

Conclusion and Discussion

5.1 Introduction

This dissertation aimed to investigate the role of management, leaders and core members in coordinating intra-organizational NOPs. Coordinating intra-organizational NOPs offers the unique challenge of having to connect community-based coordination principles within a hierarchical context while supporting knowledge sharing for organizational learning. I conducted three empirical studies, each from a different perspective: that of management, leaders and core members. Chapter two took a managerial perspective and investigated how NOPs can be managed without being ‘killed’, by unraveling the knowledge management dilemma that is associated with managing NOPs. This study specifically focused on knowledge sharing because that forms the basis of organizational learning processes. Chapter three addressed how NOP leaders deal with the learning tension that is inherent to using NOPs to support organizational learning. The last empirical study, reported in chapter four, focused on who the core members of NOPs are and what they do to support organizational learning through NOPs. Together, the findings from these three studies indicate that coordinating NOPs involves three main dynamics that managers, NOP leaders, or core members can support (or hinder): (1) embeddedness in practice to ensure bottom-up knowledge sharing and individual and group level learning; (2) social embeddedness (social connections, strong ties, shared understanding) among network members to ensure knowledge sharing and knowledge integration at the network level; and (3) organizational embeddedness to ensure knowledge sharing and organization level learning. The main challenge of coordinating intra-organizational NOPs is interconnecting the often conflicting practice-related interests of the network members, with the organizational level interests to institutionalize learning outcomes in the organization. Moreover, the member-level and organizational-level interests are, to some degree interdependent: network members need organizational support to connect and exchange, and the organization needs bottom-up knowledge sharing to learn. In order for NOPs to support knowledge sharing to enhance individual, group and organizational level learning, these interdependencies need to be managed.

In this chapter, the main findings of the three empirical studies will first be presented followed by implications for theory, limitations of the studies and suggestions for further research will be discussed.

5.2 Main Research Findings

Before discussing the implications of this dissertation the findings of each study will be summarized.

5.2.1 Main research findings study one

The first empirical study investigated coordinating NOPs from a managerial point of view. Central to this perspective is the idea that a management dilemma exists between controlling NOPs to achieve knowledge integration and providing them sufficient space to self-organize and emerge so knowledge sharing takes place. One of this study's key findings then was that this dilemma can be disentangled into four interrelated forms of embeddedness in which management can intervene. The first two types of embeddedness relate to the *content* exchanged within the network and involve embeddedness in practice and organizational embeddedness. The last two types of embeddedness relate to the *connections* within the networks and involve structural and relational embeddedness. These four types of embeddedness have a dynamic relationship with knowledge sharing, a central process within NOPs and the stepping stone for organizational learning. For example, the developed model (see figure 2.1, p. 55) assumes that the more embedded the networks' exchanges are in the practices of their members, the more likely members are to share knowledge. This study's findings further demonstrate the effects of various management interventions on the different forms of embeddedness and knowledge sharing. Management interventions may have a stimulating or a deteriorating effect on how each embeddedness 'wheel' turns and, consequently, on knowledge sharing. In addition, these four types of embeddedness are interrelated. For instance, when management excessively intervened in organizational embeddedness, for instance, by setting the agenda for interaction, the perceived relevance of that content in the local practices was negatively affected, thereby slowing down the knowledge sharing wheel. Thus, in terms of content, managers have to stimulate the creation and sharing of content that is relevant to the larger organization, without losing the relevance for network members' local daily practices. The main managerial challenge of coordinating intra-organizational NOPs is thus to balance these multiple requirements. Although the model presented in chapter two primarily provides a means to clarify and analyze the management

dilemma, it also improves our understanding of how to cope with this dilemma in practice. Practical implications will be discussed in paragraph 5.4.

5.2.2 Main research findings study two

The second study investigated how NOP leaders coordinate NOPs by studying how they cope with the learning tension that is inevitable when using NOPs instrumentally to support organizational learning. This study builds on the first study that showed how knowledge sharing is affected by social embeddedness as well as by both embeddedness in practice and organizational embeddedness. The four types of embeddedness influencing knowledge sharing, identified in the first study, each relate to one of the learning levels. These findings were expounded upon in the second study by disentangling the following three interrelated learning processes underlying organizational learning:

Interpreting: Connect individual-level to NOP-level learning by aligning network activities with local practices (thus relating to embeddedness in practice).

Integrating: Support NOP-level learning by establishing strong ties between network members to enable them to share insights and understanding (thus relating to structural and relational embeddedness).

Institutionalizing: Connect organizational-level to NOP-level learning by aligning network activities with organizational practices (thus relating to organizational embeddedness).

These three processes underlie organizational learning at the individual, NOP, and organizational levels of learning. But they also induce a learning tension for NOP leaders who must reconcile individual learning by NOP members according to shared practices, and ensure learning at the organizational level through the NOP by more managerial types of involvement. In studying how NOP leaders deal with this learning tension. We found that leaders enact two different strategies to coordinate NOPs: one is a brokering and buffering (B&B) strategy that balances individual, network, and organizational learning through their support of interpreting, integrating, and institutionalizing processes, and the other is a conducting and controlling (C&C) strategy that imposes organizational learning through institutionalization (and, to some extent, integration), without paying much attention to individual or network learning.

A B&B strategy entailed activities aimed at *brokering* interactions between the organization, the network, and members by establishing connections and translating between the different levels mediating among the network, its members, and the organization, while

also *buffering* between the levels by preventing negative effects of the different levels of learning on one another. These network leaders are thus able to successfully coordinate NOPs by acting as a *primus inter pares* within the network (i.e., recognize topics as a respected member with valued expertise and connections), while at the same time ensuring that routinized actions could occur by working closely with higher management to align network activities with organizational practices. Activities of leaders enacting a C&C strategy consisted of *conducting* the network activities by pushing members toward institutional practices, even though they lacked inside knowledge and expertise concerning the actual daily practices of members, and *controlling* the outcome of networks, without providing members the space to create strong ties or enable bottom-up discussions. Leaders applying C&C strategy for coordinating NOPs took a formal management position and prioritized hierarchical coordination over community-based coordination. The second study demonstrated that though a C&C strategy aims to achieve organization level learning through NOPs, the results are often counterproductive and these leaders seemed unable to alleviate the learning tension. Coordinating NOPs to support individual, group and organizational level learning thus requires a B&B strategy, where network leaders simultaneously emphasize interpreting, integrating, and institutionalizing.

5.2.3 Main research findings study three

While the first two studies were conducted in an organization with formal leadership roles assigned to their NOPs, the third case study was conducted at an organization whose NOPs were far more self-organized. Even though each network had about two moderators assigned to support the network, other network members were known to support the network as well; hence, coordination depended more on the voluntary activities of a group of core members. In the third study we therefore identified which members were considered most significant for the network (these members were labeled as core members), and investigated what these members do to coordinate their NOPs. In line with studies on core members of other groups (e.g. Wenger, McDermott, & Snyder, 2002) about 10% of NOP members are considered to constitute the core of the network because of their high level of expertise, their active participation, their efforts to support the functioning of the network, and/or because of their high formal position. Analyzing the content of all messages posted by core members showed that core members may perform nine different activities (in order of frequency): answer questions, provide unsolicited information, further discussions, ask questions, capture and evaluate contributions, broker between the network and the formal organization, broker to

other people or resources, moderate the network, and tell others what to do. An explorative factor analysis subsequently revealed that core members take up three different roles, each supporting a different learning process: an interpreting role, an integrating role and an institutionalizing role. Core members supporting the interpreting process feed their knowledge into the NOP, thereby predominantly supporting individual and network level learning. Core members supporting the process of integrating facilitate network level learning by integrating both the connections between the NOP members and the content they exchange on the network. Core members contributing to the process of institutionalizing (usually higher level managers) support organization level learning by creating knowledge flows between the network and the organization, and embedding network level learning in the organization. Core members thus collectively help their eNOPs contribute to organizational learning. As such, this third study showed that intra-organizational NOPs can also be successfully coordinated by a group of members who voluntarily choose to support one (or more) learning processes. Surprisingly, we observed much less tension between the interests of the members and those of the organization in this case study.

5.3 Theoretical Implications

The theoretical implications of each specific study are discussed in their respective chapters. In this section, more general implications from this dissertation will be discussed.

5.3.1 Coordinating NOPs

The findings of this dissertation imply that coordinating NOPs involves the support of social embeddedness, organizational embeddedness, and embeddedness in practice. Putting too much or too little emphasis on one of these types of embeddedness can lead to the unbalanced coordination of NOPs. Unbalanced coordination may cause NOPs to develop in two different directions, akin to the two related distributed knowledge sharing groups described in chapter 1: virtual teams and online professional communities.

In figure 1.1 of chapter 1, I juxtaposed intra-organizational NOPs, virtual teams, and online professional communities on two axes: the group's context and the group's main goal. The context axes ranged from community-based coordination principles to firm-based coordination principles, and the goal axis ranged from production-oriented knowledge sharing to learning-oriented knowledge sharing. This conceptualization showed that coordinating intra-organizational NOPs are unique because they must combine community-based and firm-

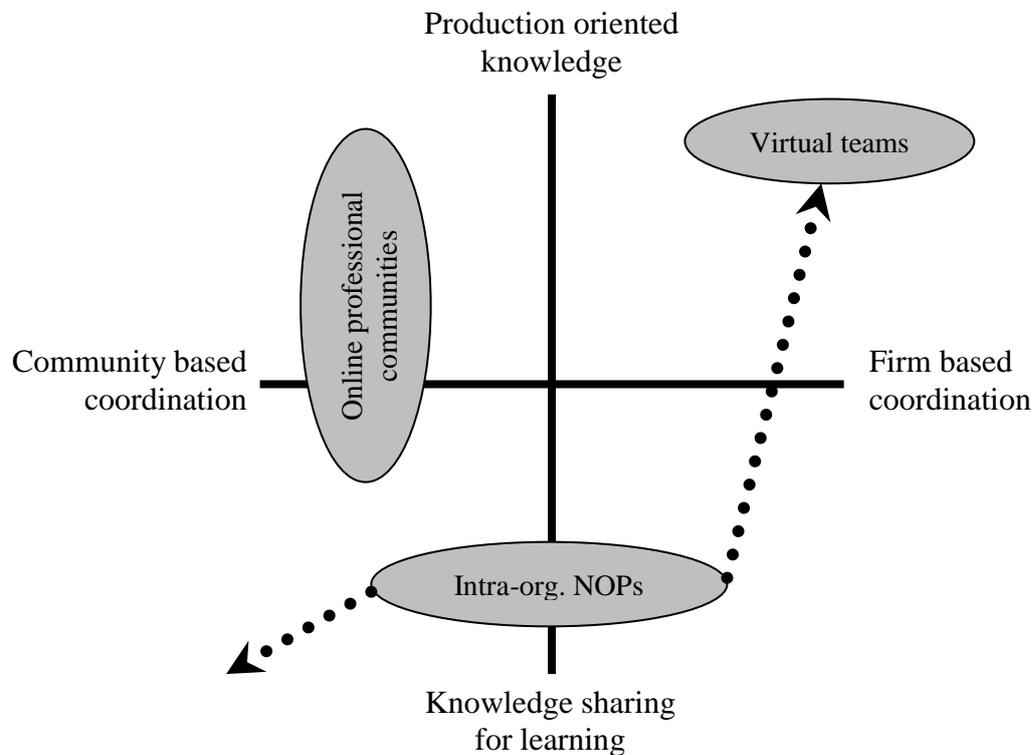
based coordination principles while sharing knowledge for learning purposes instead of production purposes (see figure 5.1).

The results indicate that if too much emphasis is put on organizational embeddedness, intra-organizational NOPs face the risk of becoming virtual teams (thereby moving towards the upper-right quadrant of figure 5.1). While virtual teams can be very effective means for integrating dispersed expertise, their underlying dynamics are different from NOPs. Being a member of a virtual team is part of one's formal job for which one is remunerated and held accountable. As we have seen in the first two studies, when NOPs shift towards becoming more like virtual teams, network members withdraw because the intrinsic motivations to participate, such as shared interests, the opportunity to learn, helping others, or joint enterprise (Faraj & Wasko, 2005; Wasko & Faraj, 2000) are overruled. Instead of being a place to meet, interact and learn from peers, participating in NOPs becomes a burdensome addition on top of one's daily work. As a result, bottom-up knowledge sharing and learning around local practices tends to come to a halt. This likely means that tasks go undone as people are likely to withdraw. Such NOPs are thus ineffectual both as a knowledge network and a virtual team.

On the other hand, if managerial involvement is too scarce, intra-organizational NOPs face the risk of becoming online professional communities (thereby resting in the lower-left quadrant of figure 5.1). In this case, members will continue to share knowledge and learn from each other, however no organizational-level actions will result. Moreover, knowledge sharing networks that are disconnected from the formal organization may become irrelevant to the organization if there is no alignment to the organizations' aims and goals. We observed this in the gender network of TDO. This NOP arose from employees who claimed that gender issues should be on the agenda of the organization. The group had little success and its activities were often seen as irrelevant or as merely "social chit-chat" with little value in terms of organizational learning. Alternatively, if distributed knowledge sharing is not enabled (or perhaps even discouraged) by the organization or it is not desired by the network members, the network might dissolve into more localized communities of practice because there are no established connections between dispersed organizational members. In this situation, members will continue to interact within their own local communities, as we have seen in the forestry network described in chapter 2. Again, this is not inherently problematic – communities of practice are known to support knowledge sharing and learning (see e.g. Brown & Duguid, 1991; Wenger, 1998; Wenger & Snyder, 2000) – however, due to their invisibility and localized settings, these communities are likely to frustrate organizational level learning because knowledge created within the network will be invisible, hard to

recognize, or difficult to extract from the local context in which it was developed (Huysman, 2004). Hence, such COPs might have little value in terms of facilitating organizational learning and integrating dispersed expertise.

Figure 5.1. Consequences of unbalanced coordination of NOPs



If an organization manages to balance between embeddedness in practice, social embeddedness, and organizational embeddedness, both the NOP and the organization seem to *reinforce* each other: the organization facilitates the networks and supports their interactions; in turn the network propagates the organization by fostering organizational level learning, which enhances knowledge sharing and learning processes in the network. By combining the fields of network and firm research, this dissertation goes beyond research that either focuses on network dynamics or on formal management. This research therefore shows how the organization and the NOP can both strengthen one another. However this reinforcing relationship is not a given, but instead requires coordination between the different interests in the networks, i.e. the interests of the network and of the organization. It is precisely the coordination between these interests that proved to be a challenging endeavor, wherein management, leaders, as well as core members can play a critical role.

Differences in Divergence

Attaining and maintaining balanced coordination was more difficult in the NOPs at TDO than those at TCC. For instance, while the first two studies suggest that members who support the institutionalizing processes must struggle to balance on the thin line between too much or too little managerial involvement (Brown & Duguid, 2000), the third study indicates that core members supporting the institutionalizing process did not face such a management dilemma. Several explanations can be given for this discrepancy.

First, TDO was marked by a discrepancy between the organization's strategic aims and the realities of the everyday work. This conflict in interests might explain why work practices were different between the top management levels and those working in the field. While top managers were primarily strategizing to retain and generate funding from the government, the field workers were providing consultancy services to local clients to 'fight poverty'. As a result, leaders of TDO's networks did not always have the same practice as the network members. At the same time, however, their strategy plans at least partly depend upon input from the field. In contrast, management and lower level members in the TCC case study had similar backgrounds. They were all working to maintain their plants in an efficient and safe manner. In addition, only managers who had the expertise to contribute to the NOP were allowed to join TCC's networks. Contrastingly, knowledge in TDO was forced to move from network to organizational levels through formal management which consisted of individuals who did not share the same practice; this is an approach that undermines the notion that distributed knowledge sharing in NOPs relies on shared practices (Brown & Duguid, 2001; Vaast, 2004). In this light, divergent interests and practices between management and lower level employees may not only hinder knowledge sharing, but also impose the risk of NOPs becoming virtual teams. This research thus illustrates that it is not management involvement per se that complicates the coordination of NOPs but that complications may occur from diverging interests and practices that may arise from managerial level involvement.

A second difference between the two research settings is that the leaders in TDO were officially appointed and were even made responsible for the practice area. In contrast, the leadership in TCC was more informal and dependent on the voluntary activities of each single member. Assigning practice area managers as done by TDO might be advantageous if well aligned with NOP leaders (as in the B&B strategy), but there is considerable risks that formal leadership may hijack the network's interaction. This risk runs high because those held formally responsible for a NOP require concrete results, a pressure which might result in using NOPs as virtual teams. Leaders enacting a C&C strategy exemplify this. In contrast, the

NOPs of TCC were relatively self-organizing; some members assumed certain roles, and without formal coordination, different learning processes were supported which could have enhanced the successful balance in coordination. However, in both cases, NOPs supported knowledge sharing and organizational learning, making it hard to draw conclusions regarding optimal coordination roles in intra-organizational NOPs. The findings thus confirm that intra-organizational NOPs can be fairly self-organizing, but the likelihood of successful self-organization is increased in situations where there is little difference between higher level management and the people ‘in the field’.

5.3.2 Network Determinism

This dissertation also highlights a tendency, both in theory and practice, towards ‘*network determinism*’, similar to the “*technological determinism*” (see e.g. Leonardi & Barley, 2008; Orlikowski, 1996; Walsham, 1993) that characterized the first generation of knowledge management. In the first generation of knowledge management, when knowledge was conceptualized as an object, the idea that IT would solve most knowledge management issues thrived, because IT could store, transfer and retrieve knowledge (Huysman & de Wit, 2004; Scarbrough & Swan, 2001). In the second generation of knowledge management, attention shifted to the importance of social relations that arise from people participating in the same work practices for knowledge sharing and learning. In this view, knowledge is subjective, socially-embedded, and situated in actual practice and the context in which it was developed. Because practice-based learning was conceived as a social phenomenon that occurs independent of formal structures (Lave & Wenger, 1991), the role of management in practice-based learning was initially neglected. In later studies however (see e.g. Wenger & Snyder, 2000; Wenger et al., 2002), these ideas were appropriated in the context of knowledge management. Just like databases and other IT tools were seen as solutions to knowledge management issues in the first generation of knowledge management studies, the second generation tends to regard knowledge networks as a ‘holy grail’ for knowledge management. Management in the second generation was no longer ignored, but was usually framed in terms of sponsorship and “cultivating and care.” In practice we see that organizations increasingly implement NOPs with such a “if you build it, they will come” attitude (Brazelton & Gorry, 2003). Indeed, the NOPs studied in this dissertation resemble such an instrumental use of these ideas. However, migrating from technology as a determinant of knowledge sharing to the notion that social networks are an impetus for knowledge sharing, induces ‘*network*

determinism' – the idea that social networks can, like IT under technological determinism, themselves lead to successful learning and knowledge sharing.

The research presented in this dissertation suggests a more balanced view on 'network determinism' and 'cultivating and care' approaches. Providing the infrastructure and putting people together does not automatically mean that knowledge sharing will take place. Even if knowledge sharing occurs, it does not necessarily follow that organizational learning will happen. For organizational NOPs, this implies that "even if they come, organizational level learning will not automatically result." This finding opposes the often masked assumption that participating in a network must positively influence the value of the network. This assumption has some logical merit, but shares the same problem as *network determinism*: the assumption that participation in a network of practice, in itself, creates value. Indeed, this approach is an over-simplification, because the level of participation (in *quantitative* terms) may be far less important than the *quality* of this participation. In other words, quality, both in terms of relevance (of the knowledge being shared to the members' practice and to the organization's processes) and in terms of the relationships between members, may well be a more important determinant of network value than the number of hours spent in the network.

Three dynamics that may induce network determinism can be distinguished. The first two clearly follow from this dissertation, the third one is yet present in this dissertation and requires further research. A first tendency in knowledge management literature is to overemphasize the appealing notion of 'network' and 'community', while at the same time 'obscuring' the importance of practice as Brown and Duguid already warned against in 2001 (p. 203). From a theoretical stance, this is a somewhat surprising tendency taking into account that the idea of networks and communities of practice stem from practice theories: people develop a (sense of) community from their participation in joint practices (Orlikowski, 2002). Accordingly, social networks result from engaging in practice, even though some authors point out that shared practices develop after participating in a network (Van Baalen, Bloemhof-Ruwaard, & Van Heck, 2005). This dissertation shows that one key challenge in coordinating NOPs is to keep the NOP's activities relevant for the local practices of the members. However, both researchers and practitioners alike, face the risk of focusing too greatly on establishing connections between people while ignoring the practices that form the foundation of the connections within these networks. This neglect may negatively affect knowledge sharing and learning processes.

A second tendency in practice-based knowledge sharing theory is to obscure the role of management. While the role of management in knowledge management is often framed as

stewardship (Wenger, 1998), cultivation (Ward, 2000), nurturance (Alvesson, Karreman, & Swan, 2002), or fine tuning (Alvesson & Karreman, 2001), this dissertation shows that more active organizational involvement is needed to fully reap the benefits of intra-organizational NOPs. By illuminating the challenges of coordinating intra-organizational NOPs and providing more detailed insight in *how* management can coordinate these groups to stimulate knowledge sharing and organizational learning, the role of management becomes less obscured (Foss, Husted, & Michailova, 2010) and more influential for the outcomes of NOPs.

The social constructivist perspective on IT, knowledge, and organizing that is characteristic of the second generation of knowledge management might be a third root for network determinism. In studies taking a social constructivist stance, knowledge is seen as socially constructed through the interaction within a group. Likewise, social constructivist studies on IT focus on the ongoing stream of social action in which people interact with each other around technology and in doing so, construct the interpretation, use and even the technology itself, in the conduct of their everyday work (Leonardi & Barley, 2010). Technology is treated as neutral and, as opposed to technological determinism where technology is seen as the determinant of behavior, the influence it has on the social dynamics that emerge is downplayed (Leonardi & Barley, 2010). The underlying assumption of this stream of research thus states that the social dynamics within NOPs are the only determinant for learning outcomes, regardless of the fact that these social dynamics are largely supported by technology. This dissertation aligns with this social constructivist tradition, and hence reflects, at least partly, network determinism as well.

Just like the first generation of knowledge management, the second generation of knowledge management may yield disappointing results if it is characterized by network determinism. This dissertation thus urges scholars who study the role of social networks in organizational learning to disregard neither the practices that bind people together, nor the agency of management. In addition, the role of technology within these dynamics should be taken into account in order to gain a better understanding in how intra-organizational NOPs support organizational learning. As will be discussed in paragraph 5.6, future research on distributed knowledge processes could move away from both network determinism and technological determinism by taking a sociomaterial approach (Orlikowski, 2007) which enables us to bring the role of technology back to our analysis without losing sight of social dynamics.

Technology might have played a role in the coordination of NOPs in several ways. For instance, the public exposure inherent to posting on online networks might have induced

strategic behavior. Members could have shared their expertise because they want to present themselves as competent (Ma & Agarwal, 2007) or to gain social influence in the network (Kleinnijenhuis, van den Hooff, Utz, Vermeulen, & Huysman, 2010). By supporting the three learning processes they could have (whether intentionally or not) increased their visibility to management and as a result, enhanced their career opportunities (Hayes & Walsham, 2001) or gained more influence in organizational decision making (Treem & Leonardi, 2012.; Zammuto, Griffith, Majchrzak, Dougherty, & Faraj, 2007). This might even be an underlying rationale for members to support the interpreting, integration or institutionalizing process. As such the open structure of the supporting technologies could have enabled members to take up certain coordination roles within their network of peers, which they otherwise might not have done. Changing the technology by, for instance, creating closed groups or meeting in small face-to-face groups, might then –intentionally or not – change this behavior. Similarly, because online forums leave all communication visible, active participants discussing somewhat dissimilar interests may dominate the network’s interaction and thereby make the NOP seem less embedded in the practices of the other members. This may discourage minority voices from contributing (Faraj, Jarvenpaa, & Majchrzak, 2011). The active participation by some of TDO’s managers who wanted input for their strategy plans might have given the impression that these networks were not a place to discuss local issues. Simple technical features, like a folder structure in the online forum to discuss these particular topics could help in coordinating such different interests. This implies that the literature on the coordination of NOPs could benefit from studies that take both the social dynamics and the material aspects of technology into account (Leonardi & Barley, 2008, 2010; Orlikowski, 2007; Zammuto et al., 2007).

5.3.3 NOPs as link between individual and organizational level learning

The studies reported in this dissertation are among the first to provide some empirical evidence for how NOPs connect individual to organizational level learning. The relationship between individual learning and organization level learning is a challenging issue frequently discussed in organizational learning literature (Antonacopoulou, 2006; Bontis, Crossan, & Hulland, 2002; Kim, 1993; Romme & Dillen, 1997). March and Olsen (1975) for example portrayed organizational learning as a cyclic process of adapting to experiences which progress from the environment, to the individual, to the organization, and back to the environment again. The authors describe several ways in which this cycle can be broken; of these disruptions, disconnects between individual action and organizational action is of

particular relevance to this dissertation. March and Olsen refer to such situations as ‘audience learning’, implying that what is learned at the individual level is not adopted by or integrated in the organization. This also occurred in the NOPs studied in this dissertation.

However, this dissertation conceptualizes organizational learning as a continuous and social process where informal (as opposed to formal) learning is emphasized (Antonacopoulou, 2006; Easterby-Smith, 1997). Within such a social constructivist view on learning (Gherardi, 2000, 2001), social networks, like NOPs, are increasingly suggested as a means to connect the individual to the organizational learning level (Bogenrieder & Nooteboom, 2004; Brown & Duguid, 1991; Hannah & Lester, 2009). Nevertheless the findings of this dissertation imply that NOPs do not necessarily ensure that individual (and network) level learning is integrated into the organization. Rather, this dissertation shows that what is learned at individual and network levels might not be integrated in the organization and hence knowledge may ‘stick’ at the network level, leading to situations akin to ‘audience learning’.

Moreover, this dissertation shows that the risk of audience learning is higher because of possible conflicts of interest between the practice-based interests of the members and the organizational level interests to institutionalize learning outcomes in the organization. Such conflicts are given little attention in research that conceptualizes organizational learning as a social process (Easterby-Smith, 1997). This dissertation contributes to this field by illuminating the necessity to coordinate such conflicts of interest in order to connect different learning levels, and further, by unraveling the challenges of coordinating these NOPs.

More specifically, while involvement of higher management is usually considered counterproductive for informal and practice based knowledge sharing to occur (Hayes & Walsham, 2001; Thompson, 2005), the findings of this dissertation imply that this involvement is essential for organizational level learning to occur. As mentioned in previous studies on organizational learning (e.g. Bontis, Crossan, & Hlland, 2002; Lawrence et al., 2005), organizational level learning does not simply result from the knowledge exchanged in NOPs, but rather ‘depends on interested actors who work to embed them in routines, structures and cultures of the organization’ (Lawrence et al., 2005, p. 182), usually higher level managers.

Additionally, the results of this study indicate that learning from individual and network levels does not only advance to organizational levels. Management, as representative of the organization, can improve the connection between network and individual activities and organizational activities with feedback processes (Crossan, Lane, & White, 1999). The

connection between network level and individual level activities, and organizational activities can be enhanced by communicating about organization level issues, providing a frame of reference, or conveying a coherent vision on the organization (Anand, Gardner, & Morris, 2007; Berson, Nemanich, Waldman, Galvin, & Keller, 2006). This suggests that the learning cycle as described by March and Olsen (1975) is not unidirectional, because organizational actions also directly influence individual actions, as emphasized by Antonacopoulou (2006). If these processes are coordinated in a balanced manner, intra-organizational NOPs support not only distributed knowledge sharing for individual and group learning, but they also help to integrate that knowledge on an organizational level.

5.3.4 The knowledge -based view of the firm

According to the knowledge-based view of the firm, a key challenge for an organization's survival is the integration of the knowledge that is embedded in the expertise of dispersed employees (Boh, Ren, Kiesler, & Bussjaeger, 2007; Grant, 1996a, 1996b). The studies presented in this dissertation combine knowledge management literature with theories on knowing in practice. While the former tends to regard knowledge as something that can be stored, transferred, and managed, the latter regards knowledge and learning as inextricably linked to participating in shared activity, with little agency assigned to leadership or management in shaping these knowledge processes (Fox, 2000). This dissertation adheres to this practice-based view of knowing but at the same time acknowledges the agency of leadership and management by studying their role in coordinating intra-organizational NOPs. In so doing, the findings of this dissertation indicate that intra-organizational NOPs enable knowledge sharing over distance, without extracting it from practice. This research has several implications for studies related to the knowledge-based view of the firm.

Crossing boundaries

First, collaborating across boundaries remains an important concern for this stream of literature. This research points to the important role of key actors in bridging and brokering between geographical, organizational, hierarchical, and occupational boundaries; this is akin to the role which boundary spanners have in overcoming differences identified in cross-boundary collaboration research (e.g. Levina & Vaast, 2005, 2008; Tushman & Scanlan, 1981). NOP members span spatial and organizational boundaries because NOPs become a meeting place for experts from different organizational divisions and locations (Tallman &

Chacar, 2010). NOP members also cross hierarchical boundaries as they come from different hierarchical levels, ranging from low level employees to top management. Even though NOP members share the same practices, as also reported in chapters two and three, local occupational differences remain prone to complicate cross-boundary knowledge sharing. Hence the strong boundaries that might arise from disparate practices need to also be spanned (Bechky, 2003; Cramton, 2001). Three specific implications for the role of these key actors can be defined.

On such implication is that these key actors can be managers, NOP leaders or core members. The source of these actors' authority plays an important role in helping to span boundaries. First and foremost, to help overcome boundaries that arise from local differences in practices, leaders need authority that is based on their expertise in the practices that bind NOP members together (e.g. Alvesson & Sveningsson, 2003; Reed, 1996). Second, leaders need authority that is based on social position (Balkundi & Harrison, 2006; Mehra, Dixon, Brass, & Robertson, 2006) to broker interactions between dispersed members (Balkundi & Kilduff, 2005) and to extend social capital, build coalitions, and act as mentor and brokers (Ammeter, Douglas, Gardner, Hochwarter, & Ferris, 2002; Balkundi & Kilduff, 2005; Plaskoff, 2003). Third, leaders need formal authority in the formal organization to broker between hierarchical boundaries; this is important to institutionalize network level learning into the organization's routines, procedures or culture. These three sources of authority are needed to leverage differences in interests that may arise from collaboration across hierarchical, practice, social and geographical boundaries.

Thirdly, this dissertation confirms the significance of a practice perspective (Gherardi, 2000; Nicolini, 2011; Orlikowski, 2000) in understanding knowledge processes in organizations. Levina and Vaast (2005) described the importance of boundary spanners-in-practice, as compared to appointed boundary spanners, for successful collaboration across boundaries. Boundary spanners can be appointed, just like to the NOP leaders of study two, but as the C&C leaders illustrate so vividly, these people are not necessarily actually spanning boundaries-in-practice. On the other hand, people can act as boundary spanners-in-practice without being formally appointed to do so. The core members of the third study exemplify these non-appointed boundary spanners-in-practice as they voluntarily decided to behave accordingly. This corroborates the notion that formal structures may not necessarily reflect actual practices (Brown & Duguid, 1991; Wenger, 1998). Rather, this idea evokes the need to examine the actual practices of informal and formal leaders, and management (Denis,

Langley, & Rouleau, 2010), of which the third case study is a good example. In addition, this finding hints at how emergent organizing can take place within a hierarchical context.

The role of management and leadership

In the knowledge-based view of the firm, the role of management or leadership is typically described as integrating, directing, and coordinating knowledge from a highly centralized point of view (Boh et al., 2007; Bryant, 2003; Grant, 1996a, 1996b; Kogut & Zander, 1992). Alternatively, this dissertation suggests a more participative role where formal authority is not only employed to provide resources and political sponsorship to support interaction and develop knowledge, but also to detect emerging opportunities, to legitimize that emergent knowledge with respect to existing organizational visions, aims and strategies and to align individual interests with organizational interests, (Anand, Gardner, & Morris, 2007; Hannah & Lester, 2009). More specifically I herewith demonstrated how leadership and management are an integral part of knowledge processes, instead of merely being a factor that influences the outcome of these processes (von Krogh, Nonaka, & Rechsteiner, 2011).

Such a participative rather than directive managerial role further implies that hierarchical boundaries are becoming more fluid. This dissertation therefore also contributes to the budding field of emergent organizing. Whereas online communities are already frequently described as emergent and self-organizing (Desanctis, Fayard, Roach, & Jiang, 2003; Faraj, Jarvenpaa, & Majchrzak, 2011; O'Mahony & Ferraro, 2007; Wasko & Faraj, 2005), emergent organizing is gaining more interests within hierarchical contexts as well (Zammuto, Griffith, Majchrzak, Dougherty, & Faraj, 2007). The third case study provides an example of how members of an organizational group volunteer on an ad-hoc basis to take on a certain role, not because they are formally expected to, but because they perceive a need to do so. While assuming this role, they collectively support the contribution of NOPs to organizational learning. As such, this study also hints at how leadership roles can be distributed among several group members (Gronn, 2002; von Krogh et al., 2011), an idea which is gaining more prominence in settings that are virtual (Pearce, Yoo, & Alavi, 2003) voluntary (Pearce, Perry, & Sims, 2001) and knowledge intensive (Pearce 2004).

Exploration and exploitation

A final contribution of this dissertation is that it provides more insight into the classic issue in organization studies of how to reconcile the exploration-exploitation tension between creating new knowledge and exploiting existing knowledge (Crossan, Lane, & White, 1999; Fang,

Lee, & Schilling, 2010; March, 1991). A simulation study by Kane and Alavi (2007) suggested that NOPs only support exploration. The proposed logic behind this was that knowledge created within NOPs does not move beyond the level of the NOP and hence has little effect on exploitation in the organization. However, I have found that NOPs can also support exploitation. Such an incongruent finding can be interpreted as a confirmation that the involvement of higher level management in knowledge networks is essential for reaping these networks' full potential, a factor not included in Kane and Alavi's (2007) analysis.

More specifically, the research presented in this dissertation clarifies the tension between these processes (i.e. bottom-up knowledge sharing around shared practices versus organizational level involvement to institutionalize knowledge in the organization) by pointing at the role of key actors in balancing the multiple requirements in order for NOPs to be conducive to both exploration and exploitation. Moreover, findings indicate that successful exploitation in the form of organizational-level learning does not necessarily happen at the cost of exploration; rather it can enhance knowledge sharing processes that in turn foster exploration. After all, higher levels of organizational embeddedness were associated with enhanced knowledge sharing activities, which in turn, is conducive to knowledge creation. This implies that exploration and exploitation are not necessarily incompatible as March (1991) suggested, but can be orthogonal as well (Gupta, Smith, & Shalley, 2006). This can be explained by the fact that both processes rely on different resources: practice-based knowledge creation by experts versus managerial involvement to identify and legitimize knowledge within the formal organization. However, as we have seen in chapters 2 and 3, these 'resources' may have conflicting interests which subsequently threatens the ambidextrous potential of intra-organizational NOPs (Gupta et al., 2006). A balance in control and autonomy is accordingly called for (Anand, Gardner, & Morris, 2007; Brown & Duguid, 2000; Cardinal, Sitkin, & Long, 2004; Robertson & Swan, 2003; Thompson, 2005) as well as social integration which may help to reconcile different interests. This last point, was previously suggested by Jansen et al., (2008), but supported by the studies presented in this dissertation.

5.4 Managerial Implications

The research presented in this dissertation shows that coordinating NOPs involves three types of embeddedness that management, leaders, or core members can support or hinder.

First, the findings of this dissertation show that because the engine driving NOPs is the embeddedness of network exchanges in the practices of the members, this mechanism should

not be overruled by organizational level interests. This implies that topics for discussion emerge bottom-up and that network activities revolve around sharing experiences and collective problem solving. In order to retain alignment with these practices, action might need to occur, for example, creating sub-groups around specific themes, or identifying common issues. NOP leaders should be experts in the field, able to recognize what is of interest to the members.

Second, creating social embeddedness is important for reaching mutual understanding and for integrating knowledge at the NOP level. This can be fostered by organizing face-to-face meetings, introducing new members, and keeping who-is-who lists up to date. In addition, reaching shared understanding is fostered by integrating knowledge more explicitly by, for example, drawing conclusions from discussions. Again, it helps if leaders are experienced in the field and have strong social networks within in the organization.

Third, to foster organization level learning, the network activities need to be aligned with those of the formal organization. Involvement on behalf of higher level managers is accordingly warranted in order to broker between the network and the formal organization, while at the same time, buffering the network from too much top-down interventions to ensure that activities stay connected to local practices. Managers could observe the network interactions and highlight 'lessons learned' that may be adopted by or integrated in the organization. Alternatively, managers could take the opposite approach by trying to align the network activities to the organization by, for example, communicating about developments within the formal organization that might affect the practices of the members; this approach may direct attention of the network members to these organizational issues. However, while interventions aimed at increasing organizational value may seem tempting, caution is advisable because intrinsic motivations for bottom-up knowledge sharing are easily overruled. This is especially advised to prevent NOPs from becoming virtual teams.

The Brokering and Buffering activities represented in table 3.5 (p. 95) provide several concrete activities and practices that NOP leaders can enact to deal with the multiple requirements they are facing. Table 4.2 (p. 119) provides an overview of activities that core members perform that support the learning processes.

5.5 Limitations of Dissertation

The largest limitation of this dissertation pertains to its generalizability; each study analyzed a single company which makes it unwarranted to generalize our findings across a variety of other intra-organizational NOPs. Instead of such statistical generalization, our study provides

an alternative type of generalization (Lee & Baskerville, 2003; Walsham, 1995), “analytic generalization” (Yin, 1994, p. 32), making this dissertation valuable in terms of developing new concepts (i.e. four types of embeddedness, two leadership strategies, core members and the roles they fulfill), providing rich insight and generating theory regarding the coordination of NOPs and how they contribute to organizational learning. Generalizations of interpretive case studies are tendencies rather than predictions (Walsham, 1995, p. 80): through pattern matching I, for example, revealed that a B&B strategy tends to better support organizational learning than a C&C strategy; by doing so, I shed light on the *causal mechanisms* (i.e. how X and Y interrelate) between leadership strategies and organizational learning but by no means measure the *causal effect* of leadership strategy on organizational learning (Gerring, 2004). Indeed, quantifying causal effects was never intended.

In line with this, making causal inferences is even more difficult considering the limited time span covered in the reported studies. Since the evolution of NOPs over time was not included in the analysis, I did not provide insights into the long term effects of management interventions, leadership strategies and learning roles on distributed knowledge sharing and learning.

A second limitation of this dissertation is that, even though one of the key characteristics of NOPs is that they are supported by information and communication technology (Vaast, 2004; Wasko & Faraj, 2005), I did not take technology and its use into account. As discussed in paragraph 5.3.2, studying the coordination of NOPs by solely investigating uses, interpretations, work practices and role relations of network members resembles a network determinism approach and does not acknowledge the role that technology plays in these dynamics. As I argued in paragraph 5.3.3, technology might have had an effect on both learning processes and the coordination of NOPs as well. A pure social constructivist approach may thus have provided a too limited ontology to fully appreciate the dynamics of coordinating NOPs.

A third limitation is that I tended to treat individual, network, and organization level learning as compartmentalized levels with more or less distinct learning processes. I made these distinctions for analytic purposes and, even though this clear distinction between individual and organizational levels of learning (Goodman & Darr, 1998; Kim, 1993; March & Olsen, 1975), or individual, group and organizational levels of learning (Crossan et al., 1999), is well aligned with most organizational learning literature, the practice-based approach on learning suggests that ‘*knowledge circulates among and unites these various levels*’ (Gherardi, 2001, p.132). As such, learning at the individual, network, and

organizational level, as well the supporting learning processes should be interpreted as fluid knowledge flows crossing these multiple levels which may become more salient on one of these three levels, instead of understanding them as clear-cut differences between learning at these multiple levels.

Lastly, whereas the third study identified activities performed by core members, and unraveled how these activities support organizational learning, the first two studies focused solely on NOP leaders and managers. Even though all social groups tend to have a group of core members (Borgatti & Everett, 2000; Kilduff & Tsai, 2003; Ostrom, 2000), I did only take into account the role that core members of TDO's networks played. Even though this is justified because the scope of these studies was to investigate the role of management and NOP leaders in coordinating NOPs, it is nevertheless very likely that knowledge sharing, and the learning processes in TDO's networks, did, at least partly, depend on their (core) members as well.

Future research is needed to address these limitations and increase our understanding of how intra-organizational NOPs are coordinated to support knowledge sharing and organizational learning. The next section outlines some promising avenues to make progress in this area.

5.6 Suggestions for Further Research

A general suggestion for further research is to conduct more case studies to determine if the analytic (and statistical) generalization of these results could be strengthened. To overcome the limitations inherent in cross-sectional research, longitudinal research is called for. Besides investigating long term effects of management interventions, leadership strategies and membership roles on knowledge sharing and organizational learning, a longitudinal study could also indicate whether the dynamics of the different relationships in our model change over time. Such research would therefore contribute to our understanding of the evolution of social networks (Kilduff & Tsai, 2003).

More research is needed to clarify some of the main differences observed between the two case studies. First, I encourage NOP research in different settings that will further examine how and when learning tensions are likely to arise between the interests of the members and the formal organizational. It might well be that the extent to which the knowledge management dilemma surfaces depends on the type of organization and the practices of the organizational members. In line with this, future research could provide a more detailed understanding of how management and NOP leaders can deal with divergent

interests and balance the multiple requirements inherent to coordinating NOPs. A more detailed understanding of what type of management interventions are acceptable to support institutionalizing processes would, for example, help managers understand their role in overcoming the knowledge management dilemma. More specifically I encourage studies to explore how and to what extent the coordination of intra-organizational NOPs can be self-organizing while also contributing to knowledge integration at organizational levels. Although it is too early to confirm, results from this dissertation imply that when tension between the interests of the formal organization and those of the network members is less apparent (as in TCC), informal leadership might suffice, whereas, in NOPs facing greater learning tensions, more formalized (lateral) authority structures are required to leverage this tension (as observed when leaders enacted the B&B strategy). Given the growing interest in NOPs for organizational learning purposes among both organizational practitioners and scholars, more research on the role of NOP management, leaders, and members would be highly welcomed.

As an alternative to technological or network determinism, future studies could respond to calls for research that take IT and its affordances into account when studying organizational processes (see e.g. Zammuto, Griffith, Majchrzak, Dougherty, & Faraj, 2007). Such an approach should appreciate that technology has material constraints and affordances that may influence how people collaborate and organize themselves. Moreover, these technologies will be affected by how people use them, leading to continuous entanglement of both the socio- and material part of IT and organizing (Leonardi & Barley, 2010; Wanda J. Orlikowski, 2000, 2007). One way to analyze this interplay is to look at “affordances” (Zammuto et al., 2007) which are “*functional and relational aspects which frame, while not determining, the possibilities for agentic action in relation to an object*” (Hutchby, 2001, p. 444). Affordances are not simply capabilities of the technology itself, they result in the interconnection of technological capabilities and the practices of people using the technology (Leonardi, 2011). Affordances are thus a particularly useful lens for studying the interplay between technology and new forms of organizing (Zammuto et al., 2007). Such a perspective could for example be used to study how the rise in social media use affects the emergence and dynamics of NOPs.

5.7 Concluding Remarks

I began this dissertation by proposing we ‘join the dance’ to best make sense of the changes that modern organizations face in light of ever increasing globalization, the knowledge economy, and the rise in ICT that is becoming increasingly interwoven with organizing processes. As suggested by the root-cause analysis of the BP oil spill disaster, coordinating dispersed expertise can be of utmost importance to an organizations’ (and its environments’) endurance. The studies presented in this dissertation expose how knowledge sharing and organizational learning processes in distributed contexts may take shape. Studying the dynamics of coordinating intra-organizational NOPs as loci for distributed learning, revealed that their coordination entails delicate balancing acts between too much and too little managerial involvement, between the organizational level’s interest to institutionalize learning outcomes and the practice-based interest of the members, between process and practice, and, in sum, to reconcile ‘firm-based principles’ with ‘community-based principles.’ Even though it might be too simplistic to claim that the BP Oil spill could have been completely prevented if well coordinated NOPs had developed, nevertheless the research presented in this dissertation may help organizations like BP to improve their, often critical, knowledge processes. I trust to have contributed to both theory and practice by illuminating how coordinating NOPs resembles walking a tightrope and by unraveling the dynamics integral to keeping your balance.

5.8 References

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