 7.5** Assembling the flange joint for the oil-removing machinery

The problems and problem solving during the design of the flange joint made the challenges of collaboration and learning visible to a researcher's eye. These components comprised a partial object of the project passing through many changes during the process: from a plan to a finished product, from the main object of work to a tool being used in the construction and use of the final machinery. Characteristic to the work accomplished in a network, the flange joint brought together the multiple perspectives of the actors. In this sense, it resembled the idea of a boundary object, as put forth in Chapter 2. How did the design of the component work as a boundary object, in other words, to what extent did it provide a basis for collaboration and trust building?

The preconditions for trust in the context of this specific project resembled the overall conditions of work carried out in constellations characterized as “co-configuration” and “knotworking.” The concept of co-configuration (Victor and Boynton, 1998) was presented earlier, in Chapter 3, when formulating the historical hypothesis of the zone of proximal development of interfirm collaboration. Product-oriented co-configuration differs from preceding work types (craft, mass production, process enhancement, and mass customization), also in terms of trust creation. Thus, the materially-embedded view on trust, as discussed in Section 7.2, ought to be expanded to cover the product as well as the actors and mediating artifacts of collaboration.

The notion of knotworking (Engeström, Engeström & Vähäaho, 1999) contributes to the historical analysis of work by articulating how co-configuration work is accomplished practically in organizations. It points at the qualities and requirements of collaboration and boundary-crossing situations oriented towards the emergent and complex object of work. During a single production

project, knots are tied and untied. Knotworking situations come close to the conditions of swift trust discussed in Section 7.2.

The notion of knot refers to a rapidly pulsating, distributed and partially improvised orchestration of collaborative performance between otherwise loosely connected actors and activity systems (Engeström Y., Engeström R. & Vähäaho 1999, p. 346).

Knotworking situations are fragile because they rely on fast accomplishment of intersubjective understanding, distributed control and coordinated action between actors who otherwise have relatively little to do with each other (Engeström, Engeström & Vähäaho 1999, p. 362).

## 7.5 Problems of collaborative design

When researching the project in question, I heard about a problem in the design of the flange joint. Many of the network parties were involved in the issue. I wondered whether a closer look at the problem could give a hint of the collaborative challenges in the production process. The design process was nearly over when I joined the project. From the accounts given by the participants, I reconstructed three subsequent design episodes: 1) First design, 2) encountering the problems of the design, and 3) second design.

### Design episode 1: First design

The start-up meeting of the oil-removing project gathered the different parties together. Collaboration with the Norwegian partners made English the language of communication. It turned out that Designer C2, who was recruited to the project by Club Member C1, was not used to working in an English-speaking environment. According to the Project Manager, this was the reason for restricting the contribution of this designer to a smaller task area than first planned.

#### *Excerpt 7.1*

*Project Manager:* Initially, we planned to take this engineering company as one of our negotiators with our partners (-), because we were already then aware of the troubles with the time schedule. Had we been able to create a good relationship with this engineering company right from the beginning, as we wished to, it would have helped us a lot. (08/96)

Because of the minor role of Engineering Firm C2 in the sub-network, collaboration was limited to include only a single component to be designed. Interaction, as described by the Project Manager, seemed to take the form of unilateral informing, a far cry from the ideal of co-configuration.

*Excerpt 7.2*

*Project Manager:* We said we wanted a compact package, but that pattern of thought just didn't work out. We had so many other things to do that we had no time to think about it too much. We just said, "Okay, it seems to be all right, but go on and let's see first what the final outcome looks like." But he said, "I can't do it unless all the details are clear to me." "Okay, do as you like." And as soon as we started to discuss millimeters and one tenths and hundredths of millimeters, it simply didn't work. (08/96)

Problems were accumulating at the interface between the project management and the design work. The main parties of the interface were, on one side, Designer C2, and, on the other side, the Project Manager together with the "use-expert" who consulted Firm Alfa in submarine projects. The partners on both sides experienced apparent difficulties in figuring out each other's work, with an accompanying suspicion about the competency of the partner in the process.

*Excerpt 7.3*

*Designer C2:* When we started the project, they didn't have a clear image of what they wanted. And, then, I received information piece by piece, and every time you designed some part in the way they wanted it to be, then, again, they wanted to change it. They don't possess expertise in the engine shop production, and there was a contact person involved who didn't have the slightest idea about it. He was probably a diver by profession whom they needed in that project (//). (08/96)

*Excerpt 7.4*

*Expert:* In cooperation, [the problem was that] when we asked for some information, we received only a piece, some picture that was only a part of the design. Never a complete picture of the thing.

*Project Manager:* He never gave us the forest, only trees.

*Expert:* It may have been a fine part, but what was it for? That was the problem, and when we finally got the complete picture, we were already in a hurry.

(//)

*Project Manager:* In a project like this, it is the people with practice that fit in best; they know and are able to design the machinery which will work in the long run. Not the engineers, for they have their own kind of education that their eyes are fixed upon, and that's it. (03/96)

The partners' views on the specifications of the design seemed to differ considerably. The designer emphasized the high qualifications (tolerances etc.) to be produced by the advanced technology available in the engineering shops. Once well designed and made, the product would be faster and cheaper to use in the long run. He saw a contradiction between designing objects of a high technical quality and the users' search for standard parts and simple solutions. The Production Manager and the consulting expert related the design to the use situation at sea, with primitive technological conditions far from engineering shops. Standard components would be easily and cheaply replaceable and renewed if needed. A simple and rough design was preferred regarding the potential adjustments at the installation phase, which would be accomplished by "handwork" instead of CNC machines.

## Design episode 2: Encountering the problems of design

Despite the technical problems of the design and the growing lack of trust between the partners, Designer C2 completed his work. The Project Manager brought the design documents to the manufacturing firm asking Production Manager D to submit an offer, including the total costs of making the components. This was a turning point that made the problems of the design visible and urgent.

### *Excerpt 7.5*

*Production Manager D:* I visited [Alpha's office] and handed over my offer, including the estimation on what the production of these parts would cost. And, at that phase, [the Project Manager of Alpha] said that something was wrong, as the costs exceeded the entire budget. They started to check the design and found out that it was too complicated, consisting of too many parts, which accrued the expenses. (03/96)

The problem with the design was that a great number of the parts - several hundreds in total - were to be produced by machining, which was costly and time



consuming. This made the Project Manager turn to the other designing firm, C3, for a resolution of the acute problem.

It is easy to point out that “money talked” at this turning point, referring to the fact that the design process with Designer C2 had not been stopped until the financial costs became apparent. The preceding controversy over technical details could not alone stop the process. Nevertheless, even more important in the context of this analysis is the notion that *the problem was not articulated until the third partner, representing the next stage of production, had contributed to the design when calculating the manufacturing costs and time.*

### Design episode 3: Second design

When visiting Firm C3, that also supplied the project with design work, the Project Manager explained the design problem of the flange joint that needed an urgent solution. This was the second major turning point of the design process. During the discussion that followed, the Project Manager, Manager C3 and a couple of designers generated a new technical solution, and the design work started right after the meeting. The problem and its solution were sketched on a white board. The Project Manager did not bring Designer C2’s drawings with him. Afterwards, Designer C2 sent these to Firm C3 and some elements of them were even utilized in the new design. The interaction between the Project Manager, the Expert and Design Team C3 (Manager and two design engineers) was considered good, including the communication between Design Firm C3 and the manufacturing company, Firm C.

The contrast to Designer C2 working in relative isolation was apparent. I asked the manager and a designer in Firm C3 whether they had got an overall picture of the final product and its technical requirements before starting the design. Unlike Designer C2, Designer C3 did not emphasize the technical precision but defined the starting situation rather loosely<sup>43</sup>.

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<sup>43</sup> Excerpts 7.6 and 7.7 derive from an interview with the Manager and Designer of B3. Note that the interviewees were not asked to compare the first design by B2 with their own design. Design Episodes 1 and 2 were not touched on, at all, in this interview. The interviewees did not yet know that I was aware of the existence of the first design, and they were apparently cautious not to mention it. As the project was still running, I was cautious, as well, not to interfere too much. After the project, I asked Manager B3 complementary questions about the design episodes.

*Excerpt 7.6*

*Designer C3:* As far as I could see, I knew the system in general terms, what kind of fuel was going to be removed, namely. I knew what kinds of machines there were (-) and about the hosing system (-), which showed how the recovery should be accomplished. Actually, I didn't need any more information. That was enough for me. (04/96)

Learning from the problems of the first design, the leading principle of the solution, simplicity, was now emphasized by the Project Manager. The practical solutions evolved gradually; the manager and designer of Firm C3 did not see changes as counteracting collaboration. The same features of communication, experienced as problematic during the first design, were now seen as part of normal project work.

*Excerpt 7.7*

*Designer C3:* Well, we ended up with a bunch of pictures about the flanges, certainly over ten pictures, about left and right-handed positions and different kinds of (-). And various drafts - of course a project is always fluid in the beginning - so we got many drafts before it found its shape. The flange was obviously the right shape from the very start, but the positions of the holes had to be changed.

(//)

*Manager C3:* They came over; we had meetings and discussed how we could improve it, what needs to be added, what is missing... (04/96)

*Excerpt 7.8*

*Project Manager:* They bestowed surplus value on this product, in Firm C3. They offered ideas and solutions. Even if in some cases we had to say to them, too, that it's no good, they understood it. They might have said, "Okay, let's see," and they would listen to us. And they said they now understood why. We couldn't reach that kind of cooperation with Firm C2. (//) In Firm C3, the managing director always attended the most important meetings. (08/96)

Designs 1 and 2 are compared in Table 7.3, in terms of the differences in the number of parts needed for one joint and the amount of machined parts to be made in an engineering shop. According to the Project Manager, there were 28

joints in total. Because of the number of machined parts, the costs of Design 1 would have been a good three times higher than those of Design 2. The superiority of Design 2 also became evident in terms of the working hours of the machining, the usability of the components, and the weight of the whole system.

**Table 7.3** Design 1 and Design 2 in comparison

<b>One flange joint</b>	<b>Design 1</b>	<b>Design 2</b>
- parts, total	160	70
- machined parts	90	4

All in all, Design 2 met the requirements: it was simple enough to produce and use, it utilized mostly stock goods, and the costs of production were within the limits of the budget. All these criteria were known to the project management of Firm Alpha from the very beginning of the project. As the brief presentation of the design episodes shows, the articulation and translation of these specifications to the partners and to the final outcome was a multifaceted and complicated process.

## 7.6 Conclusion

This chapter demonstrated the idea of studying the material objects of collaboration, in order to gain an understanding of production-level trust and learning in interfirm networks. The research question was: *What is the role of trust and its contribution to learning in a complex production process run in a network?*

The oil-recovery project was clearly a firm-based production project but, nevertheless, it had some network-ideological connotations. The Project Manager saw the oil-removing case as an opportunity to mobilize the collaborative advantage (Huxham, 1996) of the Club, which gave the firm credibility in the eyes of the customer in the competitive bidding. He was aware of the discussions and attempts at creating a joint business within the frame of the Club (Chapter 6) and, keeping that in mind, he invited a network researcher to follow the project, despite the uncertainties and pressures involved. I had earlier expressed my interest in participating in a project demonstrating Club collaboration. The importance of the network-ideological level cooperation became evident at the beginning of the project, with the Project Manager drawing on the Club membership when contacting managers A and C1 and Production Manager D.

Throughout the project, he relied heavily on the trust and commitment created within the Club.

The problematic design process of the flange joint revealed some interesting features of cooperation. Participants themselves are often tempted to explain these kinds of problems and their successful solution in terms of interpersonal trust, the “chemistry” of human relationships. I see that kind of trust as a network-ideological level concept ensuing gradually in the course of time, for instance, in the membership of the Club. So understood trust-based network is taken for granted and resorted to when needed. This is consistent with the way the Project Manager drew on the Club members when forming the sub-network.

But as the case revealed, *network-ideological trust-in-time is fragile and exposed to failure in the production activity within a sub-network*. The limits of ideological-level trust, based on long-term commitment, became visible as soon as participants outside the Club membership became involved in the project. In the interaction between the Expert and Designer C2, both relatively unaware of the Club context, trust had to be built “in action” during the course of the design process. In rapidly organized production activities where, as Meyerson et al. (1996) argue, swift trust should emerge, it is actually the object and the intensity of object-orientation that organize collaboration. It also provides mutual consideration in interaction, in line with “the heavy absorption in the task” (Meyerson et al., 1996, p. 191).

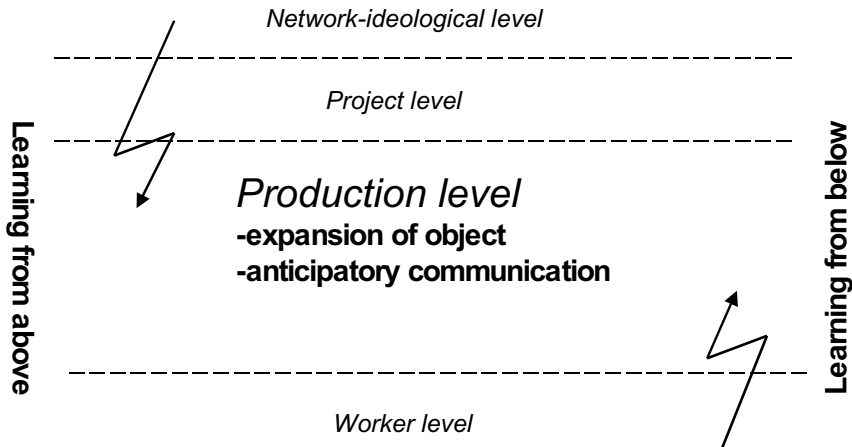
Even the swift trust, based on advanced professional skills of autonomous participants, proved to be problematic. The design of a flange joint, being done in isolation from the rest of the project organization, offered a rather narrow basis for that kind of action. *The object was too fragmented to generate absorption and swift trust by the participants*.

As such, the object of collaboration worked poorly as a boundary object, mediating perspectives and meanings. It was rather a “bounded object” providing limiting conditions for co-configuration and knotworking. Instead of joint object construction, each party kept to their distinct know-how areas, even over-emphasizing the qualities stemming from their own professional expertise. The interaction produced low use-value that materialized in the design outcome being technically too complicated and economically too costly to be implemented. The first turning point, leading to the realization of the problems, meant a narrowing of the object from the point of view of Designer C2. The interaction within the sub-network was not expansive; on the contrary, it collapsed and hindered learning.

*I conclude that swift trust and expansion of the object presuppose each other in the sub-network production collaboration*. The second turning point and successful design of the flange joint can thus be understood in terms of expanded object

creation and the realization of co-configuration and knotworking. A living, growing sub-network evolved, based on the ongoing relationship between the customer (Alpha in this case), the product, and the engineering and manufacturing companies (Victor & Boynton, 1998). Work was carried out dialogically, by exchanging know-how (Excerpts 7.7 and 7.8), not by means of unilateral messages. Having designed together other parts before the flange joint, the designers had a broader view of the oil-removing project. Simplicity as the most important use value materialized in the final product.

Connecting trust creation with object construction opens up new viewpoints on trust in sub-networks. One of them is the notion of *anticipatory communication*, that obviously was absent from the first design, but was brought up by the second one as the mode of communication between the designer and the manufacturing firm. Anticipatory communication implies at least two dimensions of expansion, namely those of *social-spatial* and *anticipatory-temporal* (Engeström, 2001b; Hasu, 2000b). The former addresses the various participants and perspectives that should be included in the production process. The latter considers previous and forthcoming steps of the process, challenging actors to broaden the temporal perspectives of the step at hand.

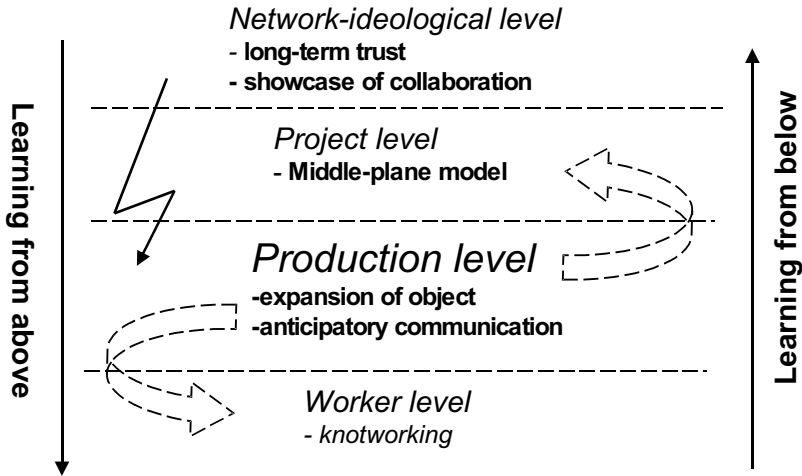


**Figure 7.6** Learning at the production level of collaboration

Figure 7.6 summarizes how I conceptualize learning at the production level of collaboration. The analysis highlighted the expansion of object and anticipatory communication as virtues of collaboration.

The second hypothesis on learning across the levels may now be elaborated. Both the problematic and the successful design episode showed that production-level collaboration is closely connected to the worker-level capabilities of con-

structuring objects of production, which was discussed in terms of knotworking (Figure 7.7; arrow pointing from the production to the worker level).



**Figure 7.7** Hypothesis 2 on learning across the levels of collaboration

The analysis further revealed that the network-ideological level trust was not easily transferable to the production level. It is true that the rapid solution to the design problem revealed the flexibility of the Club, drawing, to some extent, on the network-ideological collaboration. The solution, however, was highly improvised and the problematic design episode was considered a slip in the project. There were no principles or models that could be followed in a problem situation.

The arrow from the production level up to the project level (Figure 7.7) derives from the analysis of Chapter 6, in which it was suggested that the middle-plane model drew on the production collaboration among the Club firms. The oil-removing case showed that the production-level practices were not reciprocally supported from above, but created from below, project by project. *It seems that, in the application phase of the Club collaboration, the production level and the project level were pulling further apart from each other.* The analysis of Chapter 8, addressing the emergence of worker level collaboration and learning in the context of the Alliance, will cast light on this strand of development.

## 7.7 Reflection: The benefits of networking

I have followed one special case of interorganizational collaboration, seeking to understand and analyze it from the point of view of learning and trust. Now it is time to address a very practical question that is often put to the actors of the Club as well as to the researcher: What was the real benefit the firm gained from networking with other Club firms, compared with more traditional kinds of business relationships? After all, to be worth striving for, should collaboration not bring some additional value to the firms, measured in economic terms? There is definitely no single answer to this, as Sydow and Windeler (1998) put it.

Hence, it comes as no surprise that researchers, when assessing the effectiveness of interfirm networks at all, prefer to stick to single, highly selective and somewhat arbitrary measures; and that managers often feel too much is asked of them when it comes to evaluating network practices or even entire networks (Sydow & Windeler, 1998, p. 273).

My “mini-intervention” at the production level of analysis consisted of researcher feedback and the accompanying interview with the Project Manager, carried out after the oil-removing project. The interview offered the Project Manager an opportunity to reflect for a while on the benefits of networking. He articulated his personal sense of networking as follows:

All firms have networks of their own. The Club is only one among many others. If it is maintained by force, it will not work. One must find the real seed of the collaboration, and strive to gain results. For me personally, the Club has given a lot. I have made good contacts. I have had good conversations with different people. I have had a chance to join good projects, I mean development projects (Project Manager 08/96).

The comments about the benefits in the oil-removing project refer to the discussions on the model of the Club’s project activity (Chapter 6). Like the advocates of the middle-plane model, the Project Manager was not willing to give the Club a coordinator role in production projects. He saw the Club as a contact interface serving the member firms.

We do not need the Club to start this kind of a project. What we need are the contacts offered by the Club. Or, the contacts offered by the Club make it possible to carry out these kinds of projects. But we who use the Club must find those [partner] firms on our own. I don’t think the co-

ordinator of the Club can manage these things. For example, as we got the oil-removing project, I would have liked to share it among a larger number of Club firms, but I couldn't. I shared what I could and it was okay. It was enough. After all, the Club firms got several hundreds of thousands of marks out of this project alone ( Project Manager 08/96).

Concerning future benefits, the Project Manger expected the Club-type networking to support the production activity of the firms. The aim of involving the personnel of the member firms in the Club activities had been put forth in member meetings (Chapter 5), but here the Project Manager argued more radically that the responsibility for running activities should be handed over from managers to employees.

In our sector, international networks are being utilized extensively. Our firm [is using them] in marketing, partly in production, and [international networking] is expanding rapidly all the time. It will become a trend, whereas in the domestic arena, networks will remain mainly on the production side. And, therefore, it is the production personnel that should run the Club activities. The top management could then participate on some occasions. The Club collaboration should be rooted deeper in the organization. I think training is one way to get these people involved and acquainted with each other. ( Project Manager 08/96)

The benefits of networking can thus be looked at from many angles. First, in regard to personal benefits, the Project Manager emphasized non-economic, scarcely measurable outcomes, such as contacts, discussions, and development projects.

Secondly, when defining gains in economic terms, the Project Manager referred to the benefit for all participant Club firms. Thus, the initial question about the benefit coming to one single firm turned out to be too narrow. This is quite a typical situation in network studies: we deal with new and complex collaborative issues, but evaluate them with old individualistic or firm-centered measures (Sydow & Windeler, 1998).

Finally, the Project Manager addressed the production level. Contrary to traditional business interactions, he supported the direct collaboration of the production people across the firms. In the frame of the Club, this could be initiated through interfirm training projects. All in all, the Project Manager suggested that the focus of collaboration should shift from the management level to the production level, and, therefore, to the worker level. This leads to questions concerning the zone of proximal development that are addressed in the next chapter.

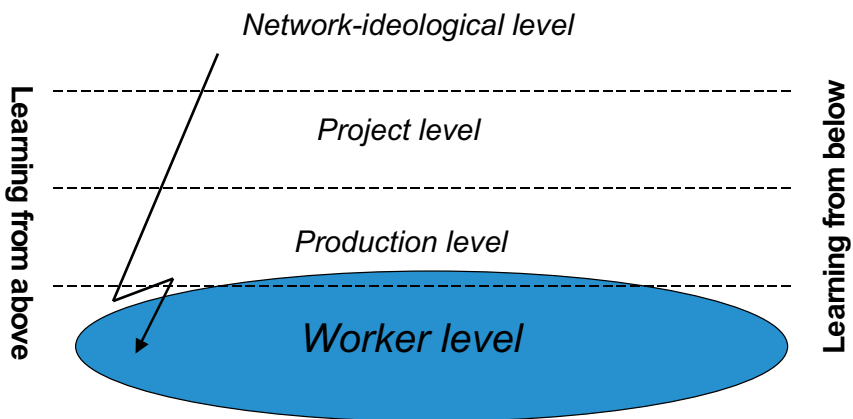




## 8 Bringing Worker Perspective into Interorganizational Collaboration and Learning

### 8.1 Introduction: The missing perspective

This chapter deals with the zone of proximal development of the Club network. As an outcome of the historical analysis of Chapter 5, the zone was defined in terms of *the emergence of the worker level of collaboration and learning* associated with the decentralization of the Club-collaboration into partnership-type sub-networks (Figure 8.1). The sub-network addressed here is that of the *Alliance* developed by Manager A and Manager B, who were central initiators of the Club as well. The transition from the ideal-typical network of the Club towards the more focused and object-oriented sub-networks actually could be observed through the actions of these key members. The sub-networks brought showcases for the Club, but, evidently, the transition also absorbed resources from the joint member activities.



**Figure 8.1** Worker level of collaboration as space for learning challenges

The emergence of the worker level appeared as a hypothesis to be tested. We<sup>44</sup> carried out a developmental intervention aimed at strengthening workers' participation in the network context. In terms of the theoretical model of the *levels*, this allowed me to study how learning is transferred across them, and, specifically, to what extent the worker perspective will permeate through other levels of learning and collaboration. The touchstone of the new emerging level is whether anything stable comes out of the interfirm collaboration. Is it possible for workers to create shared objects and reach well-established collaborative practices in partnerships?

When starting, it seemed as if we lacked examples of what intensified collaboration had to offer for ordinary, shop-floor workers in companies. In contrast to the claimed potentials of flexible work, dispersed occupational communities, and computer-mediated communication, there were still great numbers of employees in more or less traditional modes of work: tied to the machines in production with no access to computer networks and electronic mail, their daily contacts were confined to the nearest co-workers in a firm.

Besides the dominant manager perspective on interfirm collaboration, the changing work patterns of employees in distributed organizations have also been discussed. At least two types of questions have emerged in recent network research. First, what are the effects of interorganizational computer-mediated communication (and other information-mediating technology) on the work and horizontal peer-to-peer collaboration of the so-called knowledge workers and autonomous professionals (Boland & Tenkasi 1995; Orlikowski et al. 1995; Pickering & King 1995; Zetka 1998)? Second, what are the effects of network organizations on employee participation, commitment, and resistance especially in the manufacturing industry, which is today becoming more and more organized into geographically-dispersed production units (Armstrong & Cole, 1995; Koch & Buhl 1998; Leisink & Sandberg 1998; Harrison et al., 2001)? Answers to these questions are still far from conclusive.

The notion of *the missing perspective* is relevant both in the context of the Club and in regard to understanding learning in networks. By carrying out a worker-level intervention called the "Developmental Dialogue" (DD)<sup>45</sup>, we wanted to tackle both. It was organized as a subproject of the *Together-We-Are-More*

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<sup>44</sup> I collaborated with my colleague Kirsi Koistinen, the "DD leader" of the process reported in this chapter. I also acknowledge collaboration with the DD project group of the Alliance. DD stands for the Developmental- Dialogue intervention.

<sup>45</sup> Developmental Dialogue as a method of intervention is presented in Section 4.2. The evaluation of the method will remain outside the scope of this chapter.

project run by the *Alliance* (see Section 3.3)<sup>46</sup>. For a participant, the DD offers a tool, based on collaborative discourse, for defining personal developmental needs (the zone of proximal development) at work. For a researcher, the question was to what extent these needs of workers were linked with networks, and whether personal development at work could be enhanced by interfirm collaboration. This analysis is focused on the case of a worker called *Mikko* and his developmental project on *teamwork*. This chapter will address the fourth research problem: *How can interorganizational collaboration enhance the workers' needs for development and learning at work?*

I will analyze how a worker perspective first emerged in collaborative discourse across organizational boundaries. Considering a proposal for teamwork as a worker's organizational innovation, I will examine how this proposed teamwork met a worker's need for work-related development, and how it was supported by the organizational views of the management of the *Alliance*.

The concept of worker perspective is first elaborated in Section 8.2. Methods and data are presented in Section 8.3. The analysis of the collaborative discourse in Section 8.4 draws on the notion of a boundary object of collaboration, by means of which the unit of data will be defined (see Chapter 2). Here the boundary object will be the concept of "teamwork," materializing the worker perspective as well as bringing together different perspectives on networked collaboration in the frame of the *Alliance*. Section 8.4 analyzes the emergence of the worker perspective going through six phases of the teamwork project that started from the DD intervention. Conclusions and discussion on the worker perspective are presented Section 8.5.

## 8.2 Conceptualizing the worker perspective

The concept of perspective corresponds to the everyday notion of different points of view of (individual) actors. Perspective is, nevertheless, socio-culturally constructed and mediated and should therefore be regarded as of collective origin (Holland & Reeves, 1996). Boland and Tenkasi (1995) interpreted the boundary object to be a visible representation of an individual's or community's knowledge (perspective). It provides grounds for perspective-taking by others in another community in a way that enables conversation without enforcing commonly shared meanings. Addressing knowledge-intensive firms, they listed as such objects cause maps, narrative maps, models, classifications, and schemes. Practically any kind of an artifact, conceptual or material, can become a bound-

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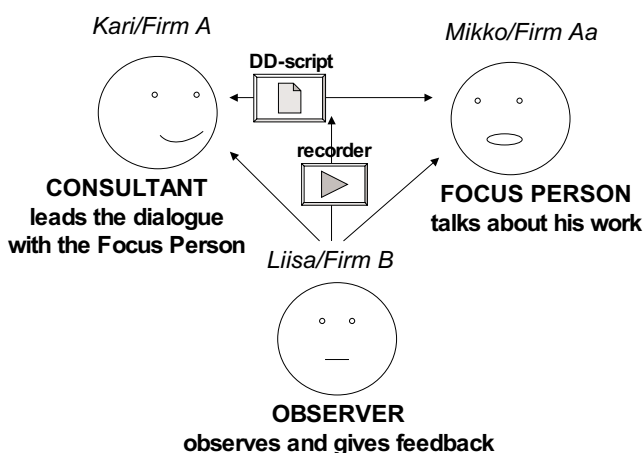
<sup>46</sup> Terms "Alliance" and "Together Project" are closely related in this analysis. Their meaning should become clear in the context of use.

ary object that mediates collaboration in the course of interaction between different parties. Even though Boland and Tenkasi emphasized mutual understanding in perspective-making and taking, they also pointed out that a boundary object can become a center of intense conflict as easily as of cooperative effort.

The concept of “teamwork” served as a boundary object in the case examined here. It was stable enough as a cultural artifact to mediate collaboration in a network. As a concept, it was culturally given but had to be re-conceptualized by the actors. Different articulations of teamwork by the actors shall manifest different perspectives across the levels of collaboration. The analysis is based on discursive data exploring how and what participants talked about teams and teamwork.

In activity-theoretical terms, the worker perspective is approached at the level of actions. The analysis reveals layers of actions, starting from the Developmental-Dialogue intervention that called forth further actions, such as planning and implementing teamwork in a firm. The question is how to connect the findings of the analysis with the level of collective activity in firms and in the network? Will the worker perspective and worker actions have any linkage or impact on the firm’s activity, or on the activities carried out in networks?

The worker perspective is here represented by Mikko. He was a young mechanic in a small company, Firm Aa<sup>47</sup>, in Central Finland. At the beginning of 1998, he participated in a DD process that brought together workers from five firms. He did not know most of them before. In Mikko’s small group were Liisa from Firm B and Kari from Firm A (Figure 8.2). The situation was quite specific and new to Mikko and to the rest of the group.



**Figure 8.2** Mikko’s group in the Developmental-Dialogue intervention

<sup>47</sup> Firm Aa stands for a subsidiary company of Firm A.

### 8.3 Methods and data

The units of data are similar to those in Chapter 6, namely trajectory, phases of trajectory and discussion episodes that make up a given phase (see Chapter 4). In Chapter 6, however, the units were bounded by the object of collaboration (customer cases). At the worker level, the objects of sub-network collaboration were only emerging. Therefore, I employed an intermediate boundary object, that of teamwork, to specify the units (Table 8.1).

**Table 8.1** Units of data in terms of the boundary object “teamwork”

Unit of data	Definition
<b>Trajectory</b>	The evolution of teamwork in Firm Aa from a worker’s (Mikko’s) perspective
<b>Phase</b>	Focus (context and meaning) of teamwork in a given period, bounded by the shifts of focus Six phases, from seeking a personal developmental task for Mikko to implementing teamwork in the production of Mikko’s firm
<b>Discussion episode</b>	Teamwork in Firm Aa as a topic of a situated conversational exchange bounded by the emergence and turning points of the topic

*Trajectory* refers to the articulation and evolution of teamwork from its initial “invention” to the implementation in practice. The trajectory started from the Developmental-Dialogue intervention (DD), during which Mikko formulated teamwork to be the object of his developmental project. It ended when teamwork was implemented in production at Mikko’s workplace. Trajectory takes shape as a stepwise formation of the emerging worker perspective.

*Phases* of the trajectory are identified in terms of shifts of focus, by which I mean that the context of teamwork project changes. This refers to the social-spatial expansion (or narrowing) of the sub-network by which teamwork is developed. For example, a shift of focus takes place when Firm Aa joins the teamwork project of Firm B (Phase 5), after having developed teamwork on its own within Firm Aa (Phase 4). Phases can be partly overlapping, as is seen in phases 4, 5 and 6.

*Discussion episodes* are bounded by teamwork as the topical focus of a situated conversational exchange. A discussion episode is identified and selected out of a larger coherent set of data, such as a transcription of a meeting. A discussion episode starts when the teamwork of Firm Aa (Mikko’s firm) emerges as the topic of collaborative discourse, and it ends where another topic emerges, for example, the teams of Firm B (see Section 4.3).

Phase 1 of this process was exceptional, being an antecedent of the articulation of teamwork. Discussion episodes in Phase 1 consist of Mikko's developmental needs at work, and teamwork in Firm B, taken up by Liisa. The length of

**Table 8.2** Data collection at worker level  
A, Aa, B, AB 1, AB 2 = Alliance firms (see Table 3.1); DD = Developmental-Dialogue intervention

TRAJECTORY/ PHASE Month/year	MAIN DATA	NUMBER OF DISCUSSION EPISODES	COMPLEMENTARY DATA
<b>Phase 1: In search of a personal developmental task</b> 01/1998	Date: January 1998 Meeting: The 1 <sup>st</sup> DD session, Mikko as Focus Person Participants: DD group: Mikko/Aa, Kari/A, Liisa/B Excerpts 8.1, 8.2	5	Date: January 1998 Meeting: The 1 <sup>st</sup> DD session, Foreman Juha/Aa as Focus Person Participants: DD group: Juha/Aa, Worker/B, Worker/AB 2
	Date: January 1998 Meeting: The 1 <sup>st</sup> DD session, Liisa as Focus Person Participants: DD group: Liisa/B, Mikko/Aa, Kari/A Excerpts 8.3, 8.4	6	
<b>Phase 2: The invention of teamwork</b> 02/1998	Date: February 1998 Meeting: The 2 <sup>nd</sup> DD session, Mikko as Focus Person Participants: DD group: Mikko/Aa, Kari/A, Liisa/B Excerpts 8.5 – 8.9	5	Date: February 1998 Visit in Firm Aa: interviews with manager, foreman and nine workers, observation of work Participants: Personnel of Firm Aa and researcher
	Date: March 1998 Meeting: The 3 <sup>rd</sup> DD session, presentation of personal developmental projects Participants: DD groups together (4 → 3 persons), DD leader and researcher Excerpt 8.10	4	
<b>Phase 3: Defending the teamwork innovation</b> 03/1998	Date: March 1998 Meeting: Feedback meeting of DD Participants: Representatives of DD groups/ A – AB 2, DD leader, researcher and management of Alliance Excerpts 8.11 – 8.14	3	-
<b>Phase 4: Starting teamwork project in Firm Aa</b> 03/1998 –	Date: May 1998 Meeting: The 1 <sup>st</sup> DD follow-up Participants: DD groups (10 workers/A–AB 2), researcher and personnel manager of Alliance Excerpts 8.15, 8.16	2	Date: March 1998 and April 1998 Meetings: Management group of Together-project/Alliance Participants: Managers and personnel manager of Alliance firms, 2 consultants, researcher
<b>Phase 5: Joining the teamwork project of Firm B</b> 09/1998 -	Date: October 1998 Meeting: Teamwork project group of Alliance Participants: Managers, delegates of personnel, team trainers of B and Aa and researcher Excerpts 8.17 – 8.20	5	Date: October 1998 Visit in Firm Aa: Group discussions, interviews, observation of work Participants: Personnel of Firm Aa and researcher
<b>Phase 6: Implementing teamwork in production of Firm Aa</b> 03/1999 -	Date: August 1999 Meeting: The 2 <sup>nd</sup> DD follow-up Participants: DD group (6 workers/A-AB 2), DD leader and researcher Excerpts 8.23, 8.24	1	Date: April 1999 Meeting: Workshop of Together-project/Teamwork project group of Alliance Participants: Managers and delegates of personnel B and Aa, team trainer/B and researcher Excerpts 8.21, 8.22

a discussion episode can vary considerably. In the following analysis, long episodes are not displayed in full length, but in shorter excerpts. (Thus the number of discussion episodes in Table 8.2 is not equal to the number of excerpts used in the text.)

I gathered data during 1998 - 1999 when working as a project researcher in the *Together-We-Are-More* Project of the Alliance. This gave me an opportunity to participate in all the meetings and discussions, both in formal and informal situations. The data can be divided into main data and complementary data (Table 8.2). Researcher's field notes are included in each set of data and they are not separately mentioned in the table. The main data, consisting of meeting discussions across the boundaries of firms, Mikko always as one of the participants, were tape-recorded, transcribed and systematically analyzed, based on discussion episodes.

The complementary data was used to construct the trajectory and the phases of trajectory. I have drawn from all materials I got about the teamwork project. This also includes other workers' accounts, besides Mikko's, above all in Firm Aa. This corresponds to the idea of a perspective as a socially-constructed phenomenon (see section 8.2). Even though the worker perspective is analyzed from the point of view of Mikko, it is not conceived in individual terms evolving in social isolation.

#### **8.4 Emergence of worker perspective in interfirm collaboration**

##### **PHASE 1: IN SEARCH OF A PERSONAL DEVELOPMENTAL TASK**

The Developmental-Dialogue process was meant to bring workers from different Alliance companies together. Most of the participants did not know each other before. To get along, they started to follow the dialogue procedure, as they were asked to, in the following manner.

###### *Excerpt 8.1*

*Kari/A:* Well, the next question is about the social background, family relationships and hobbies.

*Mikko/Aa:* Social background: My dad drives a truck, mom works in the same firm as I. I have one sister and my hobbies are rink-ball, football and motor sport. That's all.

*Kari/A:* Could you describe your work history, it says "could you," so it's probably not obligatory, but let's ask it anyway.



*Mikko/Aa:* Well, my work history is still quite short. I went to work for Firm Aa in -94, -95, after military service. Before the army, I had worked there for a few months, that's why they took me back then. And before that, I had done some car mechanic work, just a little. (*DD-session 01/98*)

To be successful, the DD process should result in personal developmental tasks for the participants. The DD intervention is instrumental for reaching that purpose, not an end in itself. In Mikko's case, the participants gradually became acquainted with the DD procedure and with each other as well, and got involved in the discussion. The talk was more and more related to the work of the focus person, Mikko.

Mikko raised problems of work, came back to them and elaborated them in different parts of the dialogue. His main concern seemed to deal with the communication within the firm, especially between the workers and their superiors (the manager and the foreman). First, he claimed, one never received positive feedback from the managers. Second, it was practically impossible to suggest some improvements or new ideas to the managers. Third, projects were started but not completed; people forgot what had been agreed together.

Mikko saw the manufacture and maintenance of tools as a suitable extension of his present work with tools installation. Tools are installed in the machines to manufacture a certain product. The quality of the tools is naturally crucial for the outcome, in other words, for the quality of the product. Design, manufacture and maintenance of the tools were located outside the company, namely in the mother company, Firm A (Kari's firm), more than 400 kilometers from Firm Aa. Thus, Mikko could not communicate with the tool mechanics in the planning phase, nor could he or his colleagues take care of the maintenance work, for lack of proper instruments and skills.

#### *Excerpt 8.2*

*Kari/A:* Do you have any say in the design of the tools at all? Like could you give tips to the designer?

*Mikko/Aa:* Yes, to some degree, but the problem is that the designer is over there in your firm [mother company A]. It's difficult to give any tips over there. [Laugh.] We have practically no designers, and if we try to give tips and advice, the managers don't usually accept it, so we have given up. They themselves try to explain things to Firm A where they mainly design tools, but you can't actually do much about it by yourself.

*Kari/A:* Right, (-) in fact I know these designers rather well.

*Mikko/Aa:* It's seldom you can change those tools in [Firm Aa]. You

can grind even surfaces and the like but you can't... By milling it's very difficult, we have such an old milling machine there that you can't do anything fancy with it.

*Kari/A:* Yeah. What kind of things or what aspects of work would you like to manage better now? Should the emphasis of development be on the professional mastery of work tasks?

*Mikko/Aa:* Well, yes, with regard to that tools issue, one could basically get some kind of training. (-) If I could use more often that milling machine, (could) change them [tools] by myself a little bit, otherwise, I'm not able to develop in any remarkable way. (DD-session 01/98)

The discussion was still quite formal, following the DD procedure. None of the topics were elaborated on in the collaborative discourse, except the problem of tool maintenance. To identify the emerging boundary object of the discourse, we shall follow the procedure to the next DD round, with Liisa from Firm B as a focus person and Mikko as her consultant. In the discussion, Liisa mentioned teamwork many times. Her comments were related to the problems that Mikko had articulated before. For example, in the next excerpt, Liisa deals with the feedback in teams and in the firm, collaborative planning and improvements in teams, and the workers' possibilities to influence their work.

*Excerpt 8.3*

*Mikko/Aa:* In what direction is your work unit developing right now, and do you participate in development work?

*Liisa/B:* Well, we have tried to develop teamwork real hard, but it seems as if we took three steps forward and then eighteen steps back. It has been stuck lately. But now the teams themselves have tried to make it work, to make the workplace more comfortable and more enjoyable. We have paid attention to everyday cleanliness. And in general, giving straightforward feedback, and all kind of collaboration, this is what we have really tried to achieve.

*Mikko/Aa:* The next question deals with the same issue: Do you work alone or together with others, and are you satisfied with the situation?

*Liisa/B:* Most of the time I work alone, but then we have such work on the production lines that two or three of us work together, or a few of us are in the assembly line. But we do work quite intensively, I mean, as we have the teams, we are five on the night shift, we do talk about problems, even though work itself is being done by everybody alone. And I am satisfied with the situa-

tion, if that was the question.

*Mikko/Aa:* Do you get support or do you expect support from anybody?

*Liisa/B:* Well, the most important support comes from workmates.

*Mikko/Aa:* Not so much from supervisors?

*Liisa/B:* Not so much. Yes, they talk a lot and try to motivate us to develop etc. But once you invent some improvement, they say they have no time, it's not possible. It's ignored. One improvement is that we now have monthly meetings team by team, in which we check what has been done during the month. And we check reclamations, to know what has brought us positive or negative feedback. But direct feedback from foremen at work itself, we hardly get any of it. (*DD-session 01/98*)

Liisa did not present teams and teamwork in an idealized manner. Nevertheless, teamwork had solved some of the problems of collaboration Mikko was struggling with. "Teamwork" as the topic of dialogue built linkages between Mikko's and Liisa's perspectives. In addition to this, Liisa could expand the issue of teamwork beyond the problems articulated by Mikko. She described how teams worked in Firm B.

*Excerpt 8.4*

*Liisa/B:* Well, we have this allocation of tasks, it used to be done by the foreman, but now that we have teams there is a guy who oversees the production control. We have a kind of white-board system in the office. And there, a traditional clothespin with a label "Liisa" will tell at which machine Liisa is going to work next.

*Mikko/Aa:* Has that system worked?

*Liisa/B:* Yes, it is a good system.

*Mikko/Aa:* Who decides what will be done and how the resources are allocated?

*Liisa/B:* To a large extent, it is the guy who controls the production in our team. Plus, beyond that, it is done by Pekka, what-sha-ma-call-it, a production manager, and then our quality manager, who kind of looks after, kind of makes the labels. But mainly, it's Risto, our production controller, who allocates tasks and checks which machines have urgent jobs<sup>48</sup> and which should be cleared. (*DD-session 01/98*)

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<sup>48</sup> In this chapter, "job" ("työ" in Finnish) refers either to a set of work tasks or, more specifically, to a customer's order to be accomplished by workers and machines. "Job" does not refer to employment ("työpaikka," "ansiotyö").

## PHASE 2: THE INVENTION OF TEAMWORK

After the first DD session, Mikko talked about the team idea with his foreman Juha, who also participated in the DD intervention. The foreman supported his idea. Also, some of their work peers got interested in teamwork. It was seen as a solution to the monotonous work and to chronic hurry and delays in production.

A group of workers and the foreman planned work groups of three or four people. A team would decide autonomously the order of work on the basis of delivery times, without consulting the foreman in every phase.

In the second DD session, two weeks after the first one, Mikko took up two issues, first, the manufacturing and maintenance of tools and maintenance of machines, and, second, teamwork. As was shown in Phase 1, Mikko had introduced the maintenance issue as a potential area for the development of his work. Teamwork had been introduced by Liisa.

Tools maintenance evoked a lively discussion in the same manner as in the first DD session. Kari had noticed the tools that had been sent for repair to his firm from Mikko's firm.

*Excerpt 8.5*

*Mikko/Aa:* It's not easy in our firm, if a tool gets totally broken it will be sent to Firm A [mother company], and then it really takes a long time.

*Liisa/B:* Yes, it's a problem...

*Mikko/Aa:* Then it takes time. (-) It is mailed there, and they start checking it, it takes, easily, a month before it comes back to us.

*Kari/A:* Now I think I know what some of the tools lying around are. [Laugh.] They have been, by the way, really busted, those that come there. (*DD-session 02/98*)

After the discussion on the maintenance issues, Mikko took up teamwork. With a comment, "Go ahead," Kari gave up the consultant's role to Liisa who represented the "expertise" of teamwork in the group. Mikko spoke, while at the same time filling in the form on the "personal developmental project."

*Excerpt 8.6*

*Mikko/Aa:* We can, of course, write down things like the improvement of tools... That teamwork in our place, I have suggested it, but it is really miserly. (-) What's most irritating is that when somebody is in a great hurry to accomplish something (-), others make goods for stock at the same time, and still others are just

loitering around doing nothing. It bugs me most.

*Liisa/B*: # How about...

*Mikko/Aa*: Why can't someone go and help?

*Liisa/B*: Well, yes...

*Kari/A* [to *Liisa*]: Go ahead.

*Liisa/B*: How have you organized the allocation of work, who puts the work cards on the loading board?

*Mikko/Aa*: It's Juha, the guy who is also here [in another DD group].

*Liisa/B*: What kind of system have you got for deciding who's going to work at which machine, or do you have personal machines?  
(*DD-session 02/98*)

Excerpt 8.6 shows a *turning point* in Mikko's Developmental Dialogue. *Mikko made a sudden shift from the maintenance issues to teamwork, after which teamwork became the main object of Mikko's developmental project, and expanded actually into a project for the whole firm.* Why did this shift from tools maintenance to teamwork take place? From a researcher's point of view, the maintenance of tools and machines would have been interesting enough as a topic, nicely connecting a worker's personal project with production work carried out in an interfirm network (relationship between Firm Aa and Firm A). For Mikko, teamwork obviously represented one of the preconditions for expanding work tasks and skills, bringing necessary autonomy and responsibility to work.

Work in Firm Aa, at that time, was organized so that principally one worker accomplished a production process of a certain item, from the beginning to the end. The aim was to avoid repetitive assembly-line work. However, now each worker had to manufacture large series of items, which also made work monotonous and isolated from peers. Mikko argued that the foreman alone could not manage the planning of production, and that the prevailing system did not support workers' collaboration, responsibility-taking and autonomy.

*Excerpt 8.7*

*Mikko/Aa*: We have the whole system really in its infancy. The most urgent thing is always being done next. That's how it goes. If we had a kind of teamwork, we could rotate a bit, and another guy could give a hand, when working on something that has many production stages at different machines. One could be... one could make...

*Liisa/B*: So that there would be a kind of line-up, the next guy already there... starting the next phase...

*Mikko/Aa*: ## Yeah, in line. It's funny, you see, women perform by manual machines spring-by-spring, just crazy amounts – it re-

quires skillful fingers – to do that. Another guy, sitting next to you makes something for the stock. Can't possibly help the other one.

*Liisa/B:* Wouldn't that be the place for some development?

*Mikko/Aa:* That would really be! [Laughing] The whole thing could be split into teams and within the teams, let them accomplish the work properly. (*DD-session 02/98*)

The discussion about the problems and challenges of Mikko's work continued, focused on and related to the need for teamwork. Liisa's and Kari's questions reflected their experiences from the practices in their own firms. The need for developing teamwork in Mikko's firm was further articulated and confirmed in the dialogue.

*Excerpt 8.8*

*Mikko/Aa:* Yeah, you see, it would make Juha's [foreman] work easier, he would only need to distribute the work cards among the teams, and we could organize the work by ourselves. Now he is trying to organize it by himself; it is a total muddle. And damn it, when we are lagging behind as much as five weeks, five cards over there, and you know that it will take months to clear it all, that time keeps doubling over and over again.

*Liisa/B:* We are lucky to have the assemblers in each team who organize the production and allocate resources, as they know it much better. It used to be done by Pekka and this present quality manager, but they do not have all the time to spend in the production hall. The assemblers who set the machines know which job is going on where, and which machine will be available for which work. It's much simpler.

*Mikko/Aa:* In our workplace, somebody who is lagging behind, well, goes and gets a new card and starts to do a new job. Regardless of the old ones, you must make the new one, even though you had 50 000 boxes and springs and four phases waiting to be completed in a week. [Liisa laughs.] And they think that a man is a machine. Whereas, in the beginning, it takes some time, when getting a new task, to learn it. They think that the work efficiency increases steadily all the time. Well, it doesn't, there are hitches every now and then. (*DD-session 02/98*)

Liisa urged Mikko to talk about the problems with the quality control consultant who used to visit both Alliance firms at that time.

*Excerpt 8.9*

*Liisa/B:* But doesn't Mr. Koskinen often visit your firm as well?

*Mikko/Aa:* Yes, he does.

*Liisa/B:* Why don't you talk with him about the team issue, he helped us to get started with team training. (*DD-session 02/98*)

The last DD session was devoted to work on the personal developmental projects of the participants. At the end, each of them presented his or her project to the rest of the group by answering certain questions concerning the learning challenges, potential problems, need for resources, and support at work in carrying out the planned project. The questions are marked with italics in Excerpt 8.10, in which Mikko told about the outcome of his DD process.

*Excerpt 8.10*

*Mikko/Aa:* Does this show it clearly? I have here tools maintenance and checking, teamwork as a kind of a *developmental project*, primarily teamwork and then tools. The *changes on professional skills*, well, what these issues will bring with them. Obviously one must learn what comes along... About *personal attitudes*, one should be more open and ready to tackle difficult issues and other problem situations, not brushing them off at once. And to accept new arrangements. And, then, *with others*, of course one should improve cooperation with the management and other workers as well, collaborate more readily, and do joint jobs in small groups, and whatever teamwork brings along with it. The *need for more knowledge*, about how we could start with the teamwork. And now we should go and visit Firm B or some other similar thing, in order to learn how to start. Will it take special courses or can we try and start on our own? And first we should agree on those issues with the management... To find out whether these issues are possible in general. About the *next phases*, if it is possible to start then we have to think how the groups are formed and so on. And about the *time schedule*, if we had some kind of teams - or by whatever name that work community will be called - in action before the summer holidays. That would be enough for a goal. About *obstacles*. To be sure, all the workers won't accept this kind of new arrangement, in the beginning. We could first try to agree, as we have agreed some time before, that one simply stays away if not interested, or something like that, if it goes that far. About the *need for support*, of course, you need time and support from supervisors

and workers. That's all, I guess.

*DD leader:* Did you mean by tools maintenance and checking that you would expand...?

*Mikko/Aa:* It's kind of your own... own...

*DD leader:* Your own know-how?

*Mikko/Aa:* Yeah, or then somebody else's, but it should be developed anyway. (*DD-session 03/98*)

To summarize, teamwork as topic of a developmental project exceeded the limits of a personal task to concern the activity of the whole firm. This outcome was clearly influenced by the dialogue carried out in an interfirm setting. Teamwork appeared as a boundary object available for the participants. For Liisa from Firm B, teamwork was a more familiar and timely topic than, for instance, network relationships between Firms Aa and A, which might partly explain the somewhat surprising shift from the maintenance of tools and machines to teamwork in Mikko's developmental project. All in all, teamwork as a topic seemed to include elements highly relevant to the work situation in Firm Aa. Mikko and Juha, the foreman of Firm Aa, realized that by uniting in the teamwork issue they would have better chances to promote change at work.

### PHASE 3: DEFENDING THE TEAMWORK INNOVATION

The start of teamwork in Firm Aa was not self-evident. Manager Aa was suspicious for two reasons. First, there were already projects going on in the firm and, second, a small firm of less than fifteen workers did not seem very suitable for teamwork. Also, the management group of the *Together*-project of the Alliance was to some extent reserved towards Mikko's project, as came out in a feedback meeting a week after the end of the DD process. It gathered together representatives of DD participants, one from each firm, the DD leader and researcher, managers of the firms, and the management group of *Together*-project. Mikko represented Firm Aa. This phase meant a certain culmination of the trajectory of bringing the worker perspective into interfirm collaboration.

The aim of the meeting was to present the outcomes of DD intervention, and to discuss the possibilities of continuing the DD processes in the frame of the *Together*-program. The DD leader presented the results, that is, what kinds of personal development projects had emerged. As an example, she showed the outcomes of Juha's DD process (anonymously and with Juha's permission). Juha was the foreman of Firm Aa who had also taken teamwork as his developmental task, influenced by Mikko's initiative.



*Excerpt 8.11*

*DD leader:* When starting to do teamwork it involves, of course, the question of tools by which the work is allocated. So a notion arose that a work-allocation board should not serve the foreman alone but would be a shared tool for joint evaluation, for everybody to write down things on it and use it. (-) From these goals, then, this person selected teamwork as his most important developmental project, which involves the flexible use of the machine groups. In other words, the developmental project included not only the extension of personal knowledge and skills but also - for a foreman, of course, teamwork means a considerable challenge and rethinking of his work - but also developing the knowledge and skills of the whole company. (*Feedback meeting 03/98*)

In the discussion, it was pointed out that projects like teamwork are quite large and tend to spread to across the Alliance as a whole. The manager of Firm Aa was very doubtful and tended to reject the idea.

*Excerpt 8.12*

*Manager Aa:* Within the frame of the Alliance, we really get plenty of projects, and if the developmental dialogues bring along such large projects, like starting with teamwork, and other projects of that level of effort, we will certainly drown with them! Of course each workplace has the freedom to consider what it will carry out (and through which resources), but, somehow, I understand that these would be on the personal level of the development of professional skills and the like. (*Feedback meeting 03/98*)

After this, managers A and B talked long about the projects of the Alliance, which were at that time being planned in the management group of the *Together* project. They emphasized the prioritization of the projects and resources in the scale of the whole Alliance. Manager A tried to show that, in fact, the developmental needs, articulated by the participants of the DD process, were already included in the planned projects of the Alliance. He pointed out that these projects would soon be entering the firms as the management group had finished the plan.

*Excerpt 8.13*

*Manager A:* All in all, what has been listed there [the developmental dialogue themes] and what has come out in the open, is already

taking place, or they are included in our plans. We are dealing with them next Monday in our management group, all in all. Maybe the grouping is not final yet, but okay, the titles will be formulated, and after that I think they will be transferred to the firms. And then it is, of course, the staff that is going to put them into effect. But there are certain frames figured out, in which we act.

(//)

To me, the power of the Alliance in the future is in that one firm becomes a builder and a subject of an experiment, and others scrutinize and test it. And when we then realize “hey this works,” it will be spread to other firms. But this is not meant to prohibit interfirm cooperation in the frame of the Alliance within these projects. But, as the warnings have been sounded about having too many projects going on, I admit that the risk is real. But there must be prioritization and goals related to the resources. (*Feedback meeting 03/98*)

The planned model for the project activity was such that one firm was to act as a pilot firm, and the results would then be spread to other companies. Right after this Mikko took the floor and commented on the prioritizing issue. A short debate took place.

*Excerpt 8.14*

*Mikko/Aa:* In our firm, we have actually decided with Juha that teamwork is going to be the most important thing for us, the big thing. The other tasks are smaller, they are carried out as they occur. We just kind of talked about that Firm B already has teamwork in motion. We should visit them first.

*Manager B:* Or it has been tried, it is in no way in full motion yet!

[Encouraging noises:] ## But it is a real good example. ## It is one possibility.

*Mikko/Aa:* In any case, it has progressed further, it would be nice to know in what direction...

*Manager A:* ##You can always exchange ideas.

*Manager B:* ##You can exchange ideas; it's true, and they have already gained some kind of experience, too. (*Feedback meeting 03/98*)

If the first *turning point* of the trajectory was the shift from maintenance issues to teamwork (Phase 2), *this piece of discourse was another one. Here Mikko was actively taking the initiative concerning the development of work in his firm. He was*

*speaking out in a situation where such an initiative was not necessarily expected from him, considering the nature of the meeting.*

The meeting as a whole pushed forward discussion at the network-ideological level, displaying tension-laden perspectives emerging in the network. The DD leader wanted to emphasize linkages between personal developmental tasks and the development of the entire firm. Manager Aa expressed an opposite opinion, that the developmental projects should be confined to a personal level. He was doubtful of large projects resulting from the DD processes. Manager A, representing the management group of *Together*, supported workers' projects, but wanted to organize them under the *Together* sub-projects. Mikko, however, was very determined, referring to the support from his own firm as well as Firm B. The introduction of the workers' teamwork project was a strong intervention in the activity systems of Firm Aa, as well as in the entire Alliance and its *Together* project. The resulting confusion in the situation contributed to the fact that "teamwork" as a boundary object remained split and contradictory.

#### PHASE 4: STARTING THE TEAMWORK PROJECT IN FIRM Aa

Despite the debate and doubts, the teamwork project was launched in Mikko's firm soon after the feedback meeting. To start with, all the employees of Aa visited Firm B to hear about their experiences of teamwork. Manager Aa had given his consent to the project, but wanted to carry it out "among themselves." His wife (later referred to as "Trainer Aa") who worked for the firm to develop a quality control system, gave lectures on the basic principles of teamworking, such as communication in small groups. The first big issue was the formation of teams by means of allocating people in small groups, which evoked a heated debate among the employees.

Two months after the feedback meeting, Mikko and the foreman Juha came to the first follow-up meeting of the Developmental Dialogue procedure. They explained to their colleagues from other Alliance companies how the development work had proceeded thus far. I was chairing the meeting, together with the personnel manager of the Alliance who asked Juha, the foreman of Firm Aa, to tell about the start of the teamwork project in Firm Aa.

##### *Excerpt 8.15*

*Juha/Aa:* The start was encouraged by the Developmental Dialogue and Firm B's people. So we started to carry it further with Mikko. We thought we were on the right track, but the first comment there [by the manager] was that it won't work here. [Laugh.]

*Mikko/Aa:* That was a “Nope!”

*Juha/Aa:* [Manager argued] that “We are a such a [small company] that it will not work...” But somehow a little inspiration... came in fact more from below, I mean from the workers. And then they are forced to join in, from the top. The start was rather action-packed, and now we are in a phase where we have even organized people into teams. Next we are going to organize the work as well, to plan, to allocate, also as regards the production planning. We have not decided yet when to take the next leap, to test it in practice. Next week, we are still going to have a two-hour training session for each team. (*DD-follow-up 05/98*)

We learn that the development of teamwork in Firm Aa had got its first impulse from the Developmental Dialogue pilot, particularly from the workers in Firm B. Thus, an extensive project in Juha’s and Mikko’s firm had actually grown out of interorganizational discussions between the workers. The training and organizing phase was proceeding, and they were planning the next step, which was to implement teams in the production work. The personnel manager of the Alliance asked what Juha saw as most difficult in introducing teamwork.

*Excerpt 8.16*

*Juha/Aa:* First of all, the heterogeneity of the personnel, how to fit them into that. And then we feared how to keep a certain job within a team. I personally had the responsibility for the allocation of jobs, so I worried about whether it is really teamwork if one and the same job is being done by two teams. We haven’t obtained any knowledge yet about how work is allowed to behave in a teamwork environment. Should teams keep strict boundaries, so that one group will do a specific job or what is the division of labor?

*Mikko/Aa:* Now we have kind of tried to do it so that one and the same team could accomplish the work from the beginning to the end. Without tossing it between the teams. (*DD-follow-up 05/98*)

Juha mentioned two kinds of problems: First, how to make different people work together in teams, secondly, how to divide the work between the teams. For example, he wondered whether it would matter if one and the same job had to pass through two teams. This was what he expected would happen, based on his experience.

Being a foreman, Juha was naturally concerned with how to master the production in the transition from the individual to the group-based organization of work. He worried about how to manage the allocation of jobs across the boundaries of the teams, not considering that his responsibility for the allocation might be changed and shared with the teams in the new system. Mikko wanted to push this issue a little by emphasizing the need for keeping jobs within the teams.

Juha concluded by stating: “We haven’t obtained any knowledge yet about how work is allowed to behave in a teamwork environment.” This comment reflects the fact that teamwork, to some degree, was imposed upon the work process as a new organizational solution without first analyzing the requirements of the work itself. In that sense, the worries of the manager were justified. However, the most striking feature in this phase was the absence of interfirm cooperation or contribution of any kind except the visit to Firm B. I have suggested that the network was present indirectly, as it generated pressure on the development of Firm Aa (Toiviainen, 2002). Participation in the Alliance and the *Together* project made the activity of Firm Aa more transparent to its partners.

#### PHASE 5: JOINING THE TEAMWORK PROJECT OF FIRM B

Even though Firm Aa started the teamwork project on its own, the management group of the *Together* project had agreed on its integration with the team project of Firm B, which was the official team project of the Alliance. Firm Aa was invited to join the project meetings of Firm B. I attended the second joint meeting in October 1998. The team project of Firm B was the topic of discussion most of the time. Towards the end of the meeting, issues of Firm Aa were also taken up. Typically, the participants from Firm Aa debated with each other, the representatives of Firm B posed some questions, and then went on to reflect on how they had solved a similar problem or how they had experienced the issue in question.

It turned out that Firm Aa had not yet implemented teamwork in production. Mikko commented critically on the way the team project had been started. The opinions of the workers had not been heard, he claimed, in spite of a long joint planning process. Manager Aa kept on questioning the teamwork concept and its applicability to firms like B and Aa.

##### *Excerpt 8.17*

*Manager Aa:* I would like to repeat what I already said in Hotel Elk [place of the previous meeting in September], even at the expense of my good reputation: You can advance quality, cleanliness and

order outside the teams, as well. Now we sacrifice a lot of brain capacity to thinking about how we could get teams to work; it's kind of a compulsive search for teams. But could we find another name for a "team" to make it sound more natural? Because to me, at least, it has become crystal clear that we will never reach pure teamwork in such jobs as are done in Firm B [and] Firm Aa. (*Project meeting 10/98*)

Mikko suggested that if they could not apply teamwork in production, they should exercise teamwork and collaboration with maintenance cards. This meant that teams would take care of the maintenance of certain machine groups: First, establish the maintenance documents (maintenance cards) and then keep them updated and take responsibility for the condition of the machines. *The idea of the maintenance cards associated teamwork with Mikko's initially-articulated object of development, the maintenance of tools and machines.* This initiative (Excerpt 8.18) may be called the *third turning point, even though it remained a potentiality, neither elaborated in the meeting nor implemented at once in the production work.*

*Excerpt 8.18*

*Mikko/Aa:* But we haven't had a chance at all to try out this teamwork in practice in our firm.

*Trainer Aa:* Why haven't you? [Irritation.]

*Mikko/Aa:* Because there have been quite a few sick leaves and a terrible rush. It has totally failed to take place. In my view, we should finally get those maintenance cards for the machines and, in that way, practice teamwork with the machines (-) so that a certain pers-, a certain team shares the same [machine].

*Trainer Aa:* Put pressure on Juha, I can't do it.

*Mikko/Aa:* We could, kind of, practice teamwork by taking care of the maintenance of machines. Because we can't practice it in actual work tasks, we simply have to [exceed the boundaries of teams in production].

*Manager Aa:* Well the fact is that the main task is to get the work done (-).

*Mikko/Aa:* Right, it is the main task, it all got so mixed up, that we can't kind of..

*Manager B:* So it is the work that actually disturbs teamwork. [Laughter.]

*Mikko/Aa:* So we could practice cooperation by way of the machines, kind of.

(//)

*Researcher:* Mikko made a nice suggestion to start somewhere, not staring at who belongs to which team, but with the spirit of fixing this collaboratively and considering how to proceed... And, of course, it will not be perfect all at once, and it will also fail, but to start somewhere.

*Mikko/Aa:* Because we must do the work in any case. (*Project meeting 10/98*)

The main problem of implementing teamwork was that the production of a certain product did not follow the boundaries of teams. The foreman had taken this up in the previous phase (Excerpt 8.16). Manager B joked that, "We must stop working and do teamwork instead."

*Excerpt 8.19*

*Worker B1/B:* # (-) You said that teams have fallen flat. What do you mean by that?

*Mikko/Aa:* They are, in principle, in action, but as we've got many jobs going on simultaneously, we can't do them in teams, but it varies a lot.

*Liisa/B:* So you mean you have appointed to teams work areas; what belongs to...

*Mikko/Aa:* In principle, I mean, as based on the machines, but now (-)...

*Trainer Aa:* ## Basically based on the machines.

*Liisa/B:* ## I see, you can't [work in teams], because you have got other jobs to do.

*Mikko/Aa:* Yeah. We could...

*Manager B:* Go ahead! Call [the sales manager of A] and ask him to stop sending orders, because we are now concentrating on teamwork here! [Jokes, laughter.]

*Trainer Aa:* Yeah, or we only take on such orders that will suit our team. (*Project meeting 10/98*)

The last Excerpt 8.20 of this phase includes a short exchange between Trainer Aa and Manager Aa about the change teamwork is expected to bring. Trainer Aa summarized the advantages of teamwork in a manner that probably reflected the generally-shared views of the workers, whereas the immediate reaction of the manager, flavored with dilemmatic talk, referred directly to one of the most intricate problems of implementing teamwork in Firm Aa.

*Excerpt 8.20*

*Trainer Aa:* What I imagine to be the advances of teamwork is, above all, that we take responsibility for our own tasks, we think over how to make it flexible, how to shorten the process time. Not expecting that somebody tells you to do this and that, if you can decide it more efficiently within a team or, in general, within a work unit. To decide the order of jobs, who is doing what, who is the best for a given work phase. Above all, to shift the responsibility from these gentlemen [manager and foreman] to the hall.

*Manager Aa:* Us old-timers, really put a drag on change? Sure I will go and tell them what to do - even though a team is not asking for my advice - tell them what I think is the easiest way [to do it], but I must get out of that habit... (*Project meeting 10/98*)

Compared with the preceding phase, the teamwork project was now drawing on network resources through cooperation with the teamwork project of Firm B. In general, nevertheless, teamwork tended to focus strongly on the interaction within Firm Aa rather than networking within the entire Alliance. Two intrinsic problems were becoming increasingly explicit: First, that teamwork was, to some extent, imposed on the work and, second, that teams were not given the necessary autonomy over traditional top-down management. The final phase of the trajectory will show how these problems were connected to the conditions of interfirm collaboration.

#### PHASE 6: IMPLEMENTING TEAMWORK IN THE PRODUCTION OF FIRM Aa

During the winter of 1998–1999, the Alliance organized team leader training for people from Firm Aa and Firm B. It also organized weekends for the project groups (teamwork among other development projects of the Alliance), in order to intensify development work. Representatives of teamwork pilot firms B and Aa participated in these seminars. One of the seminars was held in April 1999.

Debates on teamwork were going on in both firms. In Firm B, the main issues were the reward system of teams and the power and responsibilities of teams. In Firm Aa, the implementation of teamwork was just starting, and profound discussions had been carried on among the personnel. People felt that it was not at all easy to change the deep-rooted habits and roles in the company. The seminar participants referred to the different stages and needs of the firms. In the joint discussions, they still found shared team-related topics which interested both parties.

During the seminar, the project group divided into small groups to discuss various aspects of teamwork in both firms. Because Mikko could not participate



in the seminar, the task had been delegated to another worker, Aa1. I participated in a small group with Worker Aa1 and workers B1 and B2, who discussed the theme “the power and responsibilities of teams.” Worker Aa1 referred to one of the initial difficulties in Firm Aa.

*Excerpt 8.21*

*Worker Aa1/Aa:* We are in the beginning phase, really. Right in the beginning. [In a certain situation] we were discussing that Juha [the foreman] should start giving up those tasks that actually belong to us. He has done them automatically. And [Manager Aa], then, has Juha’s work to do. That’s how it goes... Juha steps into the hall and does the work that might not be his to do.

*Worker B1/B:* You mean he comes to the hall to do those jobs?

*Worker Aa1/Aa:* Yeah, Juha, yeah.

*Worker B1/B: ##* Simply cannot stay away... (*Project meeting 04/99*)

Worker Aa1 also mentioned some changes teamwork had brought about in the firm.

*Excerpt 8.22*

*Worker Aa1/Aa: ##* As we formulated these rules, so they are still in the making (-). Gradually we are trying to establish a system in which [Worker Aa2] really knows in which order the jobs should be done and which ones are rush jobs. In case nothing else has been said in a phone call, or whatever. And [Worker Aa2] would give us word of an urgent delivery to have somebody take it up. So we wouldn’t need Juha that much anymore, one phase would drop out. We check the work cards on our own, and we have decided to meet every Monday to check our jobs, which ones are rushed.

*Worker B1/B: ##* Yeah. Kind of a production meeting.

*Worker Aa1/Aa: ##* Yeah.

*Researcher:* Is it [the production meeting] already in action?

*Worker Aa1/Aa:* Yeah, it has started quite nicely.

*Researcher:* That’s great.

*Worker Aa1/Aa:* Mm. But it was really thorny in the beginning.  
[Laugh.] (*Project meeting 04/99*)

A new phase of teamwork was just about to emerge. About four months later, in August 1999, the Developmental Dialogue group had the second follow-up meeting, chaired by the DD leader and the researcher. Mikko described the state of teamwork in Firm Aa.

*Excerpt 8.23*

*Mikko/Aa:* We are in team training together with Firm B. We have been hanging on for a year now [laugh], sometimes higher up, sometimes really down.

*DD leader:* What do you mean by really down?

*Mikko/Aa:* Sometimes it feels like a full stop, that there is no sense going on, but then there's a turn for the better. There are so many and so different kinds of people that some feel it simply (won't work). But now we are going up again and looking forward to the team leaders' training that starts next month.

*DD leader:* Yeah. How do you feel about it [teamwork] yourself?

*Mikko/Aa:* Well, for me it is ok, I don't know whether it makes work any easier but it makes it different from what it used to be. One can take a little more decision-making power for oneself. This has really been our worst problem: we get responsibility, but no real power to go with it. (//)

*DD leader:* What would be a recent example of having responsibility without power?

*Mikko/Aa:* It is linked to the production control in principle, to the work cards, to these systems. We can fix the systems on our own, what we are going to do and how. The worst thing is that they will interfere, no matter what you have planned [in the team]. (*DD-follow-up 08/99*)

Mikko took up the problem of the autonomy of teams. Parallel to the new team-based system, the old practice of the firm seemed to continue to exist. No matter how teams negotiated and planned their work, the manager or foreman could intervene and bring an urgent task "in between." A short but revealing discussion took place between Mikko and the foreman of the mother company, Firm A.

*Excerpt 8.24*

*Foreman A:* I see. When I call [Manager Aa] he goes immediately and interferes with your work! [Laugh.]

*Mikko/Aa:* Right.

*Foreman A:* Yeah.

*Mikko/Aa:* Well, sometimes he must...

*Foreman A:* [I must call your firm] because the customer has called me.

*Mikko/Aa:* ...must do that sometimes, but not all the time! (*DD-follow-up 08/99*)

Foreman A referred to a typical situation, in which a customer contacts Firm A that receives all the orders and hands certain orders over to Firm Aa. Firm A then contacts Firm Aa to get the information the customer has requested. This discussion episode was the *fourth turning point* I observed in the collaborative discourse. *Thus far, teams had been conceived as intrafirm modes of organizing work, and even there issues other than the conditions of production had been in focus (e.g. motivation, and group dynamics). Now the problems of teamwork were put in a context practically ignored in the teamwork project of the Alliance. In other words, the problems were addressed at the level of production in a partnership of multiple firms.* Teamwork inside the firm took place in a sub-network of firms exceeding even the boundaries of the Alliance.

## 8.5 Conclusion

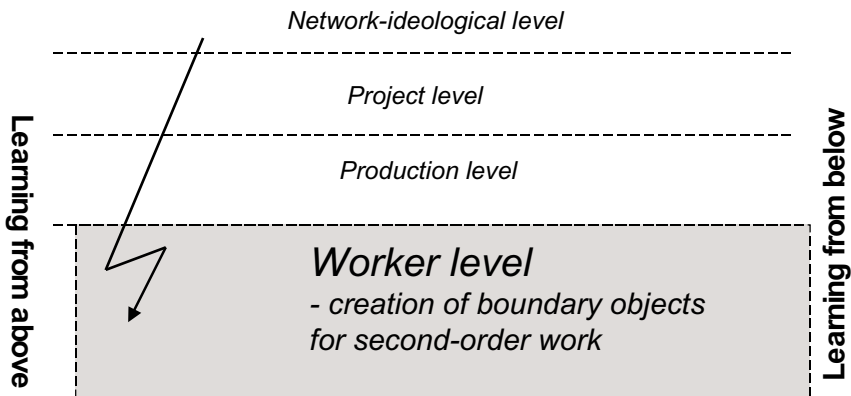
This chapter started from the intervention we carried out in order to encourage and articulate the worker perspective in networks. The research question was: *How can interorganizational collaboration enhance the workers' needs for development and learning at work?* The outcomes of the process were manifold. For one thing, the Developmental Dialogue and the process that followed proved successful in promoting workers' collaborative discourse and learning across organizational boundaries. Connected to this, teamwork as a boundary object worked nicely in bringing together a wide array of perspectives on collaboration within the Alliance. However, it was apparently problematic to get teamwork stabilized as an organizational practice in the production activity or reach stabilized interfirm practices through teamwork.

The creation of boundary objects seemed essential in bringing a worker perspective into interorganizational collaboration and in enhancing interaction across the levels. The analysis suggests that boundary objects are transitional and fluid, constantly changing: from object to tool and back, from a personal project to a project of a firm and multi-firm partnership, and so on.

However, teamwork also turned out to be fragile and disputable as an object of collaboration, and its stabilization in the production organization was questionable throughout the process. In effect, the worker perspective was at risk to be fading away in the multi-firm collaboration. The problems observed in this case are inherent to the concept of teamwork as it is implemented within hierarchical organizations. The need for reinterpretation and reconceptualization of teams, in the context of partnerships and networks, has been shown in numerous studies (Ancona & Caldwell, 1992; Pelled & Adler, 1994; Schrage, 1995; Zetka, 1998; Y. Engeström, 1999).

As the case of Mikko and his developmental project showed, teamwork directed attention to the development of the intrafirm organization. This might have been necessary for the “modernization” of the production in the Alliance firms, but obviously it became an obstacle for expanding the worker perspective across the firm’s boundaries to the larger partnership.

A critical view on teamwork may help to understand the persistent problems of the workers’ teamwork project in Firm Aa, as reported throughout the trajectory. Teamwork was imposed on a hierarchical intrafirm work organization without considering the requirements of the production in an interfirm partnership. Thus, it was difficult, indeed, to get work “to behave” properly within teams. Consequently, the manager and the foreman kept on problematizing the interfaces that mediated interaction between the partner firms. The workers experienced this as an annoying and irritating intervention in the teams’ autonomy<sup>49</sup>.



**Figure 8.3** Learning at the worker level of collaboration

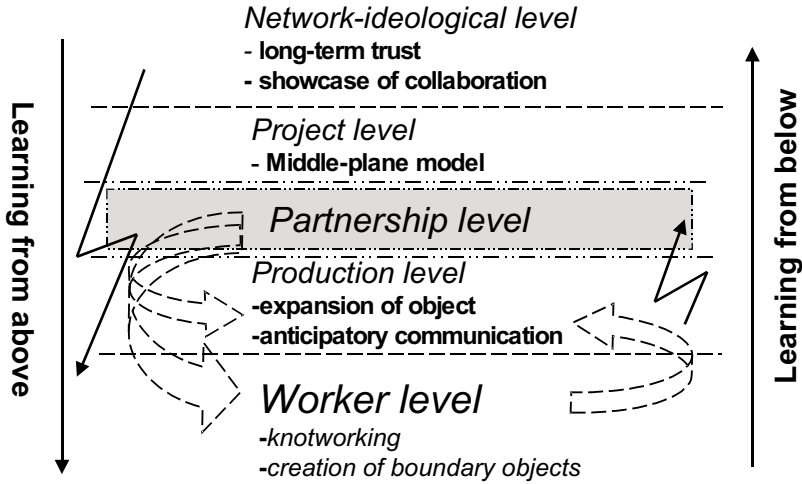
The worker perspective was *introduced* into interfirm collaboration through developmental projects (second-order work) by creating powerful boundary objects (Figure 8.3). The *stabilization* of the worker perspective seemed possible only through an integration of teamwork with genuine production activity, which means that the focus must shift back to first-order work, and to the object of collaborative production. A proper teamwork partner for Firm Aa in the next phase

<sup>49</sup> These are typical problems of teams and teamwork reported in organizational studies, but rarely analyzed in the network context. Solutions of the type “Change the Role of Functional Managers” (Donnellon, 1996) direct attention primarily to intra-organizational relationships.

would have been the mother company Firm A, and even the customers “behind” Firm A. As far as I could observe, the management of the Alliance did not lead the project in this direction and, consequently, the workers’ learning remained only partially expansive. Expansion was limited to the learning outcomes gained in the second-order development partnership between Firm Aa, Firm B, and Firm A, not widening to the first-order production partnership between Firm Aa, Firm A and their customers. It might have taken another intervention to explore this line of development.

The third hypothesis on learning across the levels may now be elaborated (Figure 8.4). *The most important feature of it is the emergence of a new level of collaboration, namely the partnership level.* Clearly, the emergence of the worker level in the zone of proximal development of collaboration was not possible without being supported and enhanced by the partnership within the Alliance. The appearance of an intermediate level was already anticipated in the preceding analysis (Chapter 7) where I discussed the “gap” in learning from the project level to the production level. Now it seems obvious that also production could be determinedly developed only through partnerships (from-above arrows). *Neither the network-ideological level nor even the project level could contribute to learning in production and among workers in a sub-network powerfully enough* (from-above lightning-shaped arrow).

The worker level intervention showed that second-order developmental projects, carried out at the worker level, were not in themselves sufficient for stabilizing new networking practices in partner companies. Despite the fact that learning at the worker level was limited, the analysis showed the necessity of linking it to the production collaboration taking place in the context of a multi-firm partnership (arrow from the worker level up to the production level in Figure 8.4). The hypothesis of the zone of proximal development, assuming the importance of worker level learning, was thus confirmed, but also specified in terms of the partnership level needed for supporting learning. Whether the partnership level could reciprocally learn from below remained an open question (from-below lightning-shaped arrow). Had the Alliance encouraged workers to cross the boundaries in the production activity as well, it would have been forced to change its practices of collaboration, in other words, as a sub-network to learn from below.



**Figure 8.4** Hypothesis 3 on learning across the levels of collaboration

Workers' learning in partnerships and networks can be enhanced by interventions if integrated with real change processes going on at work. Workers' knowledge, skills and perspectives should be included in the development of collaborative strategies. As Barley (1996, p. 436) puts it, "... advocates of teams most often speak of enhancing commitment and involvement, rather than of linking specialists with complementary knowledge." Interventions should not be used merely to generate commitment towards strategies at the level of network ideology. In this respect, managers and researchers of networks need to consider carefully the preconditions of and the motives for worker-level projects and interventions.



## 9 Conclusion

This research started from the observation of the managers of small subcontracting companies having gathered to discuss the potential of a new type of collaboration and networking. The cycle of development during the 1990s, explored in Chapter 5, charted a path from negotiations on the network ideology up to the emergence of production-based partnerships situated at the threshold of a new developmental cycle (Figure 5.2). From an activity-theoretical point of view, this trajectory was analyzed as a process of object construction, which proved to be heterogeneous and multi-level in nature. Learning in networks was interpreted in this context. *Learning in networks as dynamic interplay between multiple levels* is the main insight of my study. In this chapter, I will discuss how this notion emerged from the empirical chapters with corresponding research questions (Section 9.1) and what kinds of theoretical implications it engendered (Section 9.2).

### 9.1 Key findings

The problem setting proceeded in two steps. The analysis of the network evolution in Chapter 5 revealed, first, the multilevel nature of collaboration, emerging gradually from the network ideological premises of the Club. The levels could be differentiated in terms of the major learning challenges they put forth for the participants and the entire network. Having addressed the *network-ideological level* in the historical analysis (Chapter 5), the other research questions were formulated to explore the remaining levels, which were the *project level* (Chapter 6), the *production level* (Chapter 7), and the *worker level* (Chapter 8). Thus, the emerging notion of levels guided my empirical study and data gathering to deal with learning at each level. To start with, I will summarize the findings of Chapters 5 to 8.

*Research question 1: What do network typologies and network evolution tell about learning when interpreted through developmental contradictions and expansive learning? (Chapter 5)*



The analysis was aimed at examining the Club as a network of subcontracting companies. I studied the nature of the network in question, its history, and the learning challenges it encountered when creating objects of collaboration. It was found that the Club, having started from rather abstract network-ideological premises, had produced a heterogeneous set of collaborative activities. Some of these, such as the projects of the Club, were explicitly planned and carried out by the Club organization, whereas the remaining ones, including collaborative production, were more or less invisibly developing among sub-networks of various kinds. This meant that learning in the multi-layered setting was heterogeneous in nature. It proceeded in the bi-directional movement of *learning from above* and *learning from below*.

As the Club did not seem to fit any of the pure network types offered by the literature, I used typologies heuristically to form the “typology of the Club,” implying that the Club had features from several network forms (Table 5.3). This directed my attention to the heterogeneity of the network in question. The historical analysis showed the heterogeneity to be an outcome of the gradual emergence of concurrent layers of activities, each of them represented by a major event and phase. The events, embedded in historical phases, were experienced and articulated by the members of the Club, and further elaborated by the researcher. The analysis of contradictions revealed that the events and resulting layers could be interpreted as collective solutions to specific problems and tensions faced by participants in the course of collaboration. The major events represented collective learning actions (epistemic actions) in the conceptual framework of the expansive learning cycle.

The analysis in Chapter 5 produced a multi-layered interpretation of expansive learning within the network context. Learning in networks was analyzed as a tension-laden coexistence of layers or levels of collaboration, which laid down the outlines for the rest of my research.

**Learning at the network-ideological level:**

The learning outcome at the network-ideological level was the creation of multi-level collaboration within the Club network. The learning challenge was involved in the tension-laden relations between the network-ideological level and the rest of the levels of learning and collaboration.

**Learning across the levels:**

The network-ideological level, represented by the Club association, can be seen as a space for the showcases of the emerging collaboration. This means that learning at the network-ideological level was eventually dependent on the object creation accomplished at other levels.

*Research question 2: How does the network learn to model its project activity when encountering the firm-network tension? (Chapter 6)*

Learning was analyzed at the *project level* of collaboration. Two customer projects from the history of the Club were examined more closely. The projects could be seen as members' attempts to model network activity. In doing so, the members repeatedly faced the tension between the interests of a single firm and those of an entire network of firms.

In the analysis of the firm-network tension, I interpreted the members to construct three models of the project activity, which I called the upper-plane, the lower-plane, and the middle-plane models. Each of them presented a somewhat different solution to the firm-network tension. The difficulty of implementing any of the models in the customer projects, and, thus, of gaining powerful learning from the projects, was associated with the fact that the models were seldom, if ever, explicitly articulated and submitted to critical examination. I will summarize how each of the models contributed to the customer projects and to learning at the project level.

Customer Project 1 was based on the idea of approaching an established customer company at a new level of collaboration by introducing the subcontracting companies "as the Club," instead of individually "as firms." It was typically an upper-plane approach, communicating at the top management level and at the level of future visions concerning the strategies of interfirm collaboration. This model was challenged by another one: building on existing subcontracting activity and daily contacts at the operational level. This I named the lower-plane model. The frontlines between the upper-plane and the lower-plane models emerged between the members of the Club, but they also presented dilemmas to single members. Models were ideal types that appeared in practice as mixed forms. The postponement, and, finally the cancellation of Customer Project 1, was due to the fact that neither high-level "networking" nor the expansion of the firm-based subcontracting seemed to "hit" the zone of proximal development regarding the relations between the customer firms and their subcontractors and other suppliers. As an outcome of the handling of and reflection on Customer Project 1, a third model, obviously a more realistic one, began to emerge.

A few years later, Customer Project 2 revealed that there was actually a middle-plane model that was followed by the Club firms, when answering the customer's inquiry concerning the outsourcing of production. The middle-plane model included communication through firms and established personal contacts, while the object of collaboration was characteristically appropriated by sub-networks formed by two to four firms. Inarticulate as the model was, the members spontaneously and independently formed two groups, contacting the customer with two separate propositions. The result was confusion and debate within the Club and between the two groups, the Design Group and the Produc-

tion Group. Outsourcing represented a demanding object of collaboration in the zone of proximal development. The Design Group approached the upper-plane model by introducing the Club as one of the actors in the future partnership with the customer and expanding the outsourcing concept to include a design activity. The Production Group was closer to the middle-plane model. Holding on to the outsourcing of production activity, the group introduced four reliable subcontractors, keeping the Club in the background. It was obvious that the lower-plane approach did not play a significant role in this kind of activity. However, it was present in the firms' attempts to secure the continuation of the long-standing subcontracting relationships with Customer 2, which was one of the main motives for taking over the production activity.

**Learning at the project level:**

Learning was triggered by attempts at solving the firm-network tension emerging in collaboration. The object of learning was composed of models, rules and practices to be developed for collaboration within the network. The outcome was the creation of the middle-plane model for the project activity of the Club.

**Learning across the levels:**

The middle-plane model drew on the projects that had been materialized at the production level of collaboration and transferred that knowledge onto the ideological level. Learning was problematic to the degree that the model remained inarticulate and was only partially shared and reflected by the members.

*Research question 3: What is the role of trust and what is its contribution to learning in a complex production process run in a network? (Chapter 7)*

The analysis of the *production level* learning addressed the activities characterized in the history of the Club as invisible collaboration among the sub-networks of the member firms. The members of the Club referred to these activities when constructing the middle-plane model for the project activity of the Club. The object of the study was a collaborative project, managed by one of the member firms, to empty the oil tanks of a sunken vessel. It brought together multiple specialties and technological knowhow, of which I focused on cooperation among the Club firms. The aim of my analysis was twofold: to bring the emerging modes of collaboration to the surface, and to elaborate an object-oriented methodology for studying production and learning in heterogeneous networks. The quest for trust opened up a window to look at both of these concerns.

An object-oriented method proved effective in focusing the research in a complex network setting. The component involving Club-based collaboration was that of a flange joint that was designed and manufactured anew in the process of co-configuration. Two design versions of the component, the unsuccessful Design 1 and the successful Design 2, materialized the preconditions for trust and collaboration, and pointed at the production-level learning challenges.

Neither long-term interpersonal trust, associated with the ideological level of collaboration, nor swift trust of temporary groups (Meyerson et al., 1996) could sufficiently provide the conditions of collaboration at the level of production. Trust could not be transferred from one context to another without problems and breakdowns of the collaborative process. This was so, regardless of the fact that the project manager relied heavily on the trust relations of the Club when building up the project organization. Trust did not ensue swiftly, either, as it was not embedded in a shared and broad view of the object of collaborative production.

**Learning at the production level:**

The production-level trust was best understood as an aspect of the object construction and co-configuration, involving anticipatory communication across the specialties and the phases of the production process. Trust was not so much the precondition for or the outcome of the network collaboration as it was a fragile construction, ever emerging and again fading throughout the process. The demands for co-configuration and anticipatory communication set the major learning challenges at the production level of collaboration.

**Learning across the levels:**

The outcomes of learning in production sub-networks were referred to when constructing the middle-plane model (project level) for collaboration. The member firms' participation in production challenged the collaborative practices carried out at the worker level.

*Research question 4: How can interorganizational collaboration enhance the workers' needs for development and learning at work? (Chapter 8)*

Worker-level learning was interpreted as being in the zone of proximal development (ZPD) of the Club collaboration. Historically, it was situated in the gray area between the consolidation phase of the Club and the threshold of a new cycle of development, bringing forth the business-oriented sub-networks and partnerships, such as the Alliance. The worker-level analysis revealed the emergence of a new intermediate level, *the partnership level* that was crucial in bringing the worker perspective into interorganizational learning and collaboration.

A Developmental Dialogue intervention was implemented in order to test the hypothesis of the zone of proximal development. The intervention succeeded in creating boundary objects that enhanced the workers' dialogue and work redesign across the Alliance firms. Boundary objects made visible the emerging worker perspective and other, oftentimes contradictory, perspectives within the Alliance encountering it. Simultaneously, boundary objects opened up the scope of development and learning in networks.

The analysis of the team project, from the worker perspective, showed that teamwork as such was disposed to strengthen a hierarchical intrafirm organization, which was counteractive to the worker level interfirm collaboration. To overcome the problems in work development and learning, the next step would have led workers to be integrated in the production networks of partner firms and customers. The learning challenge would have gained its contents from knotworking types of practices. This kind of action, however, was not encouraged by the management of the Alliance. The result of the analysis was that the worker-level learning in the network context remained only partially expansive during the period examined.

**Learning at the worker level:**

The developmental intervention was successful in creating boundary objects that enhanced worker-level collaboration and learning. This supports previous research findings, according to which boundary objects are needed to stabilize collaboration across organizations. However, boundary objects (such as the team project) were not powerful enough to integrate the worker-level collaboration in the networked production activities, the so-called first-order work. The learning challenge was incorporated in knotworking, directed at the object of production.

**Learning across the levels:**

The hypothesis on the zone of proximal development was revised and specified in terms of the emerging intermediate partnership level of learning and collaboration. Such an intermediate level was needed to transfer learning outcomes from above. Otherwise, the worker level would have been rather marginal in the learning achieved in the Club network.

## 9.2 Theoretical insights

The ozone hole is too social and too narrated to be truly natural; the strategy of industrial firms and heads of state is too full of chemical reactions to be reduced to power and interest; the discourse of the eco-sphere is too real and too social to boil down to meaning effects. Is it our fault if the networks are *simultaneously real, like nature, narrated, like discourse, and collective, like society?* (Latour, 1993, p. 6)

### Networks – flat and multi-level

The most central finding of my study is associated with the notion of the multi-layeredness of networks. I put forth a way of making the multiple levels visible and interpreting them from the point of view of learning. I derived the levels of collaboration and learning from the empirical analysis of the Club network and, based on the levels, formed a theoretical framework for the analysis and interpretation of the research. How does my notion on this vertical dimension of networks relate to other topological conceptions of networks, namely those of hierarchy and flatness?

The magnitude of hierarchical control, in coordinating the network activities, is one of the criteria of classifying governance structures of networks, as was discussed in Chapter 5 (Gulati & Singh, 1998). Burt (1992), formulating the theory of structural holes, distinguishes between flat and hierarchical network types that offer different kinds of opportunity and constraint environments for managers (or “players” in general terms). Chisholm (1989), on the other hand, contributes to a theory of coordination by informal mechanisms, as opposed to the ideal of a hierarchical control and vertical integration of multiorganizational systems. Actor-network theory (ANT) (Callon et al., 1986; Latour, 1993; 1996; Law & Hassard, 1999) approaches the topological questions from the point of view of overcoming the duality of micro and macro levels of analysis, maintaining that networks are long and remain flat on all points<sup>50</sup>.

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<sup>50</sup> Hierarchy and network are usually seen as separate organizational forms, with a postulation that the latter overcomes the deficiencies of the former. However, it has been argued that the questions of hierarchy and bureaucracy have dimensions worth considering, even in new organizational forms. Adler et al. (Adler, 1993; Adler & Borys, 1996) have analyzed *enabling and coercive bureaucracy*. Nonaka and Takeuchi (1995) discuss a *hypertext organization*, combining a non-hierarchical, self-organizing structure with a hierarchical, formal structure. These aspects of hierarchies are not discussed here, if important and in need of a historically-grounded reinterpretation.

The theories of structural holes, coordination without hierarchy, and actor-network appear as important discussion partners to reflect on the notion of levels. The theories selected address structural and processual issues and the vertical dimension of networks, avoiding the abstractness of the most formal network analyses<sup>51</sup>. I will take up relevant network topological notions of these theories that help formulate my own arguments. The aim is not to put forth a comprehensive presentation and critique of them.

### *Structural holes*

Burt (1992) addresses social networks of players (people and organizations) as a source of social capital, meaning both the *resources* contacts hold and the *structure* of contacts in a network (ibid., p. 12)<sup>52</sup>. The network benefits in the competitive arena are of two kinds, information and control, and, as Burt points out, certain structures can enhance those benefits (ibid., p. 13).

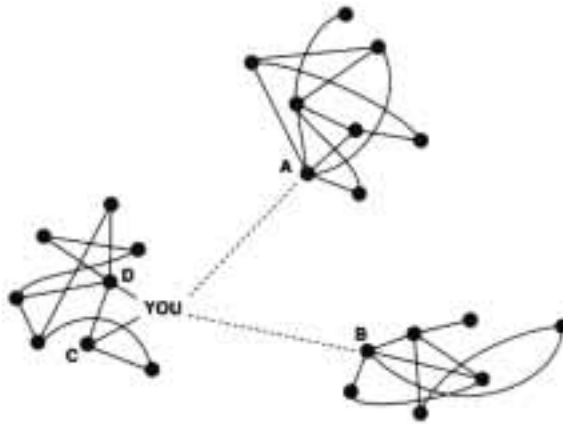
Structural holes deal with discontinuities in social structure. Burt elaborates Granovetter's (1973) weak tie argument. Weak ties connect people in separate clusters (internally connected by strong ties) and are essential to the flow of information that integrates otherwise disconnected social clusters into a broader society, as depicted in Figure 9.1 (ibid., p. 26). Burt wants to emphasize that the causal agent in the phenomenon (that is, the *strength* of a weak tie) is not the *weakness* of a tie but the *structural hole* it spans (ibid., p. 27)<sup>53</sup>.

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<sup>51</sup> Chisholm (1989) makes reference to the developers of network analyses based on a mathematical modeling, such as Lorrain and White (1971) and Knoke and Kuklinski (1982): "Although my use of 'network' is consistent with theirs, and my approach resembles that of graph theory, both the goals of this research and the methodology employed here are simpler. My interest in network morphology has no intrinsic basis (...)" (Chisholm, 1989, p. 79).

<sup>52</sup> Unlike financial and human capital, social capital "... is a thing owned jointly by the parties to a relationship. No one player has exclusive ownership rights to social capital. If you or your partner in a relationship withdraws, the connection, with whatever social capital it contained, dissolves. If a firm treats a cluster of customers poorly and they leave, the social capital represented by the firm-cluster relationship is lost" (Burt, 1992, p. 9).

<sup>53</sup> "It is worth noting, that while the work of Burt and Granovetter has usually been perceived as theoretically compatible, there is one significant dividing point. That is, where Granovetter highlights the benefits that all actors, essentially in terms of reciprocal exchanges, can accrue through networks and the development of trustworthy interactions, Burt's works concentrates [sic!] on the distribution of power, control, and the ability to competitively exploit networks" (Huggins, 2000, p. 29).



**Figure 9.1** Structural holes and weak ties (Burt, 1992, p. 27)

The player whose network is rich in structural holes possesses lots of entrepreneurial opportunity by gaining information and control benefits. In other words, a player has *structural autonomy* in a network (ibid., p. 44). It is evident that hole effects vary depending on a manager's rank in the organization and the environment he or she is operating in<sup>54</sup>. They also vary depending on the structure of the network.

Managers can select either flat networks, in which no single contact is significantly more central than others, or hierarchical networks built around one or two strategic partners (ibid., p. 157). Flat-structured networks can be small, dense cliques (everyone connected) or large entrepreneurial networks (a lot of disconnected contacts)<sup>55</sup>. Hierarchical networks are also two types, based on who is selected as a strategic partner at the top of the network, the boss or someone else (Burt, 1992, pp. 157, 158). These four types are kinds of negotiating environments, with characteristic *hole signatures* for each of them. Hierarchical networks are rich in structural holes in the sense that density is low, but, simultaneously, a player is dependent on and constrained by the strategic partner who

<sup>54</sup> Burt (1992) calls "a social frontier" any place where two social worlds meet. "Relations that cross the frontier involve continual negotiation between the expectations of the manager and the expectations in the world across the frontier" (ibid., p. 163).

<sup>55</sup> In my view, entrepreneurial networks are flat only from the point of view of the player. They are a center-periphery type, "You" in the center, having contacts disconnected with each other. Are these networks not hierarchical from the point of view of Your partner (if the partner, in general, is aware of belonging to a network setting)? The *hole signature* of entrepreneurial networks differs from the hierarchical in that no one contact poses dramatically more constraint than others, and all pose low constraint for a player (Burt, 1992, p. 142).



possesses the holes, other contacts being largely disconnected. It can be concluded that, on the contrary, cliques are lacking structural holes, though Burt is not too explicit regarding this.

Obviously, the Club is a flat-structured network, perhaps initially even a clique type, characterized by strong ties (everyone connected), in that the CEOs of all member companies get together regularly in joint meetings. Structural holes would offer an interesting point of view to the activities of the Club. Was the network in question initially formed as too dense a group, without paying attention to structural holes that it should span to gain information and control benefits? Or was the situation just the contrary: the Club provided the players with structural autonomy that freed the members to try diverse ways to get higher rates of return, which Burt (1992, p. 195) calls *player heterogeneity*? These questions together might contribute to the explanation of the Club, developing from an ideal to a multi-level network. The emerging levels, bringing about heterogeneity, revealed (and certainly created) structural holes that added information and control benefits - social capital, in general - to the Club.

There are also some limitations to applying structural holes. This approach best lends itself to an analysis of the strategies of individuals and single firms, not of the entire networks pursuing a joint production<sup>56</sup>. The emergence of levels would probably be interpreted (besides as player heterogeneity) as a player's, say Manager A's (Chapter 3), strategies to manage the constraint of an absent hole and to develop the information and control benefits of an existing structural hole<sup>57</sup>. The perspective of a single player is not apt to reveal the multi-layeredness of the objects of collaboration. Burt's approach is dynamic, but significantly structural. Structural autonomy and hierarchical networks clearly address power and control issues of competitive strategies in and across networks. But power is only one way of thinking about multiple levels observed in networks. Another way is seeing them as levels of activity, creating different but coexistent systems and objects. An analysis of the heterogeneity of activities, created in interaction across the organizational positions (not only managers at various ranks), requires complementary approaches.

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<sup>56</sup> The empirical analysis focuses on the opportunities and constraints associated with the promotion of managers in large companies. Throughout the study, Burt (1992) makes interesting distinctions between the opportunities and strategies of high-ranking men versus women (in all ranks) and entry-rank men, observed through the data.

<sup>57</sup> The strategic actions in question are *withdrawal* from a given contact, *expansion* in terms of adding a new contact, and *embedding* by reorganizing the existing relationships in a way that gives a player more control (Burt, 1992, pp. 229-238). Withdrawal, expansion, and embedding can further be elaborated as actions of collaborative object construction, thus appearing as promising conceptual tools relevant for the activity theory.

*Coordination without hierarchy*

Chisholm (1989) does not address discontinuities in social structure, but starts from the concept of “multiorganizational suboptimality.” It is the term used to criticize the coexistence of incompatible goals, avoidance of responsibility, and costly duplication and overlap associated with multiorganizational systems in the public sector. The underlying idea is a false assumption that the key to problems of coordination is hierarchical organization (ibid., p. 5). For Chisholm, to coordinate is not to centralize (ibid., p. 13).

Chisholm has studied the transit activities in the San Francisco Bay Area and points out that one of the principal mechanisms, a “shadowy, elusive mechanism,” for coordinating them is a system of informal channels, behavioral norms, and agreements (ibid., p. 11). Informal organization and loosely coupled systems have many virtues, as opposed to the situation in a formal hierarchy. They tend to be flexible and adaptive. Roles and definitions of tasks are continuously redefined on the basis of experience and negotiation. Such organizations are problem oriented and pragmatic (Chisholm, 1989, p. 12). Where Burt (1992) focuses on individuals and single firms pursuing their self-interest, Chisholm addresses shared interests for coordination. The primary motive for those informalities to occur is to *reduce uncertainty* through interorganizational coordination (Chisholm, 1992, p. 38).

Because they are flat, they cannot and do not coordinate by hierarchy.

But they are marked by extensive lateral coordination, which occurs at virtually every level of activity - producing an overall system that is quite resistant to serious disruption (Chisholm, 1989, p. 12).

What the levels of activity mentioned are is not made clear. It seems that these kinds of concepts are systematically avoided when the main task is to show the superiority of loosely-coupled systems over hierarchy. But there is one such concept worth taking up in this discussion, namely the *subsets* of informal channels, of which the whole system is composed (Chisholm, 1989, pp. 78-85). Within the larger informal network of the Bay Area transit system, three subsets were observed: operations/maintenance, planning, and management. Examples of coordination across organizations within each subset are given. A question arises, what is meant by informal communication when, in fact, it often revolves around formal tasks of coordination. Chisholm claims that the type of informal tie is closely linked to function. To get advice, people use ties between individuals of equivalent formal status and similar areas of activity. When exchanging sensitive information, or bypassing formal channels, ties tend to be between

people of different formal status, obviously both within and across subsets, even though Chisholm does not specify this.

Throughout the study, Chisholm (1989) discusses informal mechanisms as contrasted with formal ones, flatness contrasted with hierarchy (cf. Burt, 1992). Making the informal formal should be carefully considered. He suggests using the general rule that no more machinery be used than is absolutely necessary to provide a satisfactory level of coordination (Chisholm, 1989, p. 191).

Successfully maintaining a loosely coupled organizational system is very different from decentralizing an existing system that has been organized as a formal hierarchy. It is more difficult to flatten a system that has been peaked than to maintain an existing loosely coupled system. This fact alone should make us think very carefully about consolidating loosely coupled systems; should we decide eventually that we have erred, we may not be able to retrace our steps (Chisholm, 1989, p. 189).

As a network, the Club differs from the complex multiorganizational transit system that developed over time in a certain geographical area. Nevertheless, the question of formalizing the informal without building a hierarchy is highly relevant from the point of view of the Club. This was one of the main dilemmas of modeling the project activity (Chapter 6). The levels of collaboration, in this framework, might be interpreted as subsets of informal communication and coordination for making up the entire system of the Club. The members were wise enough not to formalize the collaboration that emerged among the subnetworks, and the Club remained a loosely-coupled system.

The problem in Chisholm's pattern of thinking stems from his way of interpreting subsets as channels of communication. Alternatively, they might be interpreted on the basis of differing objects of collaboration. Chisholm does not focus on the object; perhaps it was so obvious in his research case, namely the public transit system of the San Francisco Bay Area. In the case of the Club, that kind of relatively clear and concrete umbrella task was missing. It is hard to give reasons why any of the levels would be more informal than, say, the Club organization, founded as an outcome of the network-ideological level collaboration.

In sum, coordination without hierarchy enriches the picture of interaction taking place in multiorganizational systems, as compared with the hierarchical, manager-oriented approach of structural holes. On the other hand, it seems to overlook the significance of the objects of collaboration as a motivating force for the informal practices of the subsets.

*Actor-network: local and long*

Actor-network theory (Callon, 1986; Callon et al., 1986; Latour, 1993; 1996; Law & Hassard, 1999) brings into discussion elements that can be read as critical comments on the structural network analysis (Burt, 1992), on the distinction between the formal and informal (Chisholm, 1989), and on approaches based purely on human interaction without observing material artefacts (Chisholm, 1989; Burt, 1992).

You do not have to choose your level of analysis at any given moment: just the direction of your effort and the amount you are willing to spend. Either you can, intensively, know much about little, or, extensively, little about much. Social worlds remain flat in all points, without there being any folding that might permit a passage from the “micro” to the “macro.” For example the traffic control room for Paris buses does indeed dominate the multiplicity of buses, but it would not know how to constitute a structure “above” the interactions of the bus drivers. It is *added* on to those interactions. The old difference of levels comes merely from overlooking the material connections that permit one place to be linked to others and from belief in purely face-to-face interactions (Latour, 1996, p. 240).

By adding nonhumans, machines and facts, to networks, collectives have changed their topography, Latour (1993) argues. The distinctions of global-local or universal-contingent are no longer valid. Networks are *lengthened*; they should be looked at as one looks at gas lines and sewage pipes, not as transformable into systematic and global totalities (Latour, 1993, p. 117)<sup>58</sup>.

Thus, in the case of technological networks, we have no difficulty reconciling their local aspect and their global dimension. They are composed of particular places, aligned by a series of branchings that cross other places and require other branchings in order to spread. Between the lines of the network there is, strictly speaking, nothing at all: no train, no telephone, no intake pipe, no television set. Technological net-

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<sup>58</sup> These metaphors have been persuasive to followers of ANT to the extent that Law (1999) warns about the risk of oversimplifying them: “...sociotechnical world is *topologically nonconformable*; if we try to imagine that it is topologically complex, a location where regions intersect with networks. (...) But – big but – *this sensibility for complexity is only possible to the extent that we can avoid naturalizing a single spatial form, a single topology* (Law, 1999, p. 7; italics in original text).

works, as the name indicates, are nets thrown over spaces, and they retain only a few scattered elements of those spaces. They are connected lines, not surfaces (Latour, 1993, pp. 117, 118).

Callon (1986) presents some central concepts of ANT and applies them to the case of the electric vehicle, the VEL. The *actor-world*, contributing to the project in question, included “the electrons that jump effortlessly between electrodes,” as well as “the consumers who reject the symbol of the motor car and who are ready to invest in public transport” (ibid., p. 23). Similarly, the Ministry of the Quality of Life (regulations about the level of acceptable noise pollution), Renault (a manufacturer of car bodies), improved lead accumulators, and post-industrial society are listed. None of these ingredients can be placed in a hierarchy, or be distinguished according to their nature, Callon claims. “The activist in favour of public transport is just as important as lead accumulators which may be recharged several hundred times” (Callon, 1986, p. 23).

An equal status of all elements means that, in the absence of one ingredient of the actor-world, the whole would break down. The construction of an actor-world is not a predetermined process. Its heterogeneous entities are drawn from a plurality of different and incommensurate worlds (ibid., p. 24). This is done by *translation*. This includes, first, translators, spokesmen of the entities to be enrolled, second, a geography of obligatory points of passage, a process by which the actor-world renders itself indispensable, and, third, displacement by which entities are converted into inscriptions and movements of materials and money. Translation cannot be taken for granted. It may be challenged by the very entities to be enrolled. In Callon’s example case, Renault challenged the VEL and started to speak for its own network. The actor-world, constructing the VEL, began to fall to pieces.

The VEL existed in 1973. In 1976, it was attacked on all sides and now exists only in the limited form of a commercial vehicle equipped with lead accumulators. Translation becomes treason (...), once an enrolled entity refuses to enter the actor-world in order to expand into others. Since entities are not easily translated, the destiny of most spokesmen is thus to be brutally contradicted (Callon, 1986, p. 25).

Actor-networks form when the entities of the actor-world are juxtaposed in a network of relations<sup>59</sup>. ANT adds complexity of networks, compared with the

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<sup>59</sup> Callon (1986) actually builds more on the concept of actor-world, but points out that the terms actor-world and actor-network draw attention to two different aspects of the same phenomenon and that they are used interchangeably in the volume in question (Callon, Law & Rip, 1986). Later, the term actor-network has been dominant. For instance, Law & Hassard (1999) do not discuss the “actor-worlds.”

structural theories: “Thus a network is durable not only because of the durability of the bonds between the points (whether these bonds concern interests or electrolytic forces) but also because each of its points constitutes a durable and simplified network” (Callon, 1986, p. 32).

Methodologically, the actor-network theory takes a big leap from structural network analyses. Heterogeneity, which in Burt’s work referred to the variety of strategies of an individual player, means here that material entities should be linked as actors of equal status to humans. This socio-material or sociotechnical perspective, together with the principle of following the actors in their translation endeavors, makes a network analysis dynamic and processual. In fact, this is what I tried to do in the analysis of the Club. I followed not only the members and subgroups, but also the outcomes of the Club collaboration, projects, models, products, and components. The strength of the emerging ties within the Club or between the Club and its partners can only be assessed in terms of the objects and outcomes of collaboration.

However, my activity-theoretical understanding of heterogeneity differs from that of the ANT<sup>60</sup>. The social and the material may have an equal status in the process of production, but heterogeneity refers, above all, to the object of collaboration. What I defined as levels would in an ANT-framework only reflect the direction of my effort and the amount of energy I was willing to spend, as Latour (1996) suggests. It even might be difficult to convince an actor-network theorist that the distinct levels take shape within one and the same network. Starting from the network-ideology, the Club failed to translate the needs of customers, or the idea of product development, or expectations of member firms. Just like *Electricité de France* with its plan for the VEL, the Club was unable to determine the identity of the elements of the actor-world and to regulate their behavior and evolution (Callon, 1986, p. 25). But, unlike the VEL, the Club did not fall apart. At the network-ideological level, it continued to exist in a more limited form than was initially planned (without the Club Invest Ltd., for instance). But the work of translators bore fruit at other levels, which in no way were disconnected from the Club context.

Actor-network theory is similar to the two other theories (Burt, Chisholm) in two respects. First, it has little to offer to understand the vertical dimension of networks beyond the power hierarchies (it rejects the existence of hierarchy and levels as a false distinction between micro and macro sociology). Second, uncertain and contradictory as the entities of the actor-world are, the object of collaboration, nevertheless, is given in technological networks (“the VEL”). Finally, seeing networks as endless processes is both the strength and weakness of

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<sup>60</sup> Miettinen (1999) has an illuminating comparison of the activity theory and actor-network theory, including discussion on heterogeneity, principle of generalized symmetry, and the meaning of human and nonhuman entities in an innovation network.

the theory. I suggest that object orientation offers a promising starting point for developing network analyses that combine structural approaches (“object-world”) with process analyses (“object-constructing network”).

### *Dynamic interplay of levels*

In this study, I have presented an alternative view on multiple co-existent levels of a network. It is an alternative view in the sense that it suggests a non-hierarchical way of looking at levels, determined neither by power and control nor by structural-functional levels of organization. The perspectives of shop-floor workers simply differ from those of a managers’ club. It is not useful to lump them together under the general title “learning in networks,” even though they intertwine in everyday practices. To conclude, I will specify the levels of collaboration and learning as *levels of network activity that create their own objects*. A dynamic aspect stems from analyzing these levels together in a tension-laden juxtaposition and interaction. This can only be done by means of a historical approach, by following the processes taking place within a network.

The need to define multiple levels, in the case of analyzing the Club, came from the original obscurity of the object of collaboration. In much of network research, the object is assumed to be known and, thus, more or less taken for granted. I argue that a lot of network dynamics is missed by overlooking the multi-layeredness and emergent nature of the object. The possibility of identifying multiple levels within one and the same network reveals the simultaneous fragility and robustness of collaboration. In a breakdown of one level, collaboration will be carried over at another level of activity.

When articulating the levels as those of network activity, I will rename them according to the activities taking place on each level. The articulation of the levels of network activity summarize the findings of this study by slightly generalizing them, while still keeping the connection to the empirical reality from where the levels were drawn. Thus the levels of activity are:

- 1 Network organization activity
- 2 Project-modeling activity
- 3 Partnering activity
- 4 Production activity
- 5 Developmental activity (second-order work)

At first sight, defining a level in terms of one activity seems to be contradictory to the unit of analysis for *the third generation activity theory* (discussed in Chapter 2), comprised of at least two systems of activity oriented toward a partially

shared object (Figure 2.5). It is true that each of the levels might be deconstructed and divided into a set of multiple horizontally-interrelated systems, represented by manager-members, member firms, customers' organizations, suppliers, consulting experts, and so on. In this study, I have taken the perspective of the participants within the Club and the Alliance at each level and tried to figure out what they have been pursuing through collaboration. By doing this, I am not disputing long and flat networks but rather suggesting *a vertical dimension to be integrated into the third generation activity theory*.

This idea is substantiated by means of the detailed presentation of levels in Table 9.1. The context of each element of activity, presented in Table 9.1 in a slightly ideal-typical form, should be evident from the cases analyzed in chapters 5 to 8. A couple of comments are still needed. The subject is defined in terms of a collective actor embedded in the context of the Club and Alliance. For analytical purposes, each activity might also be examined from the point of view of actions of individual participants, such as the Project Manager of Alpha who contributed to the production activity. The object of activity is defined in general terms, whereas in the empirical analyses I zoomed in on the details bounded by phases, events, and turning points. Tools and rules are drawn from empirical cases as well. Their mutual relationship might be debated. In some cases, it is a matter of interpretation whether an element, for instance, an agreement, is seen as one of the rules or tools. In the column for the division of labor (Table 9.1), I have only listed the parties involved in the community, not specifying the main tasks and roles of each. The links between the levels of activity are illustrated by arrows showing the direction of learning.



Table 9.1 **Levels of network activity**

Level of activity	Element of activity						Links across levels
	Subject	Object/ Outcome	Tools	Rules	Community	Division of labor	
<b>1 Network organization activity</b>	All manager members	Network organization/ Multi-level activities	Collective presentation: meetings PR activity	Trust Cooperation Statutes related to associations	All member firms	Members Chair Board Coordinator	↓ Creation of levels ↑ Showcase of learning outcomes of other levels
<b>2 Project-modeling activity</b>	Subnetwork managers	Customers/ Middle-plane model	Interpersonal presentation: negotiation	Flexibility Speed Competition possible	Subnetwork firms	Member Subnetwork	↑ Showcases for network organization ↑ Learning from production activity
<b>3 Partnering activity</b>	Subnetwork firms	Partnership	Interfirm development	Agreement	Partner firms (subnetwork + customer)	Subnetwork Customer	↓ Learning from project-modeling ↓ Creating developmental activity
<b>4 Production activity</b>	Subnetwork participants	Order/ Product	Co-configuration Tools of design & production	Cost efficacy Usability Anticipatory communication	Project firms (subnetwork + suppliers + customer)	Managing firm Subnetwork Suppliers Customer	↑ Knowledge for project-modeling ↓ Creating need for developmental activity
<b>5 Developmental activity (Second-order work)</b>	Interfirm knots	Work practices in network	Developmental dialogue Boundary objects	Zone of proximal development	Alliance firms	Alliance management Firms Knots	↓ Learning from partnering activity ↑ Creating knotworking for production

## Expansive learning and network interpretations

I applied the theory of expansive learning on the analysis of interaction taking place in a network context. Earlier, this model has mainly been applied on processes bounded by one central activity system<sup>61</sup>. What kinds of new perspectives, if any, did my study open up? I take up two analytical tools elaborated in the study. The first one is the notion on *levels* of collaboration embedded in the cycle of expansive learning. Having elaborated the vertical dimension of the network activity, I will discuss how two-way learning (from above and from below) contributes to the theory of expansive learning. The second one is the *turning points* bounding “micro-level” interaction episodes that involve attempts at the expansion of the object.

*The levels* of network activity bring a new perspective into expansion and expansive learning. The cycle model was designed by Engeström (1987) to capture collective learning processes of communities and organizations, having been formed to carry out certain societal ends. Levels may help to capture learning processes in a situation in which the activity is scattered across multiple systems - the situation addressed by the third generation activity theory (Engeström, 2001a).

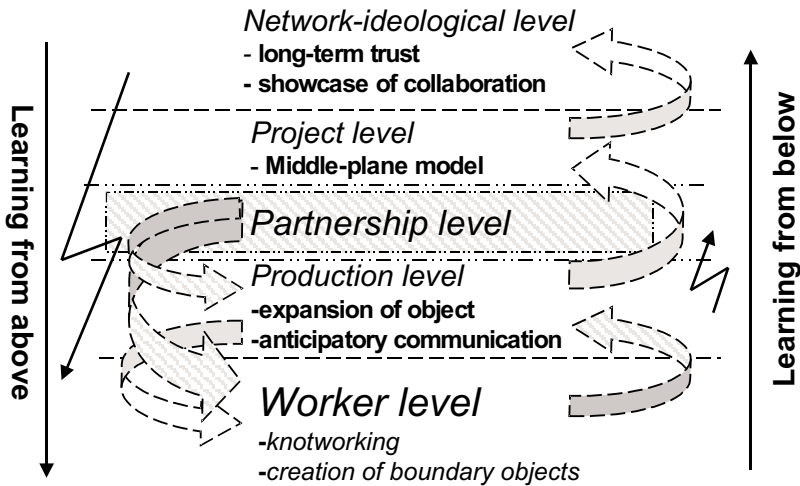
In the case of the Club, the levels provided integration and revealed the richness of network resources available for the participants. For the researcher, the levels opened a window to the variety of network interpretations. At the end of each empirical chapter 6 to 8, I formulated a hypothesis on learning across the levels of collaboration. The three hypotheses are integrated in the Figure 9.2. The third hypothesis, based on the emergence of the partnership level (see Chapter 8), points at the proposed zone of proximal development for learning in networks. It is marked with gray-banded surfaces in Figure 9.2.

Levels also hint at an alternative course of development, namely that of disintegration and regression (lightning-shaped arrows in Figure 9.2). Is this what we will witness more and more frequently in the transition from single organizations to networks? Each epistemic action of the cycle is critical in sustaining and carrying on a shared learning process. Will that process go on and generate new levels of activity, or will it lead to a fragmentation? In the previous section, it was pointed out that the levels are compensatory and provide robustness and the continuation of collaboration. This is a central finding in my study that I will put forth as a contribution to the theory of expansive learning. *Integration of a vertical dimension in expansive learning may even strengthen the dynamics of the*

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<sup>61</sup> Recently, Engeström (2003) has discussed and elaborated the horizontal dimension of expansive learning in a multiorganizational context.

cycle, by introducing the idea of concurrent and contradictory movement of learning from above and learning from below.



**Figure 9.2** Learning across the levels of collaboration

*Turning points* take place within the steps of the cycle (epistemic actions), gradually working the transition towards the next step, the next phase. The notion of the critical nature of epistemic actions is, in miniature, also valid regarding turning points. Each turning point is a potential point for either expansion, or narrowing, or the disintegration of the object. An intermediate form between expansion and disintegration would be an individual attempt at expansion that does not meet a response among the community. Either it is overlooked, silenced or loudly objected to. This kind of attempt at expansion was Mikko's initiative for practicing teamwork by taking care of the maintenance of machines (Chapter 8, Excerpt 8.18).

A turning point is connected to a type of organizational change that Haavisto (2002, p. 305) has previously described as gradual, consisting of small but interconnected alterations and adjustments "from below." In the established court activity, she states, it may be the everyday work practices that over time conflate to contribute to a radical sea-change of the activity. I argue that, even in the course of that kind of gradual change, there are moments of potential expansion, manifesting as turning points. These moments give a rhythm to minor alterations by opening up a (potential) qualitative change in the activity observed.

However, in order to catch the rhythm by turning points, we have to be patient enough to focus our analysis on a micro-scale interaction, taking place in the everyday work practices. The precision of turning points depends on the data gathered. Thus, in my analysis, the most minimal unit of a turning point con-

sisted of a single speech turn bounding an episode of a collaborative discourse (e.g. Chapter 8, Excerpt 8.6), whereas the turning points bounding the design episodes (Chapter 7) were constructed from the multi-perspective post-hoc accounts given by participants.

### Zone of proximal development: partnering?

The global emergence of partnerships and alliances dates to the very historical period addressed in my study. Doz and Hamel (1998) illustrate the change: “Ten years ago, when we asked participants in our executive seminars whether their firms needed alliances, the answer was most often ‘No.’ (...) Today, our question is purely rhetorical” (ibid., p. *xiii*). Spekman et al. (2000) perceive the same phenomenon, but note that the term alliance is overused and involves much confusion. They claim that it is time for a “second generation” discussion on partnering, which means a *shift from alliance formation to alliance management and competence*<sup>62</sup>. I take the idea of generations and argue that it is well-founded to talk about *first generation partnering* and *second generation partnering*.

From the local perspective of the Club, this development was not yet clearly in view at the beginning of the 1990s. The birth of the Club (Chapter 5) reflected first generation partnering, in other words, the wave of alliance and network formation. The concept of “partnership” was not widely adopted. Among the members, one manager appeared as a forerunner in developing the partnership concept for his subcontracting business from the late 1980s (Member 9 in Chapter 6, expressing network-ideological tones in Excerpts 6.11 and 6.13). In a couple of years, the situation changed, and around 1997 alliances and partnering really surfaced as a topic within the Club. In my view, it became a prominent element of the zone of proximal development. Thus, my study reports a change that took place both in the network participants’ perspectives and in the researcher’s thinking.

What is characteristic for partnerships in the light of my research data, and on what basis do I specify them as signifiers of the present learning challenges? Partnering sub-networks are much more focused and object oriented than the initial Club association. The oil-removing project (Chapter 7) was an anticipatory case, while still based, to a great extent, on interpersonal relationships and familiarity. As the case showed, implementation of trust proved problematic in collaboration, which suggests that a partnership might be needed to regulate col-

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<sup>62</sup> “We see this book as a ‘second generation’ alliance book that raises the alliance discussion to the next level - the concept of alliance competence” (Spekman et al., 2000, p. *viii*, also p. 27).

laboration in this respect. Contracts between alliance partners are *incomplete agreements* (Spekman et al., 2000, p. 151) that cannot set a precise value on future assets. Contracts help partners deal with uncertainties, creating novel dialectics of short-term and long-term trust.

The teamwork project of the workers of the Alliance (Chapter 8) strengthens the image of partnership as a missing link between the network ideology and the project level, on the one hand, and the production and worker levels, on the other hand. To generate networking on the “grassroots” levels, second-order work was needed. Here the role of the Alliance was decisive. It enabled participants to expand collaboration beyond the managers, which for the Club appeared to be an elusive goal.

The Club and the Alliance represent successive phases of networking, the first and the emerging second generation partnering, respectively. It is not reasonable to claim the superiority of one network type over another. Network typologies, discussed in Chapter 5, are ahistorical and confusing rather than illuminating in understanding the dynamics of change in networks. Even the different forms of partnerships, that have grown out of the Club collaboration, have proved to be contradictory and fragile.

Looking at the development beyond the time frame of this study, it may be pointed out that the Together Project, underlying the case reported in Chapter 8, contributed to the fusion that combined the Alliance firms to form a larger company in 2000. Thus, the development led from a small-firm network to a partnership and eventually to a new, larger-scale hierarchical organization. Another new company, founded by the Production Group as a result of the customer’s outsourcing procedure (Chapter 6), was based on a close partnership between the customer and the outsourced unit. What could be observed at the interfaces of collaboration, constructing the everyday practices of partnership, was a recurrent confrontation of hierarchical control (old organization), and germs of trust, co-configuration, and anticipatory communication not strong enough to sustain the relationship in the crisis of a market situation. The development, in this case, led from a loosely-coupled group of Club firms to a focused partnership and, finally, to disintegration<sup>63</sup>.

These examples, and there are many others, show that *second generation partnering is only emerging, shaping the learning challenges that the participants and activity systems encounter in interfirm networks*. As other researchers have shown, the challenge is that of alliance management and competence. Following the line

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<sup>63</sup> I had an opportunity to observe these developments by participating in research projects carried out in collaboration with these firms. The projects were the *Together Project* 1998-2000 (Toiviainen, 2002), and the *Knotworking Project* 2000-2002 (Toiviainen & Toikka, 2002), both financed by the Workplace Development Programme of the Ministry of Labor (Alasoini et al., 1997; 1998).

of thought adopted in this study, *management* should be understood in a broad sense, embracing agencies in all work communities at different positions in a network. Trimming network structures to serve the strategies of individual manager-players is not a challenge of tomorrow. *Competence*, in turn, should include both interaction in complex social settings and the organization of the material production of complex objects. In the course of this study, I have discussed the need for co-configuration and knotworking as articulations of the learning challenge. These and related concepts have been in the focus of interest lately in the activity-theoretical research community that I am participating in (e.g. Engeström et al., 1999). Much exploratory work and a more profound historical insight are needed in order to gain a deeper understanding beyond the promising concepts.



## 10 Evaluation of the Research Process

### Validity

*Multiple voicing* is one of the means of enhancing validity in qualitative research (Gergen & Gergen, 2000). It is widely used in activity-theoretical studies, this analysis included, as an in-built methodological principle. Like any methodological solution, multiple voicing involves complexities, which Gergen and Gergen aptly describe. Whose voices are speaking in the research? Is the researcher's voice one among others or does (should) it have privileges? Each individual participant is polyvocal: which of the voices is speaking and what is suppressed? Are all sides given their due?

It is true that, regarding the case analyses in Chapters 6 – 8, voice is given selectively to some of the firms and their key actors. Inclusion of certain parties has, however, not based on a researcher's personal preferences or special easiness of interaction. The cases were selected by following the emerging objects of collaboration. This was preceded by an exploratory phase in which I communicated with the entire membership and the coordinator who helped me choose collaborative projects for the investigation.

Typically, the investigator functions as the ultimate author of the work (or the coordinator of the voices) and thus serves as the ultimate arbiter of inclusion, emphasis, and integration. The author's arts of literary rendering are often invisible to the reader (Gergen & Gergen, 2000, pp. 1028, 1029).

These questions have no ultimate answer. What can be made visible are the theoretical-methodological postulates that guide the inclusion and exclusion. I have attempted to increase visibility by discussing these postulates through this report, not only in the introductory chapters, but also in connection with each empirical analysis.



Another means of convincing the reader of the “correctness” of the rendering is to embed the voices in the context of activity. “The description of persons, places, and events has been the cornerstone of qualitative research,” writes Jane-sick (2000, p. 393). In activity-theoretical research, the description of the object is even more important. I have aimed at explicating the object construction at some length in each case.

The power of the investigator to pursue multiple voicing should not be exaggerated. Even the researcher’s own voice may be suppressed in ethnographic studies (Coffey, 1999; Davies, 1999; Ellis & Bochner, 2000). The *method of narration, story telling*, is one way of being heard, as a personal author (Rapport, 2000). Ellis and Bochner (2000) demonstrate the method through a discussion between a student and her supervisor.

When Sylvia looks at me questioningly, I say, “You know - the story evokes in readers the feeling that the tale is true. The story is coherent. It connects readers to writers and provides continuity in their lives.” When I see a look of recognition on Sylvia’s face, I continue, “Even realist ethnographers, who claim to follow the rules for doing science, use devices such as composites or collapsing events to tell better stories and protect their participants. Yet they worship ‘accuracy’ in description” (Ellis & Bochner, 2000, p. 753).

Thus, a story is true, coherent, and provides continuity. I agree that a story is also composed to protect participants. The researcher not only considers what is included in the report as “true,” but also what cannot be told in order to maintain the privacy of people and to keep a certain distance from the events. The latter aspect, keeping a distance, is not mentioned by Ellis and Bochner. On the contrary, romantic story-telling runs the risk of losing the distance, and presenting participants, the authors included, in a harmonious and ideal light. As a “realist ethnographer,” I have tried to avoid this by following, though not excessively “worshipping,” the rules of reasoning based on evidence.

Besides story-telling, reports of researcher interventions are a natural way of giving a voice to the author, as is done in the cases reported in Chapters 6 to 8. Even in those cases, reporting my own talk is exceptional. The context of intervention implies that the researcher is present and her contribution is crucial in the construction of the events analyzed.

Multiple voicing addresses mainly the question of internal validity, including how credible the events described and the research outcomes appear to be. The external validity, that is, to what extent the results may be generalized to other cases, has to do with the longevity of my observer position and interaction with

the field, which helped assess the significance of the observations. In the activity-theoretical study, in particular, a careful historical analysis serves external validity by embedding the case in a broader societal context (Chapters 3 and 5).

### **Risks and limitations of research**

In ethnographic studies, researcher bias is discussed as a potential source for limitations and problems of research. As Chambers (2000, p. 862) puts it, “The potential for perceptions of researcher bias in applied ethnographic research and practice extends beyond issues of reliability and validity,” addressing questions such as: Should an ethnographer be regarded as an advocate of the people he or she studies (Chambers, 2000)? Does an ethnographer’s gender matter in doing fieldwork and interpreting findings (Angrosino & de Pérez, 2000)? To be sure, these are issues encountered during a research project.

As I point out in the next section, I did represent the network in some occasions, but my advocacy was confined to the notions on learning and collaboration. I was aware of major business and economy-related issues attached to interfirm networks reaching beyond my competence area. In interventions, however, researcher bias is apparent in a different light. To some extent, an interventionist has to be biased and an advocate of the people whose activity he or she is stepping into. I recognize this pattern of action in the context of the Together project of the Alliance, when speaking for the developmental projects of the workers, which were planned during the Developmental Dialogue (Chapter 8). There is a risk of having lost a critical stance towards the worker perspective that was the object of intervention and interpretation.

As to the gender issue, it is true that female researchers, and female participants in general, belong to a minority in the field of metal industries. How did this affect my study? Certainly, being a female researcher sometimes helped contacting people – both men and women – and entering into open discussions. By the same token, I might have been forced to speak up for my study and intentions rather determinedly on some occasions. The gender bias as such might easily lead to an endless speculation. I see it as one aspect, important though, among other attributes, such as age, family relations, social background, and philosophy of life, shaping the personal identity of an ethnographer.

The excessive discussion on researcher bias and position (e.g. Denzin & Lincoln, 2000) seems to overlook one of the principal aspects of an ethnographer’s work: the fact that, most of the time, she is doing fieldwork alone, if not lucky enough to have resources to recruit a research team<sup>64</sup>. This brings both limita-

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<sup>64</sup> A researcher’s insider/outsider position in relationship with the setting members, the “practitioners,” has been discussed, e.g. Reis Louis & Bartunek (1996); Kemmis & McTaggart (2000).

tions and risks to the study. For me, the limitations were very practical in nature. I had to make decisions and choices concerning the activities to be followed and observed in the network, often in an intuitive manner. There were no opportunities for negotiation or the allocation of work. The risks are associated with the interpretation of “lonely” observations. I tried to avoid this risk by presenting my “raw material” in a researcher collective and by discussing the ideas that emerged during the fieldwork. Through the study, it has been my aim to avoid an excessive interpretation of somewhat provocative findings.

### **The changing role of a researcher-interventionist**

Kirsten Foot (2001) points out that cultural-historical activity theory (CHAT) is a practical theory, not only offering a researcher a set of analytical tools, but also facilitating, even impelling a researcher to reflect on one’s own participant-observer role and dialogical interplay with the “practitioners” of an activity. It is time to reflect upon my changing position as a CHAT researcher, in relation to the empirical field at different phases of the study. Interaction with multiple parties in varying situations has been a learning process worth examining.

I go back to the situation where it all started, namely to the member meeting quoted right at the beginning of this book (and again in Chapter 6). I presented myself to the members of the Club and explained the aims of my study. Some of my ideas have held true until the end of this project, such as studying production projects and widening the perspective beyond the managers. Some have been dropped, as the comparison with Japanese small-firm networks. What expectations and questions did my work encounter then, in November 1995?

First of all, and not surprisingly, the members were concerned with the feedback and learning they might possibly get from the project.

Do you mean that, by concentrating on the object, the firm, a certain part of it, that you also give feedback to the gang you have studied and possibly interviewed and observed in a given situation? (*Manager A*)

You talked about a learning organization, and I think I have at least a teachable organization in Tampere [city]. So, do we, us Clubbers, gain knowledge from this research on what type of organizations these [firms] are, what we could do with them, and how to develop them? (*Manager C1/Member 1*)

Feedback to and knowledge-sharing with the firms and workgroups have been materialized unevenly within the Club, which was already apparent at the

start. For example, Manager C1's firm was not included in the analyses, except concerning its subsidiary companies in Chapter 7. On the contrary, the Alliance firms, managed by Manager A and his partners, participated in the Developmental Dialogue interventions and a number of other developmental activities I contributed to. To the Club as a whole, I gave two major oral presentations, reported in Chapter 6, and a summary paper on my interpretation concerning the history of the Club. In the more or less formal situations of the meetings, I could participate in several discussions and tell about my study and observations. The final evaluation on the quality and quantity of my feedback is left to the members of the Club. The idea, put forth by Manager A, of organizing a learning seminar around my research findings, is still worth considering.

The questions that followed concerned the themes of the study, the focus of my interest, and the developmental work research approach I was going to apply. Having a background in behavioral sciences, would I analyze the "mental life" of an entrepreneur in a small business? Talking about work research, did I refer to the Taylorist time-motion studies ("Kellokalle" in Finnish) type of work research that had prevailed earlier in the manufacturing industry? My answer to both of these questions was "no." Associated with the "mental life" aspect was the question of to what extent I would address the cultures of these subcontracting firms and the meaning of networking.

I think it's rather rare in Finland, and certainly in many other places, that such a large number of entrepreneurs, owner-managers, are networked. We haven't got that kind of culture, I think, here in Finland (Member 9).

This was a relevant aspect to be discussed further. On the whole, the discussion was useful in defining the shared meaning of my research project. But it was only a starting point, lacking concrete elements. I was assigned a researcher role in the same vein as the university students of technology that came to the firms to complete the thesis required for their diploma. The interventionist role was not discussed. One additional point taken up at the start-up discussion was the publicity the Club would gain through my study.

...hopefully the reputation of this group will grow greater than ever. We are already regarded as a rather extraordinary being [for example] in Salo [city]. As I told some of you, I visited there on Tuesday, and, let's say, our reputation has really improved. They are starting a similar type of activity, and [when listening to them] the events we organized four years ago really came to mind. As if a mirror had suddenly been put in front of me (Manager A).

From my point of view, I have contributed to the publicity of the Club mainly in two ways: through scientific and other forums. First, I have presented my research findings to international conference audiences (and to Finnish students), focusing on interfirm networks and organizational learning. More important for the members of the Club have been the general presentations I have given to Finnish business and administration communities. I have participated in seminars addressing issues of networking and learning and written articles on the Club collaboration for professional and industry magazines. In addition, I have supplied the Club with several English presentations for its PR activities.

My subjective assessment of this publicity work is positive, also in terms of collaboration between the Club and the researcher. To give an example, I was asked to present the activity of the Club to a group of European delegates visiting the FIMET in October 1999. This demonstrates the trust the members of the Club showed in my work, notwithstanding the fact that they sometimes were rather astounded by my critical observations concerning the contradictions and tensions of collaboration (reported in detail in this study).

Perhaps with the work of the students of technology as their frame of reference, the members were confused to a certain degree by my focusing on problems, conflicts and even failures. On the other hand, meeting debates show that they were able and ready to deal with the tensions I provoked through my presentations, seeing them as topical from the point of view of the business activity and networking.

The interventionist role was assigned to me as a part of the project researcher task in the Together program of the Alliance (1998-2000). This stabilized my status as a network participant and gave me better access to the data I needed to explore the worker level of collaboration. Simultaneously, the links with the Club gradually became more occasional, but I kept in contact with the coordinator. According to her, the members considered me as “being a permanent fixture” of the Club (e-mail in January 1999).

Feedback from the participants of the Developmental Dialogue (DD) process was encouraging, at first. The extension of the perspectives beyond the firm and work group was experienced as positive. For many of the workers, the methods of the DD offered the first opportunity to present personal ideas, in an organized way, to the rest of the group. What was not reported in connection with the worker perspective (Chapter 8) was the fact that I could not provide continuity for the DD process in the Alliance firms. This made the participants more critical towards the developmental approach.

The commitment and support by the management is often emphasized as a precondition for a long-term development in organizations. In the Together project, our development team was strongly supported by the “main architects”

of the Alliance, Managers A and B, and many other managers. We were also given resources needed for the costly training sessions.

Besides the managers, a group of business consultants were involved in the project. We pursued a good collaboration with them, regardless of the fact that our DD procedure represented a rather strong intervention in many of the activities run by them (for example, the team trainer in Firm B, Chapter 8). As a researcher-interventionist, I also encountered a competitive stance instead of a collaborative one regarding the joint project resources. A case in point was that the DD process was given up, partly due to the marginal status it was assigned in an extensive educational package introduced by a business management consultant. Large as this package was for the small units of the Alliance, it was never implemented. This taught me the importance of taking small piloting steps in developing work in networks. In fact, piloting was the strategy supported by the management group and followed during the Together project. Regarding the DD process, and the “grassroots” development of work in general, the transition from limited experiments to ambitious concepts of the alliance management seemed to be problematic and vulnerable.

### **In the researcher’s zone of proximal development**

From these backward-looking reflections I turn to some future visions perceptible for an activity-theory researcher. Having brought to an end a long research project, actually embracing several minor cycles of analysis, I need to reorient myself as a student of work, collaboration, and learning that take place in the context of evolving networks. I think that the question is, to a great degree, about a researcher’s relationship with the communities and practices she participates in.

The fact that our analyses, more and more, address elusive activities emerging in networks certainly affects the role of a researcher-interventionist. Personally, I see this issue as outlining the zone of proximal development of my work. On the one hand, a network researcher, as a boundary spanner, has a vantage point in relation to multiple activity systems entangled in networks. On the other hand, the more complex settings she deals with, the more she is impelled to delineate her position and give up control of the developmental processes she is contributing to. These issues should be discussed in the research community by articulating alternative strategies to be considered and followed in field-work and project coordination.

As a network participant, a researcher is no exception, in other words, she is subjected to the challenges of learning in networks much in the same way as those being analyzed. My question is therefore: what are the levels of research activity I should address and develop in my work? Such candidate levels are network-creation, analysis, and the development of research work in terms of co-configuration and knotworking.

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