

ENGLISH SUMMARY

This thesis is about knowledge-intensive work that is organized in collaborations across boundaries. We observe that, whereas the world of practice has placed greater emphasis on such “cross-boundary collaboration” to organize and execute knowledge-intensive work, we have yet to develop theoretical frameworks that help us understand its true impact on how work is accomplished in actual practice and changing the very nature of work. Advances in digital technology, information and communication technologies, together with a globalized economy, have contributed to the increased permeability of the traditional boundaries of firms, as they adopt more open organizational models. Today, knowledge-intensive work is often taking place in collaborative settings that span different contexts (e.g., professional, societal, firm, industry). Such collaborations can involve experts from inside and outside the organization, who are often geographically distributed.

In the *Introductory Chapter*, I discuss how scholars of organizations have studied collaborations taking place within and across organizations, thereby identifying the antecedents leading to effective collaboration (e.g., having the right people), the organizational objectives for which cross-boundary collaboration can best be employed (e.g., to foster innovation), as well as its inherent challenges (e.g., high coordination costs). However, what is left unexplained is how carrying out knowledge-intensive work across multiple contexts (or fields) works out in actual practice. This is problematic because the organization and execution of work are interdependent and hence, the move towards organizing work in cross-boundary settings will hold implications for the work itself (e.g., the people doing the work, the arrangements around the work, the technology used to perform the work, and the very purpose of the work may change).

The issue of cross-boundary collaboration has also been considered in organizational scholarship on boundaries. This literature argues that when work tasks are carried out across boundaries, this requires a competence in boundary spanning. The heterogeneity among individuals is often found to be most challenging, especially in global contexts, where people are separated by multiple boundaries and differ significantly in terms of their status, knowledge, culture, and language. Therefore, individuals not only need to be skilled in the work they do, but also have know-how about working together with people who may have very different knowledge, work practices, and interests.

Practice researchers have contributed to our understanding of how to enable collaboration in cross-boundary settings, for instance by appointing bicultural immigrant managers in boundary-spanning roles or by relying on shared digital or material objects such as prototypes, design or assembly drawings. Yet, what has received scant attention is the processes through which individuals come to understand and negotiate boundaries between them, and which delineate their knowledge, work practices, and identities. This is problematic because in the absence of shared work practices, completion of the work across boundaries tends to depend more on the ability of people to improvise and develop shared work practices across their respective practice contexts. I therefore argue that working across contexts has implications for the very boundaries that previously defined the work, and associated autonomy and status relations.

A focus on boundaries, how actors come to perceive, (re-)negotiate, and (re-)configure boundaries between them, and how such "*boundary work*" affects the very work processes through which knowledge-intensive work is accomplished, may help to address this gap. I therefore ask the question: "*How do individuals in organizations enact boundary work to execute knowledge-intensive work in cross-boundary collaboration?*"

The Theory. The purpose of this Chapter is essentially fourfold. First, I review existing research on boundaries and describe how they have developed into three distinct streams of literature on boundary spanning, boundary objects and boundary work. Boundary spanning and boundary objects literatures tend to describe mechanisms that can enable cross-boundary collaboration. Boundary work literature, in turn, focuses on the process through which individuals continuously (re-)negotiate boundaries between them and their respective contexts. I conclude that while boundary work forms a central topic in sociological literature, it has received relatively scant attention in organization and management literature on cross-boundary collaboration.

Second, I discuss how scholars of organizations have held different and sometimes conflicting conceptualizations of the term "boundaries". This leads to contestation around its value as a concept. Early organizational research tends to highlight the structural and systemic aspects of boundaries, viewing them as real and relatively stable aspects of social systems that demarcate distinct domains of (inter)action. However, by perceiving such (social) boundaries as relatively unambiguous and unproblematic, there have been

relatively few in-depth studies of boundaries themselves and actors' engagements in boundary work.

More recent literature has brought to light the socially constructed and cognitive aspects of boundaries, viewing them as relatively fluid and subjective processes through which actors delineate their identities, knowledge, and practices. However, by perceiving such (symbolic) boundaries as cognitive constructions that exist solely inside people's minds, this perspective lacks theoretical potential for explaining the concrete activities and contextual conditions under which boundaries become salient and are dealt with in organizational contexts. I conclude that, in order to advance our understanding of boundary dynamics, further conceptual development is needed around what we mean when we talk about boundaries.

Third, to address these shortcomings, I introduce a relational view of boundaries and adopt a practice-theoretical framework to study how boundaries themselves are changing when individuals carry out knowledge-intensive work across them. I define "boundaries" as those differences that come to demarcate distinctions between groups from different practice contexts and gain salience in work practices that are differentially recognized and rewarded across them. When individuals collaborate across contexts, they need to establish new relations, sort out differences between them, and create a shared set of practices. But creating shared practices also holds implications for the boundaries that previously defined the work and associated power and autonomy relations. This makes collaborating across boundaries far from a neutral process. It is the reason why boundaries become salient in cross-boundary collaboration and their negotiation is often associated with struggles over power, resources, status, and autonomy. In this context, I define "boundary work" as the socio-symbolic processes through which individuals from different contexts try to (re-)negotiate or (re-) configure boundaries between them, to achieve either greater integration or differentiation of people and their work practices.

Fourth, I identify three limitations of this theoretical framework: We have yet to understand empirically: (1) how boundaries become salient for individuals in their everyday work activities, (2) how their boundary work impacts the execution of knowledge intensive work, and (3) the conditions under which they enact particular forms of boundary work. Together, these limitations informed the central research question of this thesis: How

individuals in organizations enact boundary work when knowledge-intensive work is organized in cross-boundary collaboration.

Research approach and methods. This thesis is based around the central argument that organizing knowledge-intensive work in cross-boundary settings is profoundly changing the way work is accomplished. Conceptualizing those elements of work that are affected by these changes requires detailed empirical study. My research was aimed at theory development and so I followed an abductive research approach. The practice-theoretical lens developed in Chapter Two made me aware that issues pertaining to boundaries and collaboration tend to be deeply embedded in everyday practice. To trace how boundaries become salient, are enacted by individuals through their boundary work, and impact the way they execute knowledge-intensive work, asks for deep and prolonged engagement in the field. I therefore adopted a process research approach and conducted a longitudinal, multi-sited field study of “Mirai Corporation” - a technology-based multinational corporation from Japan.

Data collection comprised two 12-month periods of fieldwork, carried out between September 2009 and May 2013, and spanning twelve locations throughout Asia and Europe. I focused on three sub-cases of cross-boundary collaboration, involving divisional managers, engineers, and research scientists from Mirai’s technology division “Mirai Technologies”, that were aimed at developing a joint approach to strategy (Ch. 4), coordinating complex engineering design work (Ch. 5), and developing and implementing a new technological innovation (Ch. 6). To this aim, I conducted an estimated 760 hours of (non-)participant observation, 114 semi-structured interviews and collected numerous documents. Data analysis focused on the processes and practices through which individuals involved in these initiatives created common ground, coordinated their work, and shared their knowledge, for which I combined techniques from grounded theory and process research. This allowed me to develop insight into the micro-processes of boundary work and their role when knowledge-intensive work is organized in cross-boundary settings.

Findings. Chapter Four is based on the first sub-case: an “open strategy” initiative, involving senior managers from Japan and Europe, that was aimed at making strategic decision-making processes more inclusive, integrated, and transparent. Its theory development efforts are focused on the relation between boundary work and creating

common ground for collaboration. While common ground is important for realizing effective collaboration, differences in work practices may come to demarcate distinctions between people that prevent the creation of sufficient common ground. In this Chapter, I study how senior managers involved in an open strategy initiative make sense of differences between them as boundaries, and informing their boundary work, thereby asking the question: “How do strategists make sense of and enact boundaries to create common ground for open strategy making?” The answer to that question depends on what boundaries become salient for individuals and are acted upon. Strategists may cope with boundaries between them, depending on how they make sense of and give sense to observed boundaries-in-practice, and thereby impacting their ability to create common ground for open strategy making. Whereas mutually “opening-up boundaries” (e.g., similar to the act of opening a door) can help to create common ground, subtle dynamics of “breaching” versus “maintaining boundaries”, or more explicit ones of “eliminating” versus “bolstering boundaries”, can prevent sufficient common ground being created to successfully execute strategy work in cross-boundary settings. At Mirai Technologies, the boundary work enacted by divisional managers to realize integrated strategy making in the end prevented their strategy processes to become truly integrated. I discuss the implications of these findings for literatures on open strategy, strategic sensemaking, and boundary scholarship

Chapter Five is based on the second sub-case: a multiparty engineering collaboration called the “Gyakuten Project”, involving four groups of engineers from Japan, China, Belgium, and the Netherlands. Its theory development efforts center around the relation between boundary work and coordination. Whereas in organizations coordination is usually achieved through existing processes, practices, and mechanisms, in multiparty projects such as the Gyakuten Project, individuals need to develop joint processes and mechanisms for coordination, while simultaneously complying with those of their respective parent organizations. In this Chapter, I study how boundary work plays a role in balancing project and organizational requirements for coordination, thereby asking the question: “How do individuals in organizations enact boundary work to coordinate their work tasks in a complex multiparty collaboration?” The answer to that question lies in the way parties reconcile project requirements for coordination with organizational ones. I found that depending on their unfolding interests, parties may either mutually open up or

create boundaries between them. When interests of the project remain aligned with organizational ones, collaborating parties may open-up boundaries, allowing frequent and intense interactions, and thereby facilitating the emergence of joint coordination mechanisms that support the timely execution of work tasks in line with latest project objectives. However, when under pressure, individuals may start to prioritize organizational interests and create boundaries in their relations with other parties. This prevents frequent and intense interaction and instead allows them to individually coordinate work tasks. In the Gyakuten Project, Japanese and Chinese engineers were separated by multiple boundaries, yet they still found a way to successfully coordinate their work across them. However, while Dutch and Belgian engineers were separated by fewer boundaries, they failed to adequately coordinate their work, thereby preventing the timely realization of project objectives. I discuss the implications of these findings for literatures on emergent coordination processes and boundary work.

Chapter Six is based on the third sub-case: a radical innovation project called "Project Hogo", involving research scientists, engineers, and operators from Japan and the Netherlands. Theory development in this Chapter is focused on the relation between boundary work and knowledge sharing. While we know that knowledge is embedded in practice and the use of shared objects and practices can facilitate knowledge sharing across groups, we do not know how, once novel knowledge has been developed in a cross-boundary setting, it can be shared with adopters in the implementation context. In this Chapter I study how individuals in Project Hogo enact boundary work to implement the radical innovation Exomin. In order to share their knowledge with engineers and operators, Hogo-members had to continue enacting the work practices in which their innovation knowledge was embedded. However, they were also pressed to transform those very practices in order to comply with the norms and rules of the implementation context. I therefore ask the question: "How does the boundary work of innovators and adopters affect their ability to share knowledge during implementation? The answer to that question lies in how individuals balance pressures to maintain sufficient shared context to socialize and share knowledge with new members while simultaneously having to adapt to the implementation context. "Opening-up" team boundaries may help to share knowledge when there is sufficient continuity of practice inside the team for new members to be socialized into. However, knowledge sharing may be less successful when there's a high

turnover rate and new members cannot be socialized into existing work practices of the team. They will “maintain” boundaries so that they can continue to work according to familiar norms work practices of the implementation context, thereby preventing knowledge sharing. This explains why in Project Hogo, team members realized initial implementation in their distributed pilot plants within the remarkable timeframe of six months, yet they nevertheless ran into trouble when implementing Exomin in a large-scale production facility. I discuss the implications of these findings for literatures on innovation implementation and cross-boundary knowledge sharing.

Contributions. *Chapter Seven* outlines the implications of the above findings for organization and management theory and practice. I found that firms initiate cross-boundary collaborations to carry out knowledge-intensive work, ranging from strategy making, to engineering design work, or technological innovation. Organizational members, involved in such collaborations, may “open up” or “transform boundaries” between them in their efforts to develop shared work processes that enable them to jointly carry out the task at hand. However, individuals can also “create” or “maintain boundaries”, for instance when they wish to maintain their autonomy or continue to work according to established processes and practices. These findings complement existing literature on *collaboration* by highlighting how developing joint work practices between people from different contexts requires them to address boundaries between them - which I conceptualize as boundary work. The thesis also complements commonplace logics of culture to explain the challenges, processes and outcomes of collaborations that span culture and country contexts. Instead, I argue for further unpacking what we mean when we talk about culture, and for researchers and practitioners alike to be sensitive to differences other than culture that can come to demarcate boundaries. This thesis also contributes to existing literature describing *boundary dynamics* by focusing on the socio-symbolic processes around boundaries, through which boundaries emerge, are negotiated, and continuously (re-) configured. I thereby advance our conceptualization of boundary work in organizational settings, arguing that what differences individuals put in play to demarcate a boundary, and how they enact them, depends on the context - how they frame the situation, what interests are at stake, and their ability to move away from institutional norms and practices of their respective parent contexts.