Chapter 77
Knowledge Management under Coopetition

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ABSRACT

This article deals with Knowledge Management under Coopetition and, in this context, illustrates the concept of Coopetitive Learning and Knowledge Exchange Networks (CoLKENs). It investigates the setting for inter-organizational knowledge management initiatives focusing on issues related to cooperation-competition-dilemmas and intentional/unintentional knowledge transfer.

Category: Organizational Aspects of Knowledge Management

INTRODUCTION

Behind the emerging digital façade, companies have started to operate in a distributed fashion. The intricate connectivity among these firms implies the exchange of valuable resources like knowledge and information. Such 'cooperation' or 'collaboration' is what enables organizations and individuals to make decisions collectively, learn from one another, communicate effectively, and thus create knowledge (Brown & Duguid, 1991; Huber, 1991; McDonald, 1995; von Krogh & Roos, 1995; Grant & Baden-Fuller, 2004).

However, cooperating organizations often simultaneously compete (coopetition). While reciprocal knowledge sharing may enhance the total and individual added value, inter-firm knowledge sharing may also affect the uniqueness and thus competitive contribution of a firm's knowledge repository. Opportunistic behavior of counterparts may erode anticipated benefits of cooperation and result in unevenly distributed value.

The inherent balancing act between cooperation and competition requires designing and implementing specific management processes to enable economic value maximization for participating individuals and firms. The value-driven

DOI: 10.4018/978-1-59904-931-1.ch081

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balancing act is becoming increasingly relevant in business practice.

The article introduces the scientific literature on Knowledge Management under Coopetition and then describes the concept of 'Coopetitive Learning and Knowledge Exchange Networks' (CoLKENs), their components and their generic structure. It reviews CoLKEN fundamentals and components and suggests a CoLKEN taxonomy. Key research questions are followed by generalized key insights from studying CoLKENs as the setting for Knowledge Management under Coopetition. The article then examines the levers for managing CoLKENs and closes with future trends and brief conclusions.

BACKGROUND

The following literature review provides broad definitions and discussions relevant to Knowledge Management under Coopetition.

Fundamental Components of Knowledge Management under Coopetition

Knowledge is a complex concept and difficult to define, and when seen from a management perspective it exhibits unique properties that are distinctly different from the ones of traditional corporate resources, such as land, labor and capital. Intellectual resources are not naturally scarce (Suchmann, 1989; Argyres & Silverman, 2004); knowledge may increase in value the more it is used, with investment in knowledge and knowledge-creating capabilities characterized by increasing returns (Teece, 1998; Smith, Collins, & Clark, 2005). These properties tend to make knowledge less amenable to management (Polanyi, 1966; Hedlund, 1994; Nonaka, 1994; Boisot, 1995; Grant & Baden-Fuller, 2004).

Who are appropriate knowledge agents for Knowledge Management under Coopetition? Who is intellectually capable, the organization or its individual employees? Does knowledge reside at individual and the organizational level? Among others, Drucker (1993) or Grant (1996) stress the predominant importance of individuals. Others (Nonaka & Takeuchi, 1995; Spender, 1996; Boisot, 1998; Lane & Lubatkin, 1998; Matusik & Hill, 1998; Crossan, Lane, & White, 1999; Inkpen, 2000; Dyer & Hatch, 2006; Inkpen & Pien, 2006) consider organizational cognition or organizations as cognitive entities a suitable unit of analysis. In the organization science literature, organizational learning is a central tenet (Huber, 1991; Simon, 1991; Argyris & Schön, 1996; Reagans & McEvily, 2003; Hansen, Mors, & Lovas, 2005) and is believed to lead to competitive advantage (Senge, 1990; Moingeon & Edmondson, 1996; Hansen & Nohria, 2004; Dyer & Hatch, 2006; Lavie, 2006). It is closely intertwined with inter-organizational learning (e.g. Larsson, Bengtsson, Henriksson, & Sparks, 1998, 1998; Greve, 2005) as the learning entities in both concepts positively affect each other (Doz & Hamel, 1998; Child, 2001; Holmquist, 2003).

Knowledge Networks are commonly defined as formally set up mechanisms, structures, and behavioral patterns that connect knowledge agents who were not previously connected because of functional, hierarchical, or legal boundaries between organizations. Inter-organizational knowledge networks (e.g. Mowery, Oxley, & Silverman, 1996; Klein, 1996; Inkpen & Tsang, 2005; Dyer & Hatch, 2006; Inkpen & Pien, 2006) provide the setting for Knowledge Management under Coopetition.

Theoretical Underpinnings of Knowledge Management under Coopetition

The 'resource based view of the firm', along with its conceptual predecessor, the 'industrial organization view', and its extension, the 'knowledge based view of the firm', have shed light on the

question why firms cooperate to learn from one another, share capabilities and knowledge, while - at the same time - manage knowledge as a valuable resource in the competitive environment.

Until the 1980s, competitive thinking - reflected in the 'industrial organization view' - has generally been seen focusing on companies' environments (e.g. Porter, 1980; Spender, 1996; Teece, Pisano, & Shuen, 1997). As such, it stands for an outward focus. Since the mid 1980s, the so-called 'resource-based approach' (Wernerfelt, 1984; Rumelt, 1987; Prahalad & Hamel, 1990) has partially built on Penrose's conception of the firm as a "collection of productive resources, both human and material" (Penrose, 1959, p. 31). The resource-based approach builds on two basic assumptions: (a) the firm's ultimate objective is to achieve sustained, above normal returns, and (b) a set of resources and their combination transformed into competencies and capabilities are a precondition for sustained superior returns (Rugman & Verbeke, 2002; Lavie, 2006). These resources are to be firm-specific (i.e. imperfectly mobile), valuable to customers, non-substitutable, difficult to imitate, and differently available to firms. Companies are seen as heterogeneous with respect to their resource and capability endowments (Teece et al., 1997). Assets such as knowledge are not readily tradable; they cannot equilibrate through factor input markets. Hence, critical resources can typically not be acquired via the market and consequently need to be developed internally. Competitive advantage is associated primarily with heterogeneous resource endowments of firms (Wernerfelt, 1984; Prahalad & Hamel, 1990; Hamel, 1991; Barney, 1991; Felin & Hesterley, 2007; Newbert, 2007).

Recent extensions of the knowledge-based perspective (Grant 1996) are centered around its application to a 'network of firms', rather than an individual firm (Hamel, 1991; Prahalad & Ramaswamy, 2000; Dyer & Nobeoka, 2000; Gulati, Nohria, & Zaheer, 2000; Doz, Santos, & Williamson, 2001; Grant & Baden-Fuller, 2004; Smith, Collins, & Clark, 2005). As developed in the 'relational view of the firm', firms ought to look at inter-organizational networks as a source of sustainable competitive advantage (Liebeskind, Olivier, Zucker, & Brewer, 1996; Powell, Kogut, & Smith-Doerr, 1996; Powell, 1998; Dyer & Singh, 1998; Dyer & Hatch, 2006).

Different scholars hold different views on what criteria need to be applied to differentiate critical from non-critical resources. Barney (1991) proposes 'value creation for the company', 'rarity compared to competition', 'imitability', and 'substitutability'. Prahalad and Hamel (1990) distinguish 'core competencies' from 'non-core competencies' by outlining core competencies as being suitable for application in many different markets, creating a significant contribution to customer value, and being difficult for competitors to imitate.

To specify resources that accommodate these criteria is equally controversial (Priem & Butler, 2001a & b; Rugman & Verbeke, 2002). The literature offers a plethora of phrases such as 'firm resources' (Barney, 1991, 2001), 'invisible assets' (Itami, 1987), 'dynamic capabilities' (Teece et al., 1997), 'knowledge creation capabilities' (Smith, Collins, & Clark, 2005), or 'relation-specific capabilities' (Dyer & Hatch, 2006).

Roos and Roos (1996) or Drucker (1993) proclaim that knowledge, whether referred to as invisible assets (Itami, 1987), absorptive capacity (Cohen & Levinthal, 1990; Lenox & King, 2004; Lane, Koka, & Pathak, 2006), core competencies (Prahalad &, Hamel, 1990), core capabilities (Kogut & Zander, 1996; Tushman & Anderson, 2004), or organizational knowledge (Nonaka &, Takeuchi, 1995; Argyris, 2004), can be seen as the only - or at least an important resource - that fulfils the foregoing criteria. Teece (1998) even argues that the essence of a firm is its ability to create, transfer, assemble, integrate, and exploit knowledge assets.

These lines of thought match the traditional analysis that both Ricardian and monopoly rent

theorists derive in large part from intangible assets with organizational learning and knowledge being among the most crucial ones (Penrose, 1959; Liebeskind, 1996; McGaughey, 2002; Kaplan & Norton, 2004). By stressing the outstanding importance of knowledge, they have given birth to the 'knowledge-based perspective' as a special form of the resource-based one.

Coopetitive Learning and Knowledge Exchange Networks (CoLKENs) as the Setting for Knowledge Management under Coopetition

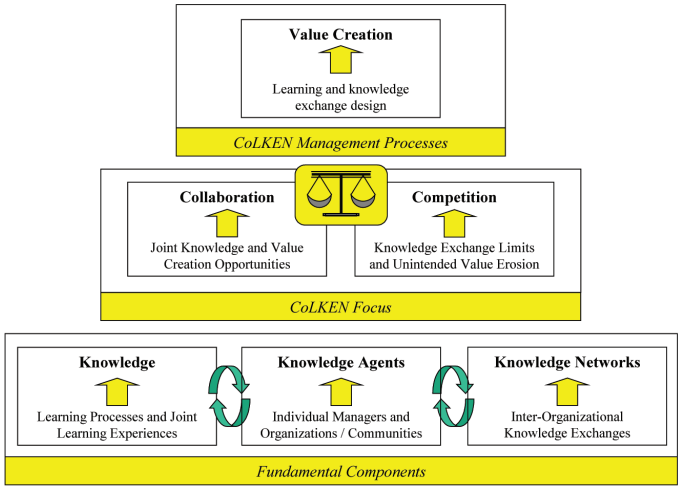
As outlined above, knowledge management has been increasingly considered as a key managerial function necessary for achieving competitive advantage (Tsang, 2002; Chakravathy, McEvily, Doz, & Rau, 2003; Sambamurthy & Subramani, 2005). Economic thinking leaves no doubt that scarcity is a precondition for property and thus commercial value of any resource. Consequently, it puts a question mark on generously sharing knowledge in an economic context. Thus, inter-organizational knowledge sharing processes revolve around a formidable balancing act between borrowing knowledge assets from partners, while protecting one's own assets (Loebbecke, van Fenema, & Powell, 1999; Levy, Loebbecke, & Powell, 2003). The challenge is to share enough skills to learn and create advantage vis-à-vis companies outside the network, while preventing an unwanted transfer of core competencies to a partner (Hamel, Doz, & Prahalad, 1989). This challenge is exacerbated when some members in the network are competitors. In such constellations, the danger of becoming 'hollowed out' by 'predatory' partners (Hamel et al., 1989; Kogut & Zander, 1996) seems particularly evident, suggesting that appropriate steps be taken to ensure mutually beneficial sharing. Nevertheless, many of the skills that migrate between companies are not covered in the formal terms of a knowledge exchange (Loebbecke & van Fenema, 2000). Often, what gets traded - i.e. what is learned - is determined by day-to-day interactions between engineers, marketers, and product developers (Hamel et al., 1989).

CoLKEN Fundamental Statements and Components

Following the above insights, a 'CoLKEN Construct' (see Figure 1) is built based on seven fundamental statements (see also Loebbecke & Angehrn, 2003a):

1. Knowledge assets have their foundation not only in data and in information, but also in collaborative learning processes.
2. Both the individual employee as well as the organization should be seen as knowledge agents capable of owning and processing knowledge.
3. Knowledge agents exchange knowledge in knowledge networks within and - in the light of ubiquitous information, communication, and media technologies - increasingly between organizations.
4. The increasing appearance of inter-organizational networks triggers a focus on learning and knowledge exchange processes between organizations during coopetition.
5. Cooperation forms the basis for any knowledge exchange process between organizations as it supports the learning processes through which knowledge is created and acquired as well as shared and disseminated.
6. In the light of competition, knowledge serves as a critical resource or asset to achieve competitive advantage and above normal rents.
7. Management processes and actively managed strategic interventions (stimuli) in knowledge exchanges allow organizations to create value by significantly impacting the composition, the exploitation and exploitability, as well as the business results of

Figure 1. CoLKEN construct



learning, knowledge, and intellectual assets at large.

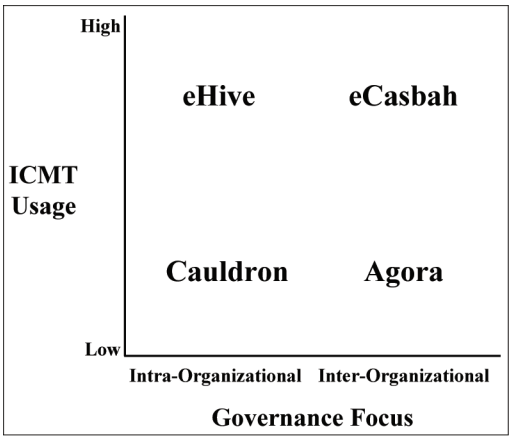
The three fundamental components, 'Knowledge', 'Knowledge Agents', and 'Knowledge Networks' (Statements '1', '2', and '3') lay the foundations for investigating inter-organizational learning and knowledge exchange networks in the context of coopetition (see also section on 'Background'). The CoLKEN focus is represented as a central platform on which cooperation and competition are performed (Statements '4', '5', and '6'). In order to create and extract the maximum economic value, the challenge is to balance both aspects by designing and implementing management processes for active strategic interventions in the CoLKEN (Statement '7').

CoLKEN Taxonomy

Possible dimensions for differentiating CoLKENs are 'information, communication and media technology (ICMT) usage', 'governance focus', 'size', 'growth pattern', 'composition', 'degree of internal competition'. Selecting the first two dimensions, Figure 2 shows a CoLKEN taxonomy (adapted from Loebbecke & Angehrn, 2003b).

A cauldron, the large kettle or boiler used by witches mixing and cooking ingredients without a clear pattern, stands for intra-organizational and low-technology CoLKENs. An agora, the ancient Greek marketplace, represents inter-organizational, low-tech solutions. An eHive takes the concept of a hive, a container for housing honeybees, to the virtual level. It describes a busy intra-organizational environment without clear pre-arranged patterns of action or movements. An eCasbah, finally, transfers the concept of the older, native section of a north-African city with

Figure 2. CoLKEN taxonomy



its busy market places to the 'e'world, where it represents inter-organizational settings with learning and knowledge exchanges taking place solely via ICMT infrastructures.

While the basic assumption of coopetition between organizational units requires some degree of 'inter'-organizational networking, the horizontal axis takes into account the more or less overriding legal structures that may emphasize the 'intra'-setting for competing sub-units.

Research Drivers and Key Insights

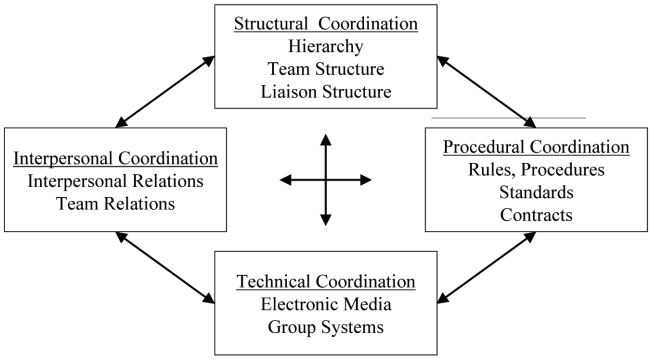
Research concerning organizational and social aspects of CoLKENs as the setting for Knowledge Management under Coopetition investigates initiatives ranging from local industry clusters to new forms for organizations with globally distributed knowledge workers operating within Open Source communities. Dominating research drivers are (1) the motivation for individuals and for companies to participate in the networks (e.g. Argote, McEvily & Reagans, 2003), (2) issues of leadership, coordination and control strategies, and decision making, (3) the management of collaboration including knowledge creation, sharing and management as well as learning and innovation (e.g. Menon & Pfeffer, 2003), and finally, (4) the management of the competition dimension. These issues ought to be analyzed along the trajectories of 'who' (people), 'what' (topics), and 'how' (processes). Further, various contingencies for inter-organizational knowledge governance based on dominant knowledge types, the assessment of the ease of knowledge sharing and retention, and the direction of knowledge flows (unilateral or bi-directional/reciprocal) play an important role for investigating Knowledge Management under Coopetition.

Main research insights derived from the above lines of analyses can be summarized as follows:

- Individual managers are mostly motivated by opportunities to engage in new forms of collaborative learning and management development. Organizations aim to achieve their objectives through acquisition of knowledge critical to their processes or strategy.
- The dominant form of collaboration and learning is traditional knowledge transfer, i.e. contexts in which members do not need to engage too personally or do not need to contribute their knowledge at all. More experiential forms are rare; they emerge primarily in non-critical domains and after having succeeded in helping members to develop more stable relationships and trust (for the impact of different kinds of interventions see also Cabrera, 2002).
- The competition dimension limits knowledge exchange to pre-defined domains and formats which are perceived by members as non-competitive in terms of not releasing much critical knowledge to potential competitors.
- By better aligning the motivation of their members and 'selecting' them accordingly, CoLKENs could reduce the negative influence of the competition dimension. On the other hand, ambitious growth strategies lead some CoLKENs to operate less selectively when it comes to assessing and aligning the motivation of their members.
- Appropriate coordination and control mechanisms are crucial for success; structural and interpersonal mechanisms outweigh procedural or technical mechanisms (see Figure 3).

Additionally, for instance Loebbecke and Angehrn (2003a, 2004), Teigland and Wasko (2003), and Loebbecke and Angehrn (2004), offer contingency dependent results for various settings of Knowledge Management under Coopetition.

Figure 3. coordination and control mechanisms for knowledge management under coopetition



Levers for Managing CoLKENs

With a significant number of inter-organizational networks failing in some sense (Inkpen & Beamish, 1997; Lam, 1997), there is an established body of literature investigating factors causing such failures together with steps for improvement (Cohen & Levinthal, 1990; Hamel, 1991; Mowery et al., 1996; Powell et al., 1996; Inkpen & Beamish, 1997; Lam, 1997; Dyer & Singh, 1998; Kumar & Nti, 1998; Larsson et al., 1998; Powell, 1998). Possible management levers for dealing with the paradox of simultaneous cooperation and competition have emerged from this literature. The main factors for discussion are (1) factors influencing the extent of learning and knowledge sharing, (2) factors influencing the stability of the relationship, and (3) factors influencing the ability of CoLKEN partners to collaborate.

As factors influencing the extent of learning and knowledge sharing, Kogut (1988) and Mowery et al. (1996) name alliance contracts and governance structures. For instance, equity joint ventures lead to a higher degree of knowledge sharing than contract-based alliances. Cohen and Levinthal (1990), Dyer and Singh (1998), Kumar and Nti (1998), and Larsson et al. (1998) point to partners' internal capabilities. According to Hamel (1991), Kumar and Nti (1998), or Larsson et al. (1998), the amount of learning taking place in the relationship depends on each partner's collaborative strategy.

As the main factor influencing the stability of the relationship, Pfeffer and Salancik (1978) relate to bargaining power. If collaboration provides access to other partners' resources (e.g. knowledge and skills), dependencies caused by resource specificity may change or disappear and the alliance may be terminated (Inkpen & Beamish, 1997). Hence partners who want to ensure alliance stability should prevent outsiders from learning 'all there is to learn', create new knowledge, and consider the track record of their partners.

Finally, factors influencing the ability of network partners to collaborate are discussed. For Dyer and Singh (1998) appropriate management processes and governance structures are crucial for turning membership into a source of competitive advantage. They even suggest protection against (a) opportunistic behavior in the network, (b) high volume of information exchange, (c) knowledge sharing routines, and also suggest the development of self-enforcing safeguards (trust and incentives) for sharing. The ability to have influence on the network structure and to occupy an information rich position shall provide network members with promising entrepreneurial opportunities (Powell et al., 1996).

FUTURE TRENDS

Further research is needed to compare 'traditional' settings for Knowledge Management under Coopetition, where there is less ICMT usage, with more virtual ones. Additional insights are to be sought as to the actual and potential impact of innovative technologies with regard to managing CoLKENs. One should investigate and assess (a) the real potential of ICMT for the majority of today's CoLKENs, (b) the ICMT-related challenges the organizations in question are likely to face, as well as (c) the new mindsets and competencies members and managers of such networks will require for taking full advantage of distributed approaches to learning and knowledge management.

CONCLUSION

The fact that motivations and incentives for participation vary, makes Knowledge Management under Coopetition particularly complex. Here CoLKENs as settings for Knowledge Management under Coopetition represent opportunities for individual managers to engage in new forms of knowledge management under coopetition: They provide organizations with opportunities to better achieve their objectives through acquisition of knowledge critical to their processes and strategy or through collaborative knowledge exchanges and initiatives.

Nevertheless, competitive logic can prevent individuals as well as organizations from taking advantage of constructive Knowledge Management under Coopetition. The competition dimension influences the design of value-creation processes such as 'collaborative learning', 'knowledge exchange', and 'derived initiatives'.

To conclude, innovative forms and settings of Knowledge Management under Coopetition enable contributors to benefit from their participation in such inter-organizational knowledge management initiatives, whereby members may decisively improve learning efficiency and cooperative acting while taking into account competitive positions. To exploit the opportunities derived from Knowledge Management under Coopetition to the fullest, appropriate coordination and control mechanisms as well as a deliberate strategic approach towards Knowledge Management under Coopetition are indispensable.

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KEY TERMS AND DEFINITIONS

CoLKEN: Coopetitive Learning and Knowledge Exchange Network, i.e. a specific setting for inter-organizational knowledge management initiatives focusing on issues related to cooperation-competition-dilemmas and intentional / unintentional knowledge transfer.

CoLKEN Construct: Structure of main CoLKEN components: At the base level are 'knowledge', 'knowledge agents', 'knowledge networks', at the CoLKEN focus level we find the balancing act between cooperation and competition, which should lead to value maximization on the top level.

CoLKEN Taxonomy: Depicting groups of CoLKENs by differentiating the overall variety along at least two dimensions: For practical and research purposes, the taxonomy shown in this article differentiates along the dimensions 'ICMT usage' and 'governance focus'.

Coopetition: Simultaneous existence and relevance of cooperation and competition.

Knowledge Agents: Individuals or organizations storing, retrieving, transferring, and applying / exploiting knowledge resources.

Knowledge-Based Perspective: Special form of resource-based perspective stressing the significance of knowledge as a scarce resource and organizational differentiator.

Knowledge Networks: Formally set up mechanisms, structures, and behavioral patterns that connect knowledge agents who were not previously connected because of functional, hierarchical, or legal boundaries between organizations.