

APPENDIX

I. Definitions of core concepts

Boundaries: Those differences that demarcate distinctions between actors from different practice contexts (or fields of practice) and gain salience in practices that are differentially recognized and rewarded across contexts (Abbott, 1995; Levina and Vaast, 2008).

Boundary objects: Those objects that have a capacity to facilitate knowledge sharing and establishing a shared context for collaboration at a boundary (Star and Griesemer, Carlile, 2002).

Boundary spanning: The activities that facilitate interaction and contribute to the combination of diverse knowledge and interests of actors that are separated by boundaries (e.g., Barner-Rasmussen et al., 2014; Kane and Levina, 2017; Rosenkopf and Nerkar, 2001).

Boundary work: The socio-symbolic processes through which actors try to (re-)negotiate or (re-)configure boundaries to achieve either greater integration or differentiation between actors from different practice contexts (Gieryn, 1983; Lamont and Molnar, 2002; Zietsma and Lawrence, 2010).

Bolstering boundaries: A form of boundary work in which actors from context A resist pressures to change their practices to those of context B, for instance by strengthening their position in the organization.

Breaching boundaries: A form of boundary work in which actors from context A persuade actors from context B to adapt their practices to those of context A, for instance by referring to formal organizational procedures or regional/global business practices.

Creating boundaries: A form of boundary work in which actors in context A differentiate their practices from other actors in that same context or when collaborating with actors from another context, for instance to individually coordinate work tasks.

Eliminating boundaries: A form of boundary work in which actors from context A use their power to force actors from context B to adopt their practices, for instance through efforts to change formal organizational structures.

Maintaining boundaries: A form of boundary work in which actors from context A refuse to adapt their work practices to the ones of actors in context B and keep enacting established work practices, for instance by emphasizing that work processes are different in their organizational context.

Opening-up boundaries: A form of boundary work in which actors from context A emphasize a shared identity and create shared work practices with actors from context B, through mutual and voluntary adaptation of their existing work practices.

Collaboration: A relational process in which actors from different practice contexts work together by developing shared rules, norms, and structures and jointly decide on issues related to a shared interest or problem (Beck and Plowman, 2014, p. 1235; Hardy et al. 2005, Wood and Gray 1991).

Cross-boundary collaboration: Collaborations that deliberately or inadvertently relate actors that are separated by one or more boundaries (e.g., Levina and Vaast, 2014, p. 286).

Effective collaboration: Collaboration that leverages differences among actors to produce innovative, synergistic solutions that balance divergent stakeholder concerns (Hardy et al., 2005, p. 58; Levina, 2005, p. 110).

- Multiparty collaboration:** A form of cross-boundary collaboration that involves three or more groups of actors who work together towards realizing collectively agreed-upon outcomes (De Clercq et al., 2008, p. 1170; Levina, 2005; Levina and Vaast, 2008, p. 306).
- Common ground:** The sum of mutual, common, or joint knowledge, beliefs, and suppositions that creates shared understanding and affiliation across groups (Bechky, 2003: 321; Clark, 1996, p. 93; Cramton, 2001, p. 346).
- Coordination:** The process through which actors structure their interdependent actions in a way they believe will enable them to realize a collective performance (Faraj and Xiao, 2006; Malone and Crowston, 1990; Okhuysen and Bechky, 2009; Quinn and Dutton, 2005)
- Innovation implementation:** The critical process between the adoption of an innovation and its routine use in organizations, during which adopters of an innovation ideally become increasingly skilled, consistent, and committed to using an innovation (Klein and Knight, 2005; Klein and Sorra, 1996, p. 1057).
- Institutional norms:** The shared meaning systems of actors in a particular practice context that are encoded in the taken-for-granted practices of that context (Clemens and Cook, 1999, p. 442; Furnari, 2016, p. 4)
- Practice:** The embodied and materially-mediated doings and sayings of actors, and their interconnections, that are organized around certain objects or ends and take place in the everyday interactions among actors (Carlile, 1997; Lave, 1988; Nicolini, 2012, p. 53; Schatzki, 2001, p. 2).
- Practice context** (or field of practice): The contexts in which practices are historically and locally situated and which unite actors in their pursuit of a common interest (Levina and Vaast, 2005; 2014)
- Sensemaking:** The socio-symbolic processes through which organizational actors construct meaning and interpret social phenomena that are somehow non-routine, surprising, or confusing to them (Cornelissen, 2012; Maitlis and Christianson, 2014; Maitlis and Sonenshein, 2010; (Weick, 1995)).
- Boundary sensemaking:** A form of sensemaking in which actors construct meaning and interpret differences in practices as boundaries.
- Noticing boundaries-in-practice:* A form of boundary sensemaking in which actors observe a particular boundary as it becomes manifest in practice,
- Interpreting boundary origins:* A form of boundary sensemaking in which actors attribute an observed boundary-in-practice to a specific origin that explains why the boundary exists.
- Boundary sensegiving:** A form of sensemaking in which actors specify for others the origins of observed differences in practices and, explaining to them why that boundary exists.
- Socio-symbolic work:** The engaged and purposeful efforts of actors to manipulate some aspect of their social context (Phillips and Lawrence, 2012, p. 224).
- Strategy making:** The dynamic process of knowledge production, interpretation, and transformation that is accomplished through the ongoing (inter)actions and negotiations of multiple actors (Jarzabkowski and Balogun, 2009; Kaplan, 2011; Miller, 1987; Whittington, 2006).
- Open strategy making:** The variety of practices that promote transparent and inclusive strategy making (openstrategynetwork.com; Hautz et al., 2017, p. 2) across the conventional boundaries that define the realm of strategists.

II. Sample interview guide for data collection period 1

This interview guide was developed in 2009 for the first round of data collection. The questions evolved from interview to interview. I asked clarification questions, summarizing questions, and questions for more detail along the way. The guide below was used for the interviews with Japanese managers from MTech's management team. The guide was modified when interviewing participants involved in the other collaborations studied, and translated into Dutch when interviewing Dutch participants.

The following questions came after interviewee background questions.

1. In which areas of your work do you work together with Dutch employees?
2. Do you also have contact with your Dutch colleagues outside the workplace?
3. In your experience with Dutch employees, did you notice differences in the way of working between Japanese and Dutch employees?
 - a. Can you tell something about how meetings proceed and how decisions are being made in the company?
 - b. Is there a difference in the process of decision-making when this decision process involves only Japanese/Dutch employees, or when this involves both Japanese and Dutch employees?
4. How do you think such differences affect work processes within the company?
5. In your experience, have there been occasions in which differences between Japanese and Dutch employees resulted in any misunderstandings or conflicts?
 - a. (If yes) Can you give an example of this?
 - b. How did you deal with this?
 - c. (How) was the misunderstanding/conflict solved?
6. Can you tell something about any cultural differences you experienced in working together with Dutch employees?
 - a. How did these cultural differences influence the collaboration?
7. Has there been a specific occasion, that you remember well, in which you experienced differences in culture or in the way of working between Japanese and Dutch employees?
 - a. What did this incident/experience mean to you?
 - b. How did this influence your work or the collaboration more generally?
 - c. How did you deal/handle this at that time?
 - d. How do you currently deal with such differences?
8. One of the aspects of working in an international company is that collaboration is mainly virtual. How do you experience this virtual dimension in the Japanese-Dutch collaboration within the company?
 - a. How do you think that the different local contexts influence the collaboration?

Closing questions

9. How do you think that the Dutch employees think about the Japanese?
10. How are experiences with working with people from different cultural backgrounds shared within the company?
11. How do you think that the collaboration between the Japanese and Dutch part of the company could be further improved?
12. Which advice would you personally give to new employees about how to work effective and successfully with the Dutch?

III. Sample interview guide for data collection period 2

This interview guide was developed in 2012 for the second round of data collection, when initial data analysis indicated that cultural frameworks were not helpful in interpreting what was going on in the collaboration studied. The questions evolved from interview to interview. I asked clarification questions, summarizing questions, and questions for more detail along the way. The guide below was used for the interviews with Japanese members of MTech's divisional management team members. The guide was modified when interviewing participants involved in the other collaborations studied, and translated into Dutch when interviewing Dutch participants.

1. How has the collaboration developed over time? (any changes)
2. Can you tell me with whom you work with most at the moment and why?
3. How does the collaboration take place in practice?
4. Can you tell me something about how the collaboration is coordinated/managed?
5. What are important factors that influence the collaboration?
6. What are the advantages of a distributed Japanese-Dutch management team?
7. What do you like/find positive about the collaboration?
 - a. Can you give an example of that? (remember event)
 - b. What caused that? (causes)
 - c. Do you think others experienced this [causes] similarly?
 - d. What kind of effect did this [causes] have on collaboration within the team?
8. What do you find especially difficult about the collaboration? (negative factors/disadvantages)
 - a. Could you give me an example of that? (remember event)
 - b. What caused that? (causes)
 - c. What did this [causes] mean for you? (interpretation/experience)
 - d. How did you deal with that [causes] at the time? (actions taken)
 - e. Do you always deal with that [causes] in this way?
 - f. Do you think others experienced this [causes] in a similar way?
 - g. Have you experienced them [causes] again after that?
 - h. How would you deal with it now?
9. What kind of effect did this [causes] have on the collaboration in the team?
 - a. Do you always try to solve/tackle them [causes]?
 - b. Do differences always have to be bridged?
 - c. And how is that with the other team members?

Closing questions

10. How do you experience being part of this team?
 - a. How satisfied are you with how collaboration in the team proceeds?
 - b. Do you consider the collaboration a success?

Control questions

11. You have just mentioned various things that could be a barrier to collaboration in the team. Could these things also be advantageous/positive to the team?
12. Well known causes/factors that influence the process of collaboration are [name which have been mentioned by others]. These have not been mentioned in our conversation. Can you tell me if and how you experience these in the collaboration?

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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.

NEDERLANDSE SAMENVATTING

Dit proefschrift gaat over kennisintensief werk dat wordt georganiseerd en uitgevoerd in grensoverschrijdende samenwerkingsverbanden (*cross-boundary collaboration*). Vanuit de praktijk is er veel interesse in grensoverschrijdende samenwerking als organisatievorm om kennisintensief werk uit te voeren. Wat echter ontbreekt is voldoende theoretisch inzicht in hoe dit leidt tot veranderingen in werkpraktijken. Ontwikkelingen in digitale technologie, informatie- en communicatiemiddelen, tezamen met een groeiende wereldeconomie, leiden er mede toe dat traditionele bedrijven in toenemende mate hun grenzen (*boundaries*) herzien, en een meer open organisatiemodel hanteren. Tegenwoordig vindt werken over grenzen veelal plaats in samenwerkingsverbanden die meerdere professionele en organisatorische velden overbruggen. Experts van zowel binnen als buiten de organisatie, en vanuit verschillende geografische locaties, kunnen in zulke grensoverschrijdende samenwerkingsverbanden worden betrokken.

In de *Introductie* van mijn proefschrift beschrijf ik hoe organisatiewetenschappers deze samenwerkingsverbanden hebben bestudeerd. In studies naar samenwerking tussen organisaties en binnen organisaties is er veel aandacht voor factoren die kunnen bijdragen aan effectieve samenwerking, de organisatiedoelstellingen waarvoor grensoverschrijdende samenwerking een goede organisatievorm kan zijn, en de inherente uitdagingen en complicaties die het met zich meebrengt. Echter, wat buiten beschouwing wordt gelaten is een discussie omtrent hoe kennisintensief werk over de grenzen van meerdere velden heen in de dagelijkse praktijk wordt uitgevoerd. Dit is problematisch, aangezien het organiseren en uitvoeren van werk met elkaar in verband staan. Hierdoor zal het aangaan van grensoverschrijdende samenwerking consequenties hebben voor het werk zelf (zoals de doelstellingen van het werk, de gebruikte technologie, de indeling van het werk en de uitvoerende partijen).

Het onderwerp van grensoverschrijdende samenwerking wordt ook besproken in organisatieliteratuur die gaat over grenzen (*boundaries*). Deze literatuur beweert dat met name wanneer werk wordt uitgevoerd over meerdere grenzen van velden heen (bv. organisationele, professionele, en landsgrenzen), een zekere mate van deskundigheid in het overbruggen van die grenzen is vereist (ook wel *boundary spanning* genoemd). Een van de uitdagingen is de heterogeniteit van individuen, met name in internationale projecten

waar samenwerkende partijen verspreid kunnen zijn over meerdere velden en verschillen in hun status, kennis, taal en cultuur. Daarom dienen individuen niet alleen vaardig te zijn in het uitvoeren van het werk zelf, maar dienen ze ook goed te kunnen samenwerken met mensen die andere kennis, werkpraktijken en interesses hebben.

Studies uitgevoerd vanuit een zogenoemde “practice” benadering hebben een belangrijke bijdrage geleverd aan ons inzicht in de factoren en mechanismen die samenwerken over grenzen kunnen bevorderen. Een voorbeeld hiervan is het introduceren van immigrantmanagers met een biculturele achtergrond (boundary spanners) of het gebruiken van gedeelde materiële of digitale middelen (boundary objects), zoals prototypes, designs, of bouwtekeningen, die een overbruggingsfunctie kunnen vervullen. Een onderwerp dat in de literatuur nog weinig aandacht heeft gekregen is hoe men grenzen van velden interpreteert en onderhandelt, en met deze grenzen verschillen in kennis, werkpraktijken en identiteiten definieert. Dit gebrek aan aandacht is problematisch omdat succesvolle voltooiing van werk sterk afhangt van het vermogen van mensen om gezamenlijk nieuwe werkpraktijken over grenzen heen te ontwikkelen. Deze nieuwe werkpraktijken hebben op hun beurt gevolgen voor de oorspronkelijke begrenzing van het werk, en bijbehorende autonomie, status en machtsrelaties.

Teneinde meer inzicht te verkrijgen in dit onderwerp, gaat mijn proefschrift over grenzen (boundaries), hoe mensen grenzen onderling interpreteren en onderhandelen, en hoe dit “grenzenwerk” (boundary work) consequenties heeft voor de werkprocessen waarmee kennisintensief werk wordt uitgevoerd. Ik stel daartoe de volgende onderzoeksvraag: *“Hoe nemen individuen in organisaties deel in grenzenwerk binnen de context van grensoverschrijdende samenwerking voor kennisintensief werk?”*

De Theorie. Het doel van dit hoofdstuk is vierledig. Ten eerste bespreek ik bestaand Management en Organisatieonderzoek naar grenzen. Ik onderscheid drie stromingen: boundary spanning, boundary objects, en boundary work. In de literatuur over boundary spanning en boundary objects worden verschillende mechanismen beschreven die grensoverschrijdende samenwerking kunnen bevorderen. Literatuur over “grenzenwerk” (boundary work) beschrijft de processen waarmee individuen continu grenzen onderling en tussen hun respectieve velden onderhandelen. Ik concludeer dat, alhoewel grenzenwerk een centraal onderwerp vormt in de Sociologie, het nog weinig aandacht heeft verkregen in Management en Organisatiewetenschap naar grensoverschrijdende samenwerking.

Ten tweede bespreek ik hoe organisatiewetenschappers verschillende en soms botsende definities hanteren van de term "grenzen". Dit leidt tot discussies rondom de waarde van deze term als theoretisch concept. In vroeg organisatiewetenschappelijk onderzoek richtte men zich vaak op de structurele en systemische aspecten van grenzen. Deze studies beschouwen grenzen als duidelijk definieerbare en relatief stabiele aspecten van sociale systemen, die concrete velden afbakenen. Echter, door zulke (sociale) grenzen als statisch en dus onproblematisch te zien, is er weinig diepgaand onderzoek naar grenzen zelf en hoe mensen deelnemen in "grenzenwerk".

Meer recentelijk onderzoek richt zich veelal op de sociale en cognitieve aspecten van grenzen, door ze te beschouwen als relatief dynamische en subjectieve processen waarin individuen hun identiteit, kennis en werkpraktijken definiëren. Vanuit dit perspectief worden deze (symbolische) grenzen gezien als cognitieve constructies, die alleen bestaan in de gedachten van mensen. Hierdoor is dit perspectief minder krachtig in het verklaren van de concrete activiteiten en situaties waarin grenzen zichtbaar worden. Ik concludeer dat voor het verkrijgen van een beter begrip van grensdynamieken, we eerst beter moeten definiëren wat we eigenlijk bedoelen wanneer we het hebben over grenzen.

Ten derde, om deze tekortkomingen te adresseren, introduceer ik een relationeel perspectief van grenzen en hanteer ik een "practice"-theoretisch perspectief in mijn onderzoek naar grensoverschrijdende samenwerking. Hierbij definieer ik grenzen als verschillen die saillant worden tussen groepen uit verschillende velden en die zich openbaren in werkpraktijken die verschillend gewaardeerd en herkend worden door deze groepen. Wanneer individuen samenwerken over meerdere velden, moeten ze eerst nieuwe relaties vormen, onderlinge verschillen uitzoeken, en gedeelde werkpraktijken ontwikkelen. Dit laatste heeft echter implicaties voor de grenzen die oorspronkelijk het werk afbakenden en bijbehorende autonomie en machtsrelaties. Dit maakt grensoverschrijdende samenwerking verre van een neutraal proces. Het is juist daarom dat grenzen saillant worden, en het onderhandelen van die grenzen vaak gepaard gaat met discussies omtrent de verdeling van macht, kapitaal, status en autonomie. In deze context definieer ik "grenzenwerk" (boundary work) als de sociaal-symbolische processen waarin individuen van verschillende groepen en velden onderlinge grenzen onderhandelen en (her-)configureren. Dit om een betere integratie of juist differentiatie van groepen en hun werkpraktijken te realiseren.

Ten vierde identificeer ik drie beperkingen van dit theoretisch kader. Wat nog empirisch onderzocht moet worden is (1) hoe grenzen saillant worden voor individuen in hun dagelijkse werkzaamheden, (2) hoe het deelnemen in grenzenwerk de uitvoering van kennisintensief werk beïnvloedt, en (3) de condities waaronder individuen deelnemen in specifieke vormen van grenzenwerk. Tezamen leiden deze drie beperkingen tot de centrale onderzoeksvraag van dit proefschrift: Hoe individuen in organisaties deelnemen in grenzenwerk binnen de context van grensoverschrijdende samenwerking voor kennisintensief werk.

Onderzoeksaanpak en methoden. Dit proefschrift is opgebouwd rond het centrale argument dat het organiseren van kennisintensief werk in grensoverschrijdende settings een verregaande verandering teweegbrengt in de uitvoering van werk. Het identificeren van welke elementen van werk precies door deze veranderingen worden aangetast vereist gedetailleerd empirisch onderzoek. Mijn onderzoek was gericht op het ontwikkelen van theorie, en dus volgde ik een abductieve onderzoeksfilosofie. De “practice” benadering beschreven in Hoofdstuk Twee heeft mij doen realiseren dat zaken die te maken hebben met grenzen en samenwerking vaak diep geborgen liggen in de dagelijkse werkpraktijk. Het analyseren van hoe grenzen zichtbaar worden, door individuen worden onderhandelt, en kennisintensief werk beïnvloeden, vraagt daarom om een diepe en langdurige betrokkenheid in het veld. Daarom heb ik een procesgerichte onderzoeksbenadering gehanteerd, en een longitudinaal onderzoek uitgevoerd binnen het bedrijf “Mirai Corporation”, een technologische multinational uit Japan.

Dataverzameling bestond uit twee veldwerkperiodes van 12 maanden, die plaatsvonden tussen september 2009 en mei 2013. Het veldwerk vond op twaalf verschillende locaties plaats in Azië en Europa. Ik richtte mij hierbij op drie casussen van grensoverschrijdende samenwerking waarbij divisie managers, technologen en onderzoekers van Mirai’s technologiebranche, genaamd “Mirai Technologies” betrokken waren. Samenwerking binnen de drie casussen was gericht op het ontwikkelen van een gezamenlijke benadering voor strategieontwikkeling (hoofdstuk 4), het coördineren van complexe ontwerpwerkzaamheden van technologen (hoofdstuk 5), en het ontwikkelen en implementeren van een nieuwe technologische innovatie (hoofdstuk 6). In totaal voerde ik circa 760 uren aan (non-participerende) observatie uit, 114 semigestructureerde interviews, en verzamelde ik talloze documenten. Data-analyse was gericht op werkprocessen omtrent

het creëren van gemeenschappelijk begrip, het coördineren van werk, en kennisdeling. Hiervoor heb ik analysetechnieken gecombineerd uit de grounded theory en procesanalyse. Dit maakte het mogelijk om inzicht te verkrijgen in de microprocessen van grenzenwerk wanneer kennisintensief werk wordt georganiseerd in grensoverschrijdende samenwerking.

Resultaten. *Hoofdstuk Vier* richt zich op de eerste sub-casus: het ontwikkelen van een meer open proces van strategieontwikkeling, waarbij divisie managers uit Japan en Europa betrokken waren. Het doel van dit initiatief was om het proces van strategische besluitvorming meer inclusief, geïntegreerd en transparant te maken. Theorieontwikkeling in dit hoofdstuk richt zich op de relatie tussen grenzenwerk en het creëren van gemeenschappelijk begrip voor samenwerking. Hoewel gemeenschappelijk begrip belangrijk is voor effectieve samenwerking, kunnen verschillen in werkpraktijken een onderscheid tussen mensen markeren, wat het creëren van gemeenschappelijk begrip juist belemmert. In dit hoofdstuk bestudeer ik hoe divisie managers omgaan met onderlinge verschillen en deelnemen in grenzenwerk. Daarbij stel ik de vraag: "Hoe interpreteren strategieontwikkelaars onderlinge grenzen en hoe nemen zij deel in grenzenwerk voor het bouwen van een gemeenschappelijk begrip voor open strategieontwikkeling?" Het antwoord op deze vraag hangt af van wat voor soort grenzen saillant worden voor individuen en hoe zij daarop reageren. Hoe strategieontwikkelaars omgaan met grenzen lijkt dus afhankelijk te zijn van hoe waargenomen grenzen in de dagelijkse werkpraktijk worden geïnterpreteerd, en hoe dit op zijn beurt invloed heeft op het creëren van gemeenschappelijk begrip. Het wederzijds "openstellen" van grenzen (opening-up boundaries; denk bijvoorbeeld aan het openen van een deur) kan gemeenschappelijk begrip bevorderen. Subtiele dynamieken van enerzijds "grenzen doorbreken" (breaching boundaries) versus anderzijds "grenzen behouden" (maintaining boundaries), of meer expliciete dynamieken van enerzijds "grenzen elimineren" (eliminating boundaries) versus anderzijds "grenzen verstevigen" (bolstering boundaries) kunnen echter gemeenschappelijk begrip verhinderen. Binnen Mirai Technologies vormde het grenzenwerk van divisie managers uiteindelijk een belemmering voor de volledige integratie van het strategieontwikkelingsproces. Ik bespreek de implicaties van deze bevindingen voor organisatieliteratuur over open strategie, strategische betekenisgevingsprocessen (strategic sensemaking), en grenzen (boundaries).

Hoofdstuk Vijf richt zich op de tweede sub-casus: een technologische samenwerking tussen meerdere partijen, genaamd het "Gyakuten Project". Bij dit project waren vier groepen van ingenieurs betrokken vanuit Japan, China, België en Nederland. Theorieontwikkeling in deze studie focust op de relatie tussen grenzenwerk en het coördineren van werk. Hoewel coördinatie in organisaties vaak bereikt wordt door het volgen van reeds bestaande processen, methoden en mechanismen, is het in een samenwerking zoals het Gyakuten Project juist zaak dat individuen nieuwe gezamenlijke processen en mechanismen voor samenwerking ontwikkelen. Tegelijkertijd moeten ze ook aan de eisen van hun respectieve moederorganisaties voldoen. In dit hoofdstuk bestudeer ik daarom hoe grenzenwerk een rol speelt in het balanceren van project- en organisatorische eisen voor coördinatie. Hierbij stel ik de vraag: "Hoe nemen individuen in organisaties deel aan grenzenwerk voor het coördineren van werkactiviteiten in een complexe samenwerking tussen meerdere partijen?" Het antwoord op deze vraag hangt af van hoe partijen een afweging maken tussen de eisen van het project en die van hun organisatie. Ik ontdekte dat, afhankelijk van de ontwikkelde interesses gedurende het project, de partijen onderling grenzen kunnen openstellen (opening-up boundaries) ofwel nieuwe grenzen kunnen creëren (creating boundaries). Wanneer de interesses van het project samengaan met die van hun organisatie kunnen partijen onderlinge grenzen openstellen. Dit maakt het mogelijk om frequent en intensief te communiceren, hetgeen de ontwikkeling van coördinatiemechanismen voor een soepele uitvoering van het werk bevordert. Echter, wanneer er grote druk staat op het project kunnen partijen ook prioriteit gaan geven aan de eisen van hun organisatie en juist (nieuwe) grenzen creëren in relatie tot andere partijen. Dit belemmert frequente en intensieve communicatie en geeft ruimte aan partijen om zelfstandig hun werk te gaan coördineren. In het Gyakuten Project werden de Chinese en Japanse ingenieurs gescheiden door meerdere grenzen. Toch vonden ze een manier om hun werk over deze grenzen heen succesvol te coördineren. Hoewel de relatie tussen Nederlandse en Belgische ingenieurs werd gekenmerkt door minder grenzen, slaagden zij er opmerkelijk genoeg niet in om gezamenlijk hun werk te coördineren en de projectdoelstellingen op tijd te behalen. Ik bespreek de implicaties van deze resultaten voor literatuur over emergente coördinatieprocessen (emergent coordination processes) en grenzenwerk (boundary work).

Hoofdstuk Zes richt zich op de derde sub-casus: een radicaal innovatieproject, genaamd "Project Hogo". Bij dit project waren onder andere wetenschappelijke onderzoekers, technologen en fabrieksarbeiders uit Japan en Nederland betrokken. Theorieontwikkeling in dit hoofdstuk is gericht op de relatie tussen grenzenwerk en kennisdelingsprocessen. Wat we al weten is dat kennis veelal is ingebed in specifieke werkpraktijken, en dat het gebruik van gedeelde objecten en werkpraktijken het delen van kennis kan faciliteren. Echter, wat we nog niet weten is hoe nieuwe kennis die is ontwikkeld in een grensoverschrijdende setting kan worden gedeeld met anderen tijdens de implementatiefase van een project. In dit hoofdstuk bestudeer ik hoe individuen die betrokken waren bij Project Hogo deelnamen in grenzenwerk om het product Exomin, een radicaal nieuwe innovatie, te implementeren. Om kennis met technologen en arbeiders in de fabriek te kunnen delen, was het belangrijk voor Hogo-leden dat er voldoende continuïteit was in de werkpraktijken waarin hun kennis was ingebed. Tegelijkertijd ervoeren Hogo-leden de druk om hun werkpraktijken aan te passen, om zo te voldoen aan de normen en eisen die golden in de fabriek. Ik stel daartoe de volgende onderzoeksvraag: "Hoe beïnvloedt het grenzenwerk van innovatieontwikkelaars en -gebruikers hun vermogen om kennis te delen tijdens de implementatiefase?" Het antwoord op deze vraag ligt in hoe individuen een balans vinden tussen enerzijds de druk om genoeg gedeelde context te behouden (door continuïteit in werkpraktijken) om kennis te delen en anderzijds het aanpassen van werkpraktijken om te voldoen aan de eisen van de implementatiecontext. Indien er voldoende continuïteit van werkpraktijken is om nieuwe teamleden in te werken, kan het openstellen van grenzen (opening-up boundaries) onderlinge kennisdeling bevorderen. Het delen van kennis is echter minder succesvol wanneer er een substantiële verandering is in teamsamenstelling, en er onvoldoende tijd is om nieuwe leden in te werken. In dit geval zullen nieuwkomers bestaande grenzen willen behouden (maintaining boundaries) zodat ze kunnen blijven werken volgens bestaande normen en eisen van de implementatiecontext, wat op zijn beurt kennisdeling belemmert. Dit verklaart waarom de leden van Project Hogo succesvol waren in de initiële implementatie van Exomin, maar qua tijdsplanning en middelen in de problemen raakten tijdens de implementatie van Exomin in een grootschalige productiefaciliteit. Ik bespreek de implicaties van deze resultaten in het kader van literatuur over het implementeren van

innovaties (innovation implementation) en het proces van kennisdelen over grenzen heen (cross-boundary knowledge sharing).

Contributies. *Hoofdstuk Zeven* beschrijft de implicaties van bovenstaande resultaten voor Management- en Organisatietheorie en -praktijk. Ik ontdekte dat bedrijven grensoverschrijdende samenwerkingen organiseren voor de uitvoering van kennisintensief werk, variërend van strategieontwikkeling, technische ontwerpwerkzaamheden, tot het ontwikkelen en realiseren van technologische innovaties. Professionals die betrokken zijn bij dergelijke projecten kunnen tijdens de ontwikkeling van gedeelde werkprocessen onderlinge grenzen openstellen of veranderen, om zo gezamenlijk de werkzaamheden uit te kunnen voeren. Echter, individuen kunnen ook overgaan tot het creëren of behouden van grenzen, bijvoorbeeld wanneer ze hun autonomie willen behouden of willen blijven werken volgens vertrouwde werkprocessen. Deze resultaten complementeren bestaande literatuur over *samenwerking* (collaboration). Ze demonstreren dat mensen van verschillende contexten aandacht dienen te hebben voor onderlinge grenzen, om zo het ontwikkelen van gedeelde werkpraktijken mogelijk te maken. Dit gegeven conceptualiseer ik als "grenzenwerk". Dit proefschrift is ook een aanvulling op de veel gebruikte logica van cultuur als verklaring voor de processen, moeilijkheden en uitkomsten van samenwerken tussen meerdere landen en culturen. Ik pleit voor een verdere zoektocht naar wat we eigenlijk bedoelen wanneer we het hebben over cultuur. Ook dienen onderzoekers en professionals open te staan voor andere perspectieven om grenzen tussen groepen te definiëren en te verklaren. Verder draagt dit proefschrift bij aan bestaande literatuur rond grensdynamieken (boundary dynamics), door aandacht te vestigen op de sociaal-symbolische processen rondom grenzen en hoe individuen onderlinge grenzen ervaren, onderhandelen en (her-)configureren. Ik beargumenteer dat afhankelijk van de context, individuen (hetzij bewust of onbewust) andere verschillen inzetten om een grens te markeren. Dit hangt bijvoorbeeld af van hoe zij de situatie interpreteren, welke belangen op het spel staan, en hun vermogen om van vaststaande normen en werkpraktijken af te wijken. Door hier aandacht aan te besteden, breng ik de conceptualisatie van grenzenwerk in organisaties een stapje verder.

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