

# **THE ROLE OF INTER-FIRM LEARNING IN THE CONSTRUCTIVE PROCESS OF ORGANIZATIONAL CHANGE**

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## **ABSTRACT**

Inter-organizational collaborative networks are often seen as dynamic entities able to evolve over time. Investigating the development of interfirm collaboration implies understanding of how changes unfold and what are the generative mechanisms underlying these changes. Grounded on theories of organizational change, this paper develops a propositional framework that examines the 'constructive mode' of inter-firm collaboration process. Namely, it focuses on how changes in collaborative relationships interrelate with different learning processes. Also the framework provides a possibility to link micro and macro level factors responsible for collaboration development. The argument presented throughout the paper indicates the importance of avoiding fragmented or partial analysis and calls for more systematic and multifaceted approach to collaboration process. The application of the proposed framework is illustrated through understanding the examples of three different inter-organizational collaborations. Implications for theory and managerial practice are also discussed.

## 1. INTRODUCTION

Inter-organizational collaborative networks, such as strategic alliances and joint ventures, are often seen as dynamic structures able to change and evolve (Lorange and Roos 1992; Inkpen 1995). Indeed, the research has shown that interfirm formations are highly unstable, undergoing a wide range of changes during their development (Yan 1998; Yan and Zeng 1999; Das and Teng 2000; Reuer and Arino 2002; Reuer, Zollo et al. 2002). However, while flexibility is a networks' fundamental property, the issues of how the network form is actually built and controlled and how it can develop over time have not yet been sufficiently addressed and incorporated into theory (Alter and Hage 1993; Parkhe 1993; Ebers 1997).

We build a framework that explores the interaction between changes occurring in collaboration and inter-organizational learning processes. The contribution of this paper lies in, firstly, unpacking the 'black box' of collaboration through focusing the attention on social and cognitive processes involved and, secondly, providing the building blocks for a theory that could explicitly address a variety of change processes and their interrelationships.

The paper is structured as follows. First, we review process approaches to inter-organizational collaboration, and then we examine the studies that explicitly addressed learning in inter-firm context. Next, we present the framework derived from the review and illustrate its application. Finally, we address the theoretical and managerial implications of the framework.

## 2. PROCESS APPROACHES TO INTER-ORGANIZATIONAL COLLABORATION.

Investigating the process of interfirm collaboration development implies understanding of how changes unfold, and what the underlying generative mechanisms of these changes are. Studies taking a dynamic perspective of collaborative arrangements have employed different approaches to explain this process. We rely on Van de Ven and Poole's (1995) typology of process theories (see Figure 1) and their notion of *composite theories* of organizational change to review these studies.

Van de Ven and Poole have identified four schematic-types of development and change in organizations: life cycle, evolution, teleology and dialectics. In each type, a different motor, or generative mechanism, governs the process of change. Thus, in evolution process theories, environmental selection and competition generate change. In life cycle theories, natural and institutionalized rules prescribe the course of change. In the dialectic approach, confrontation and conflict trigger development. Finally, in the teleological approach, change takes form of social construction through convergence to consensus.

Two analytical dimensions used for this classification are 'unit of change' and 'mode of change'. Change processes go on at many organizational levels, from individuals and groups to populations of organizations. The classification distinguishes whether the change occurs in a single organizational entity or among two or more entities. Furthermore, prescribed and constructive modes of change are distinguished in terms of whether the sequence of change events is prescribed a priori, or whether it is constructed and emerges as the change process unfolds.

Figure 1. Process theories of organizational development and change.

Unit of change	Multiple entities	EVOLUTION	DIALECTICS
	Single entity	LIFE CYCLE	TELEOLOGY
		Prescribed	Constructive
		Mode of change	

**Source** Adapted from Van de Ven and Poole (1995).

In many cases, the complexity of change process implies that more than one motor (life cycle, evolutionary, teleological or dialectical) may be in operation. As a result, observed processes are multilayered and complex and might be better analyzed using *composite theories* derived from the interplay among simpler change motors (Van de Ven and Poole 1995). Table 1 shows various process approaches to inter-organizational collaboration and the combination of the change motors emphasized by the authors.

First, we consider the ‘single-motor’ approaches, which are those that focus mainly on one of the possible four motors. Early studies of the dynamics of inter-organizational collaboration tended to emphasize driving forces at the macro level. D’Aunno and Zuckerman (1987) and Kogut (1988) are examples of the single-motor life-cycle approach. They describe the development of inter-firm formations as sequences of creation, maturation and termination stages.

From 1990s, there were a number of studies focusing on the phenomena from micro perspective. Among single-motor approaches, some employ teleological models to explain development. Parkhe (1991), Doz (1996) and Kumar and Nti (1998) share the concern with the adaptation ability of inter-firm collaboration to make adjustments necessary for a relationship to progress. Larson (1992), Ring and Van de Ven (1994), Boddy et al (2000) and Lubatkin et al (2001) emphasize the relational dimension. They perceive inter-firm arrangements as ‘negotiated orders’, where the convergence to consensus depends on the interactions between parties and the emergence of an interfirm level knowledge structure.

Another common approach to internal dynamics of collaborative relationships explores the inherent conflict between individual firms' competitive interests and common interests faced by the partners. This dilemma generates dialectical processes within inter-organizational domain (Zeititz 1980). For instance, Hamel (1991), Inkpen and Beamish (1997), Makhija and Ganesh (1997) and Park and Ungson (2001) emphasize the opportunistic hazards that lead to asymmetrical learning among partners. Such *learning race* behavior may result in the shift in bargaining power disturbing the status quo of the relationship. Khanna et al (1998), Larsson et al (1998) and Jones et al (1998) go further exploring how the contradictions in partners' interests govern the sequences of confrontation, conflict and synthesis in collaboration development.

The remaining single-motor study by Koza and Lewin (1998) focuses on the co-evolution of collaboration with partners' organizations and their environment and starts to address an alternative source of change. Furthermore, we identified three studies that explicitly addressed more than one motor of change. Arino and de la Torre (1998) view collaboration development as a cycle of self-reinforcing loops of learning, evaluation and adjustment through which collaboration progresses over time. They also observe a number of exogenous factors, such as environmental changes and changes in organizations' strategies, that trigger the evaluation process. Buchel (2000) examines this developmental cycle further. She identifies phases of convergence and divergence, which take place around the conflicts arising in the conditions of two different organizations working together. This constitutes another driving force behind the stages of collaboration development. Moreover, Das and Teng (2002) place the path of collaboration development into a co-evolutionary framework. They link the stages of alliance life cycle with the environmental factors, namely partner firm characteristics.

As the majority of the studies highlighted in Table 1 are single-motor, we can conclude that the diversity of the sources of change has been overlooked. Such approaches can lead to oversimplification and emphasis on one aspect of change at the expense of others (Van de Ven and Poole 1995). The task of process research therefore, is "to identify the variety and mixture of causes of change and to explore through time some of the conditions and contexts under which these mixtures occur" (Pettigrew 1990:269).

This paper calls for more systematic and multifaceted approach to collaboration development. We argue that, in order to study nonlinear dynamics of organizational change, it might be useful to decompose complex process of change into simpler ones, understand how each one develops, and then combine the parts specifying the relationships among motors and levels of analysis. We start to decompose complex process of interfirm collaboration by examining the role of learning in the process of change. As the review of process studies of collaboration indicates, learning plays a crucial role in the internal dynamics of inter-firm relationships. In this manner, our analysis focuses on the constructive mode of change (see Figure 1), which emerges through the purposeful social construction among individuals and is based on what was learned through the process.

Table 1. Various process approaches to inter-organizational collaboration.

Authors	Interplay among motors			
	Life-Cycle	Teleological	Dialectical	Evolutionary
D'Aunno and Zuckerman (1987)	√	-	-	-
Kogut (1988)	√	-	-	-
Parkhe (1991)	-	√	-	-
Hamel (1991)	-	-	√	-
Larson (1992)	-	√	-	-
Ring and Van de Ven (1994)	-	√	-	-
Doz (1996)	-	√	-	-
Inkpen and Beamish (1997)	-	-	√	-
Makhija and Ganesh (1997)	-	-	√	-
Jones et al (1998)	-	-	√	-
Khanna et al (1998)	-	-	√	-
Larsson et al (1998)	-	-	√	-
Kumar and Nti (1998)	-	√	-	-
Arino and de la Torre (1998)	-	√	-	√
Koza and Lewin (1998)	-	-	-	√
Boddy et al (2000)	-	√	-	-
Buchel (2000)	√	-	√	-
Lubatkin et al (2001)	-	√	-	-
Park and Ungson (2001)	-	-	√	-
Das and Teng (2002)	√	-	-	√

### **3. INTERFIRM LEARNING AND CHANGE PROCESS**

In this section, we examine the studies of inter-firm collaboration that have explicitly addressed learning processes. Our purpose is to explore the relationship between learning and the changes occurring in collaboration. The developmental process of collaboration involves a wide range of changes, such as renegotiations of agreements, reconfiguration of management structures, along with other possible alterations in the relationship between the partners. All these may have a significant effect on the venture's performance (Yan and Zeng 1999). Therefore, to capture these changes we define collaboration conditions as the characteristics of inter-firm relationship at any given moment of its existence.

In this way, the review centers on: collaboration conditions; learning processes addressed by the authors; and modes of change highlighted in the studies (see Table 2). Through this review, we identify four major dimensions of collaboration conditions and three distinct learning processes.

#### **3.1 Collaboration conditions**

Having considered a variety of collaboration conditions depicted in the studies, we group them along the following four dimensions: knowledge type; inter-organizational diversity; governance; and relational quality. We argue that these dimensions systematically capture the key aspects of collaboration conditions addresses in the literature.

The type of knowledge refers to the degree to which it is tacit or objectified (Szulanski 1996). This is a fundamental characteristic of collaboration as it determines to great extent the challenges to governing the relationship (Grandori 1997; Gulati and Singh 1998). Makhija and Ganesh (1997) and Lubatkin et al (2001) examined the impact of the knowledge type involved on the way how learning takes place. Based on this particular dimension along which knowledge can be characterized, the argument produced is that more tacit knowledge presents greater challenges to be shared across organizations and the appropriate governance mechanisms are crucial for this process.

Inter-organizational diversity is conceptualized as inter-firm differences that influence the patterns of interaction between collaborating partners. Here, we follow Parkhe (1991) and distinguish between two types of inter-firm diversity. The first implies the existence of complementary resources and interdependencies, which enable joint learning among the partners. Arino and de la Torre (1998), Khanna et al. (1998), Inkpen and Beamish (1997) and Makhija and Ganesh (1997) address this particular type of inter-firm diversity. The second type of diversity refers to the differences in the partners' organizational characteristics. Thus partners may differ along several dimensions, such as societal culture (that moulds epistemological structures of perceiving and thinking), national context, organizational culture and, finally, organizational practices on strategic and operational levels. Boddy et al (2000), Buchel (2000) and Doz (1996) emphasize the significance of such organizational differences for the collaboration process.

Table 2. Approaches to inter-organizational learning processes and change.

<i>Authors</i>	<i>Collaboration conditions</i>	<i>Learning processes</i>	<i>Modes of change</i>
Arino and de la Torre (1998)	Resource interdependence; Governance; Relational quality.	Learning to trust; Ability to adjust.	Self-reinforcing dynamics of learning action-reaction loops.
Boddy et al (2000)	Differences in organizational cultures; Governance; Relational quality.	Learning to collaborate; Ability to adjust.	Unilateral and bilateral adjustment to success requirements.
Buchel (2000)	Differences in belief structures, experiences and interpretations; Relational quality.	Learning to collaborate; Development of joint organizational actions.	Convergence and divergence around arising conflicts.
Doz (1996)	Expectations; Governance; Organizational context of the partners.	Content learning; Learning to trust; Behavioral learning.	Adjustment to success requirements.
Hamel (1991)	Learning intent; Transparency; Receptivity.	Asymmetrical learning.	Confrontation as a result of the shift in bargaining power.
Inkpen and Beamish (1997)	Resource interdependence; Learning ability of the partners; Relational quality.	Differential learning.	Confrontation as a result of the shift in bargaining power.
Khanna, Gulati et al. (1998)	Common versus private benefits.	Asymmetrical learning.	Resource allocation by the partners for learning.
Kumar and Nti (1998)	Absorptive capacity; Governance; Learning strategy.	Learning to collaborate; Differential learning; Ability to adjust.	Discrepancies assessment.
Larsson, Bengtsson et al. (1998)	Receptivity; Transparency; Relational quality.	Collective learning; Asymmetrical learning.	Contingence upon the previous combination of learning strategies.
Lubatkin, Florin et al. (2001)	Knowledge type; Absorptive capacity; Differences in belief structures; Governance; Relational quality.	Reciprocal learning; Asymmetrical learning; Learning to collaborate; Learning to trust.	Development of an interfirm level knowledge structure.
Makhija and Ganesh (1997)	Knowledge type; Resource complementarities and interdependence; Governance; Learning ability of the partners;	Differential learning.	Confrontation as a result of the shift in bargaining power.
Parkhe (1991)	Inter-organizational diversity.	Amount of adaptation.	Diminishing of the inter-organizational diversity.

Other authors addressed inter-organizational diversity along both dimensions. For instance, a widely accepted view is that learning is conditioned by the organization's ability to identify, assimilate, and utilize knowledge. Cohen and Levinthal (1990) defined the ability "to recognize the value of new, external knowledge, assimilate it, and apply it to commercial ends" as *absorptive capacity* (1990:128). Lane and Lubatkin (1998) developed a concept of *relative absorptive capacity* to embrace the particular situation of inter-organizational context. According to their findings, relative absorptive capacity was determined by two sets of factors. The first indicates the relation between partner's knowledge domains in terms of their similarity and relevance to each other. The second concerns the differences in firms' organizational structures and management practices. The latter factors were recognized as important learning determinants, because the degree of formalization and centralization in task allocation and decision-making influenced the interaction patterns between the participants. These defining dimension of relative absorptive capacity are similar to those of inter-organizational diversity as developed by Parkhe (1991).

Governance refers to formal or informal negotiated governance mechanisms as well as the interface structure and managerial mechanisms adopted for the inter-firm co-ordination. Relational quality is an elusive but important concept. It reflects the interplay between trust and opportunism present in a relationship and also the balance of competitive and co-operative elements of collaboration. The authors widely addressed the issue of governance and relational quality. They particularly emphasize the role of social interaction dynamics as an important source of regulative mechanisms for inter-firm co-ordination. They recognize that trust based on inter-personal relationships perform as a powerful regulative mechanism to deal with the uncertainties. This implies that firms do not evaluate collaboration solely on economic criteria but also on the criterion of "fair dealing". Therefore, the assessment based on the perception of justice by partners is equally necessary for the continuation of a venture. Therefore, the way, in which firms evaluated collaboration, is conditioned by the quality of a relationship developing between them.

### **3.2 Learning processes**

Learning processes are stimulated by the presence of the partners. They influence and are influenced, at the same time, by the patterns of interaction between firms that could provide or fail to provide a synergy needed for learning to occur. Hence, inter-organisational learning can be conceptualised as the collective acquisition and development of knowledge through construction and modification of inter-organisational environments and working rules (Larsson, Bengtsson et al. 1998).

The selected studies emphasize a number of learning processes. The most frequently addressed process is content learning. The typical assumption is that the firm's goal is to absorb or acquire its partner's knowledge. Consequently, the main theme is the presence of asymmetrical or differential content learning that potentially benefits one of the partners (Hamel 1991; Inkpen and Beamish 1997; Makhija and Ganesh 1997; Khanna, Gulati et al. 1998; Kumar and Nti 1998). The issue of collective or reciprocal learning (Larsson, Bengtsson et al. 1998; Lubatkin, Florin et al. 2001), however, is rarely addressed in this literature.

Process learning means that through inter-firm interactions the partners learn how to collaborate and how to trust each other. A number of studies examine process learning (Doz 1996; Arino and de la Torre 1998; Kumar and Nti 1998; Boddy, Macbeth et al. 2000; Lubatkin, Florin et al. 2001). These studies suggest that the uncertainty produced by the complexity of behavioral dynamics in collaboration can be better managed by the controls based on social norms and reciprocity. This emphasis given to the informal means of coordination implemented through personal interactions indicates the importance of the processes occurring on the operational level of inter-organizational networks. Therefore, the view shared by the authors is that collaboration emerges and develops along with people's engagement through collective sense making and the establishment of psychological contracts.

The third distinct learning process, we identify in the review, is behavioral learning. This refers to the action or behavior needed for changes to occur (Doz 1996). It is an important component of collaboration because relationship dynamics are strongly influenced by the amount of learning and adaptation occurring between the partners (Parkhe 1991; Arino and de la Torre 1998; Kumar and Nti 1998; Boddy, Macbeth et al. 2000). Behavioral and process learning are clearly interdependent. However, we find it important to distinguish them as process learning can occur without following behavioral learning. The partners may develop trust and common understanding of issues involved in collaboration, but still not act in order to continue partnership. Process and behavioral learning are different from content learning as they depend upon sustaining a number of behavioral and attitudinal changes (Mintzberg and Westley 1992; Weick and Quinn 1999). Process and behavioral learning are responsible for the collaboration conditions to be adjusted and the next cycle of relationship development initiated. Some of the conditions can be changed deliberately by organizations. For example, governance mechanisms can be renegotiated establishing new terms for a partnership. Others can only be changed as a part or result of learning. For instance, if firms do not engage in joint sense making and learning about how to interact successfully, they may find working together increasingly frustrating. These dynamics can be self-reinforcing leading to sustained commitment over time, or can fail resulting in dissolution, depending on the organizational ability of partners to adjust.

### **3.3 Modes of change**

In their typology of process theories, Van de Ven and Poole (1995) indicate that organizational change may occur in prescribed or constructive mode. The studies selected in Table 2 view the development of inter-organizational collaboration as the constructive mode of change based on learning processes. In teleological approaches (as classified in Table 1), process learning and behavioral learning are crucial for the process of adjustment and adaptation that organizations undergo in order to achieve common goals. For instance, Parkhe (1991), Doz (1996), Kumar and Nti (1998), Arino and de la Torre (1998) and Boddy et al (2000) focus on the ability of the partners to assess the differences and adjust to success requirements.

Furthermore, content and process learning frequently serve as triggers for conflicts that arise along the collaboration development. One typical situation described in the studies, which take a dialectical approach, consists of asymmetrical content learning leading to the confrontation between the partners. The reason for the confrontation is the misbalance in the

partners' interdependence produced by the learning race. The result is renegotiations of the relationship, many times to the advantage of one partner, as demonstrated by Hamel (1991), Inkpen and Beamish (1997), Makhija and Ganesh (1997) and Khanna et al (1998).

Process and behavioral learning also play a role in the process of syntheses. Buchel (2000) explores how firms can overcome the differences and develop joint organizational actions in order to deal with the emerging conflicts. Understanding this complex relationship between learning processes and the development of inter-firm collaboration implies more detailed examination of how collaboration conditions mould learning processes and how learning process, in their turn, change collaboration conditions. This is the issue we address in the next section.

#### **4. FRAMEWORK AND ITS APPLICATION**

Having considered collaboration conditions, learning processes and change modes addressed by previous studies, we suggest that there are a number of limitations in these approaches. First, collaboration conditions have not received adequate research attention. The conditions are the key to understanding the types of learning process that are going to unfold and the transition from one collaboration stage (characterized by a certain set of collaboration conditions) to another. However, the majority of studies consider only one or another subset of conditions at a time. Change in inter-organizational relationships is better treated as a multi-faceted phenomenon (Yan and Zeng 1999); hence, integrative studies that examine the interactions among multiple dimensions are specially needed.

Furthermore, only a few studies examined a variety of learning processes (content, process and behavioral learning) and how they interact as collaboration develops. As a result, the relationships between collaboration conditions and learning processes remain mainly unexplored. Based on three learning processes and four dimensions of collaboration conditions identified in the review, we propose here a matrix of twoway relationships between conditions and inter-organizational learning processes. Figure 2 describes the relationships between learning processes and changes in collaboration conditions. Upward arrows indicate which collaboration conditions influence different learning processes enabling or inhibiting them. Downward arrows indicate which learning processes can induce or block changes in which collaboration conditions.

We illustrate the application of the proposed framework employing three case studies from the literature. Each case study examines different inter-organizational collaboration. The first case by Doz (1996) describes an alliance between AT&T and Olivetti and demonstrates how the lack of content, process and behavioral learning blocked the changes in collaboration conditions necessary for successful outcomes. We also examine the reasons why inter-organizational learning did not take place. The second case by Buchel (2000; 2002) is a history of a joint venture between Ericsson and Hewlett-Packard. The evolutionary path of the joint venture indicates the important role of the relational quality in providing basis for behavioral learning to occur. Finally, the third case by Boddy et al (2000) explores a partnering relationship between Sun Microsystems and its supplier Birkbys Plastics. The history of this collaboration highlights how appropriate governance structures can contribute to process and behavioral learning and, in this way, potentially bridge the gap between apparently incompatible organizational contexts.

In the following sections, we present a new interpretation of the data from the case studies. In this way, the proposed framework allows cross case comparison of different inter-firm collaborations.

Figure 2. The relationships between inter-organizational learning processes and collaboration conditions.

	<i>Content Learning</i>	<i>Process Learning</i>	<i>Behavioral Learning</i>
<i>Knowledge type</i>	///	///	///
<i>Inter-organizational diversity</i>	///	///	///
<i>Governance</i>	///	///	///
<i>Relational quality</i>	///	///	///

#### 4.1 AT&T - Olivetti

Doz's (1996) studied the evolution of AT&T – Olivetti alliance in the area of mini- and microcomputers. AT&T was a US company originally operating in telephone market and trying to enter computer industry. Olivetti was an Italian leading supplier for computer and office electronics. Organizational diversity between AT&T and Olivetti consisted of high resource complementarities, which was promising for a partnership to be productive. However, this characteristic was combined with deep differences in national and organizational cultures. Olivetti was an aggressive, fast-moving, entrepreneurial organization, while AT&T could be characterized as having professional, technocratic management culture.

At the beginning of collaboration, governance comprised rigid contractual agreements with no specific organizational interaction process and little exchange of personnel. The incompatibility of organizational processes did not allow the partners to establish a dialog in order to resolve arising conflicts. The lack of appropriate governance structures combined with high inter-organizational diversity resulted in low content learning as the partners were too different in their emphasis with no coordination mechanisms at that time to support co-

operation. Also this combination of collaboration conditions resulted in low process learning, as there was little interaction among employees.

Low content and process learning led to the partners' increasing disappointment with each other. For instance, Olivetti's top management became worried about AT&T ability to manage the business successfully, which damaged competence trust (Sako 1992). In this way, the relational quality deteriorated further as the suspicions about competencies grew. Olivetti, for example, was concerned with the possibility of AT&T terminating the partnership or even trying a takeover. The partners recognized the difficulty in inter-partner coordination, however, because of low relational quality, no action was produced that meant low behavioral learning. As a result partners were not able to adjust their behaviors and governance structures to overcome the unfortunate combination of collaboration conditions.

#### **4.2 Ericsson – Hewlett-Packard**

Buchel (2000; 2002) conducted a detailed study of the joint venture between Ericsson and Hewlett-Packard. The joint venture was created to operate in the emergent market of network management platforms and solutions for telecommunications. The partner organizations presented differences along various dimensions. First, they had different knowledge domains, which was the driving factor for collaboration as complementary resources were to be put together in order to develop a new product. Second, the partners differed in their national cultures. Ericsson was Swedish and HP partner was from France. Furthermore, the organizational cultures also differed as the two companies operated in different markets. The tradition of telecom market was to produce tailor-made solutions working closely with the customers. HP, contrarily, used to work with standardized products.

During the formation stage of the partnership, the governance of the relationship was implemented through joint working groups and interactive meetings where representatives from both organizations were put together to develop a business plan for the joint venture and set common goals. The employment of such governance structure permitted to overcome relatively high inter-organizational diversity and resulted in high content learning, which consisted of the development of a detailed business plan. It also allowed process learning to occur. Intensive process learning based on the inter-personal interactions produced high relational quality at this stage of collaboration. Such conditions permitted the collaboration to develop to the next stage.

When joint venture started operational activities, collaborative development was organized in functional project teams with members from both partners. At this stage, the nature of knowledge involved in a new network platform creation implied interpretation by the partners based on their belief structures and experiences of product development. Differences in organizational cultures of the partners resulted in differences in their interpretations and produced misunderstandings about crucial stages of product development. Also, HP limited the exchange of information with the partner in order to avoid the leaking of proprietary knowledge. This introduced suspicion and mistrust in the relational quality of collaboration. The combination of such conditions slowed down content learning, which manifested itself in the delays in product development. Low content learning led to further deterioration of relational quality on the operational level and an emergence of a conflict about the roles and responsibilities of the partners in the development of the platform.

However, on the management level, the partners continued close interaction making an effort to discuss issues of conflicts and resolve differences. At this point, more opportunities for socializing were introduced for the members of the joint venture. Through organized seminars and workshops, the participants could engage in informal communications, which would provide a ground for joint sense making and sharing of beliefs during face-to-face meetings. Adjusted governance structures allowed further process learning to occur; i.e. common understanding of issues involved in collaboration on operational level was developing. Process learning improved relational quality. With better relational quality people engaged in behavioral learning by changing attitudes towards the partner and engaging in joint organizational actions. Behavioral learning decreased to some extent organizational differences, which led to resolution of the emerged conflicts. This process continued as inter-organizational diversity posed more challenges on operational level during joint venture development.

As the partnership developed further, external factors effected the interdependence balance between the parent companies. HP has concluded the internal development of a concurrent platform for network management, which put under a question mark the need for the joint development with Ericsson. Under this new condition the partners started to question reciprocity of each other contributions. The outcome consisted of renegotiations of the ownership structure. Initially, Ericsson owned 60% and HP 40%. Ericsson now owned 81% and HP 19%. This major change led to the combination of collaboration conditions, which resulted in eventual dissolution of a venture.

#### **4.2 Sun Microsystems – Birkbys Plastics**

Boddy et al (2000) examined the development of a partnering relationship in a supply chain. They studied the collaboration between Sun Microsystems and its supplier Birkbys Plastics. Sun Microsystems is of US origin and is a leading player in the electronics industry. Birkbys Plastics is a Japanese owned UK based company that makes plastic moldings. The incentive for collaboration for Sun was the establishment of a local supplier with more predictable costs. For Birkbys the collaboration meant widening its customer base.

Besides the fact that two companies operated in completely different markets, the companies had distinct organizational cultures. Sun was a research-based dynamic business promoting flexibility and fast adaptability to change in their employees. Birkbys, on the other hand, was a very old-established engineering company, which was initially perceived by Sun as inflexible and slow to change. Such inter-organizational diversity could potentially be a problem for successful operation of the partnership. Thus at the beginning Birkbys was not able to respond quickly enough to Sun's demands. However, the companies made an initial effort to set governance structures able to support co-operative behavior. Both companies created new roles in which people had clear responsibilities for managing relationships with the partner. Also new systems were set to support new processes. The appropriate governance structure and the need to overcome inter-organizational diversity intensified process learning. High process learning resulted in the development of informal networks based on close interpersonal links. This boosted relational quality. People became content with more direct dealing process and open relationship with the supplier.

High inter-organizational diversity continued to pose challenges to collaboration. Sun still insisted that Birkbys employees were not empowered enough to make decisions and that they should have a bigger authority to deal with operational situations. As the climate of the relationship was generally good, the companies continued to make effort to change accordingly to the success requirements. Such behavioral learning involved unilateral as well as bilateral adjustments. Birkbys introduced weekly meetings dedicated to Sun related issues. Both sides also set a number of weekly and monthly meetings involving employees from Sun and Birkbys dedicated to co-ordination of the partnership. In this way, improved communications facilitated the management of collaboration. Another consequence was the improvement of decision-making processes at Birkbys. Engineers now could authorize actions having the support and information provided by the meetings. This self-reinforcing process gradually was bridging the gap between the two organizational contexts and allowing collaboration to continue.

## **5. DISCUSSION AND CONCLUSIONS**

A key issue involved in the study of the developmental process of inter-organizational collaboration is the understanding of how changes unfold and what are the motors governing these changes. We conceptualize change in collaboration development as a modification in the set of collaboration conditions that characterize an inter-firm relationship at any given time. Four main dimensions of collaboration conditions have been developed from the review of process studies of inter-firm collaboration: knowledge type, inter-organizational diversity, governance and relational quality. We link these conditions to the distinct learning processes (content, process and behavioral learning) in a recursive process framework. This recursive interaction is found to explain how collaboration conditions and learning processes shape, and in turn, are shaped by one another.

The empirical encounters examined in the previous section support a number of propositions about the internal dynamics of collaborative relationships.

1. Higher inter-organizational diversity is likely to induce higher process learning.
2. Higher inter-organizational diversity, combined with the necessity to share more tacit knowledge, is likely to block content learning.
3. Under the condition of high inter-organizational diversity, the existence of appropriate governance structures is a necessary condition for content and process learning to take place.
4. Higher process learning supports the development of relational quality. Higher content learning also contributes to better relational quality.
5. Relational quality is a crucial condition for behavioral learning to occur.
6. Behavioral learning is the main internal source of changes in inter-organizational diversity and governance.

Above we explored only some of the recursive loops presented in the framework, as they constitute the main focus of attention in the analyzed cases. However, the internal dynamics of collaboration can be explored further.

For example, the pattern of rivalry between partner firms also effects collaboration development and activates other recursive loops of the framework. Namely, combined with other collaboration conditions, the prevailing competitive component of relational quality can boost content learning because partners try to outlearn each other. Such asymmetrical content learning may produce a misbalance in inter-firm interdependence giving an origin to opportunistic behavior. In this case, content learning tends contributes negatively to relational quality.

In sum, the proposed matrix of two-way relationships allows better understanding of, first, how learning processes mediate changes along collaboration development and, second, how learning processes themselves interact and evolve. The framework may also be applied to a wide variety of collaborations. It goes beyond the classification of interfirm partnerships based on ownership structures and allows more refined analysis of collaboration's properties.

Another implication of the framework is that it makes it possible to link micro and macro level factors responsible for collaboration evolution. Collaboration conditions allow the integration of different levels of analysis and focus not only on individual and group dynamics but also to include wider organizational and strategic contexts. As several studies indicated (Arino and de la Torre 1998; Buchel 2000), learning processes are not the only source of change in collaboration conditions. Exogenous factors can also induce changes. Thus, inter-firm interdependence can change not only as a result of content learning but also because of the shift in partners' strategic orientations or market conditions. In this way, collaboration development must be placed, first, in the context of other adaptation choices of the firm. Inserting collaboration conditions in a wider evolutionary framework allows doing it. Second, the conditions and learning processes must be considered along life cycles of an inter-firm relationship.

More studies are needed to examine what collaboration conditions under what circumstances are more influenced by external factors or by learning processes within partnership. For instance, knowledge type is likely to be strongly influenced by the stage of life cycle of collaboration and not so much by learning processes. As the case study by Buchel (2000; 2002) demonstrated, the operation stage of collaboration involved knowledge type more specific to organizational contexts of the partners demanding a great deal of interpretation. While, in the formation stage, partners applied less context specific knowledge about business plan development.

The argument developed throughout this paper indicates the importance of avoiding fragmented or partial analysis of collaborative relationships. We examined in detail the constructive mode of change (see Figure 1). However, the proposed framework allows an integration of a variety of change motors by defining the dimensions of collaboration conditions that can be examined in the constructive as well as prescribed mode of change.

While we have emphasized the implications of the proposed framework for theory and future research, we also take a position that it is useful to managers. While executives spend a significant amount of their time on developing collaborative partnerships plans and drafting

legal documents, they spend much less on actually managing an alliance. The emphasis on processes given in our framework refines earlier work and contributes to better appreciation of the key issues involved in collaboration management. Namely, what enables the partners to adjust the relationship to changing conditions and benefit from collaborative efforts? In this process, it is essential to be aware of potential changes and how to react to them. Moreover, managers of inter-firm partnerships should be able to acknowledge the nature of change they are seeking to implement. Understanding of the dynamic nature of collaboration and the role of learning provides valuable insights in the process of the day-to-day running of the collaborative projects.

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