Boundary Work

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CHAPTER 3 | THE STUDY

3.1 Introduction of research approach and design

To develop theory about how organizational actors enact boundary work to realize knowledge-intensive work in cross-boundary collaboration calls for a close examination of the everyday work practices of involved actors and how they evolve over time, thus requiring a *process approach*. I followed an abductive research approach (Mantere and Ketokivi, 2013, p. 83) and undertook an in-depth longitudinal field study (Pettigrew, 1990) of the Japanese multinational "Mirai Corporation" – and its collaboration with the American engineering contractor "Ancone" for one of its engineering projects.

Guided by my theoretical framework and combined with the high level of site access that would be provided, I selected the multinational organization (MNC) as an appropriate empirical context for my research. For MNCs, access to specialized yet widely distributed knowledge has become essential to secure their financial growth and competitiveness in the digital age. Especially technology-driven MNCs derive part of their competitive advantage from their ability to access, integrate, and coordinate the highly specialized knowledge of their members. Cross-boundary collaborations among actors from different locations across the world are therefore crucial. For instance, alongside vertical headquarter-subsidiary collaborations, MNCs are experimenting with horizontal collaborations between different divisions or subsidiaries (Gnyawali et al., 2009). Such collaborations take place at strategic locations where the sharing and integration of specialized expertise is central to accomplishing work tasks (Boh et al., 2007; Boussebaa et al., 2014). As such, MNCs represent an empirical context where multiple manifestations of cross-boundary collaboration to accomplish knowledge-intensive work are likely to take place.

Furthermore, the MNC comprises a particularly relevant context for studying collaboration across multiple overlapping contexts. It represents a complex institutional setting (Värlander et al., 2016) with actors being embedded in multiple practice contexts (or fields; e.g., Phillips and Tracey, 2009, p. 170; Scott, 2014, p. 224). Cross-boundary collaborations in MNCs are likely to differ from conventional collaborations, as they often take place across multiple overlapping contexts (national, cultural, organizational, industrial). With people's work activities being guided by divergent norms, rules, and routines, this highlights the importance of an organizational competence in boundary spanning, (Orlikowski, 2002), for instance to manage global technology projects,

implement innovations, or to engage in open strategy making. Yet, as I argue in this thesis (see Chapter *One*), collaborating across boundaries also changes those very boundaries. This makes cross-boundary collaboration in MNCs a fruitful context to closely observe how organizational actors perceive and negotiate boundaries through their boundary work.

My research approach was abductive and aimed at theory development (Eisenhardt, 1989; Locke et al., 2008; Mantere and Ketokivi, 2013, p. 83). The design can be described along three characteristics. First, the study is *longitudinal* in character, spanning a four-year period. I adopted a process research design to capture the micro-processes of boundary work and how they affect the execution of knowledge-intensive work tasks in cross-boundary collaboration. Process thinking involves "considering phenomena dynamically – in terms of movement, activity, events, change and temporal evolution" (Langley 2007, p. 271), to explain *how* and *why* they emerge, develop, and change over time (Langley et al., 2013, p. 1; Van de Ven and Poole 1995, p. 512). It allows analysis of organizing processes, and the tracing of events, actors, artifacts, and their interrelationships (Garud et al., 2013). In Chapter *Two*, I conceptualized boundary work as a form of socio-symbolic work enacted in the everyday interactions among organizational actors. A prolonged and deep engagement in the field (Langley et al., 2013, p. 6) allowed me to develop a fine-grained understanding of the micro-level processes that comprise boundary work. My fieldwork consisted of two rounds of data collection, spanning a four-year period. During the first period (2009-2010), I conducted twelve months of field research at the Japanese multinational "Mirai Corporation". In the second period (2012-2013), I returned to Mirai Corporation to collect data for another twelve months. That period, I also gained access to the American engineering contractor Ancone, to study their collaboration with Mirai Corporation in the Gyakuten project. The longitudinal character of my study, with two extensive periods of data collection, allowed me to examine the growth, evolution, and transformation of organizational actors' boundary work over time, and how it affected the knowledge-intensive work that was executed in the cross-boundary collaborations studied (Pettigrew, 1990, p. 285; Yin, 2015, p. 53).

Second, I made repeated visits to multiple research sites to include all actors that were involved in the collaborations studied. I collected data at nine sites of Mirai Corporation in Europe and Japan, and at three sites of Ancone in Europe and China. This allowed me to observe how work tasks were carried out collaboratively in cross-boundary settings.

Third, I adopted an embedded case study design (Yin, 2015). Case study research primarily focuses on understanding the dynamics within cases and provides an opportunity for theory development about the underlying mechanisms (Eisenhardt, 1989; Eisenhardt and Graebner, 2007). In an embedded case study, data collection is focused on different sub-cases that are embedded within the overall case study. Within Mirai Corporation, overall data collection focused on:

(1) One multiparty engineering project (the "Gyakuten Project");
(2) Two innovation projects (one of which was "Project Hogo");
(3) One middle management project; and
(4) One senior management collaboration (Mirai Technologies' divisional management team).

The careful consideration of multiple cross-boundary collaborations within the broader context of the MNC seemed to be the best way for me to clarify and enlarge the body of thought about boundary work in contemporary organizing. Studying multiple embedded sub-cases allowed me to better understand the mechanisms that explained similarities and differences between cases in terms of how actors' boundary work was related to the execution of knowledge-intensive work. Hence, the research design facilitated a fine-grained understanding of a case and providing rich opportunities for theory development around boundary work in contemporary organizing. In the remainder of this Chapter I will describe the research sites (3.2) data collection and analysis (3.3), and the limitations of my research approach (3.4).

3.2 Research sites

3.2.1 Mirai Corporation

Mirai Corporation (henceforth *MCorp*) is a global, technology-driven MNC from Japan, ranked in the Forbes global 2000 index and listed on the Tokyo and Osaka stock exchange. MCorp's headquarters and most of its subsidiaries are located in Japan, with others located in Asia, the United States, and Europe. Like many Japanese MNCs, it operates in different industries, manufacturing products based on technological innovation. At the start of the study (September 2009), MCorp employed approximately 20,000 people across ten business divisions. "Mirai Technologies" is one division of MCorp and "Mirai Engineering Japan" is another one (see Figure 3.1). Mirai Engineering Japan (henceforth *MirenJP*) is the engineering division of MCorp that assists other divisions and group companies in

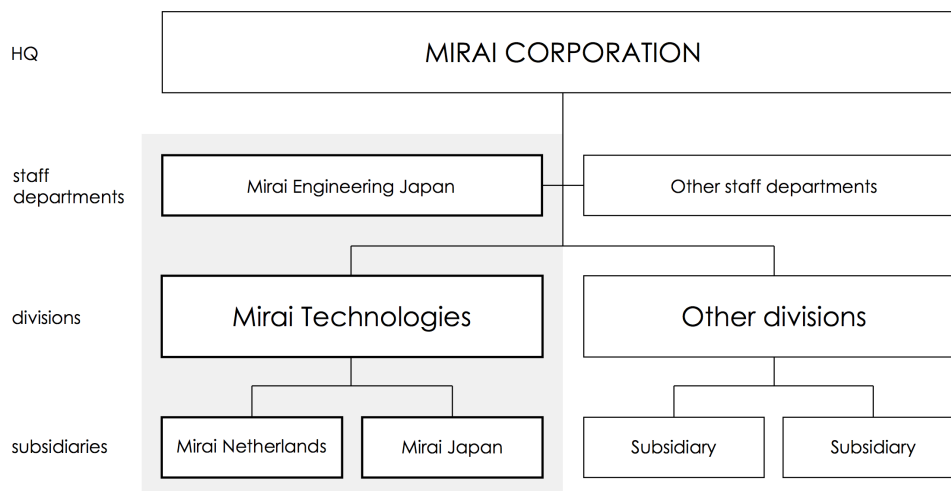engineering work and production technology, such as in the Gyakuten Project.

FIGURE 3.1 | Organizational chart of Mirai Corporation

One strategic dilemma that MCorp faced was how to secure sustainable growth and global excellence. Therefore, from the late 20th century onwards, MCorp had started to acquire several overseas subsidiaries in other parts of Asia, the United States, and Europe. One acquisition concerned "Mirai Netherlands", which after the introduction of a holding structure became part of Mirai Technologies (henceforth *MTech*). MTech is a core business division of MCorp and a key player in its main industries, providing high quality semi-manufactured materials. The two principal subsidiaries of MTech are "Mirai Japan" (henceforth *MiraiJP*), and Mirai Netherlands (henceforth *MiraiNL*). At the start of the research, MTech employed approximately 2,000 employees that worked in a dozen group companies, located in Japan, Europe, North and South America, and China. The acquisition of MiraiNL was part of MCorp's strategy to strengthen the position of its technology division. The acquisition provided MTech access to highly specialized expertise and increased production capacity, as well as contributing to the globalization and diversification of its various businesses. Following the acquisition, MiraiNL fulfilled a unique position within MCorp more generally: as an overseas subsidiary, it could operate relatively independently from Japan and had a remarkably large research institute.

3.2.2 Gaining access

I first contacted MCorp in the fall of 2008. An acquaintance put me in touch with *Walter*, the human resources director of MiraiNL, who provided me with access. Walter was in his mid-

fifties and had extensive working experience in Asia and Europe. He was part of MiraiNL's top-management team as well as MCorp's global human resources team. It was during my first meeting with Walter in early 2009, that I learned how well suited MCorp was for my study. Walter explained his close collaboration with Japanese colleagues at the headquarters and at MiraiJP. While being positive about MiraiNL's acquisition by MCorp, he described his relation with Japanese colleagues as "quite complex" due to the many differences in the way of working of Japanese and European parts of the organization.

MCorp and MTech expressed interest in my research proposal and the opportunity for self-reflection it offered them. With sales returns rapidly declining in 2009, the effects of the global financial crisis were becoming clearly visible. To secure its leading market position in MTech's industries, MCorp urged MiraiJP and MiraiNL senior managers to increase the efficiency and profitability of their operations through closer collaboration. It requested the formation of a divisional management team to facilitate strategic decision-making at a divisional level. Furthermore, anticipating the decline in sales would only be temporary, MCorp also encouraged collaboration at lower organizational levels around the development of new production technologies and innovative products, and to expand production facilities for MTech products in emerging markets, such as Asia. However, to leverage synergies and opportunities for innovation and knowledge integration through such cross-boundary collaboration, required organizational actors to sort out the many differences between them. MCorp tried to address these differences, for instance by asking MTech managers to develop a more "*global*" way of working. In past years, it had also started experimentation with collaborations between its MiraiJP and MiraiNL subsidiaries, for instance by initiating several so-called "global projects" between their respective research centers. Both MCorp and MTech wanted to learn from my observations and data analysis, which I would report to them upon completion of the thesis.

To understand and document the micro-processes through which MTech members involved in these cross-boundary collaborations dealt with the multiplicity of differences (e.g., in terms of their cultures, knowledge, language and practices) between them to develop a competence in collaborative boundary spanning, I studied MTech's divisional management collaboration as well as the collaborations initiated in the areas of middle management (a Dutch-Japanese management training program), research (projects "*Hogo"* and "*Zeni"*), and engineering (the "*Gyakuten*" project). When I returned to the research site

for a second round of data collection in 2012, I was also provided access to study the "Gyakuten" project, for which collaboration was sought with the American engineering contractor "Ancone". I gained access to Ancone through an introduction by Patrick, the Dutch project leader of Gyakuten. It turned out that Ancone was also interested in the learning and self-reflection that my study of Gyakuten offered them and was open to participate in my research.

3.2.3 Cross-boundary collaboration at MCorp

I started the research by identifying those sites where cross-boundary collaborations were initiated. At the time, the five sub-cases of collaboration I studied were the only instances of focused and substantive collaboration between MiraiNL and other parts of MCorp. They involved senior and middle managers, research scientists, and engineers. Judged by their richness, impact on the organization, and potential for theory development, I selected three sub-cases for inclusion in this thesis: MTech's divisional management collaboration, the Gyakuten Project, and Project Hogo. Whereas Project Hogo and MTech's divisional management team are both instances of intra-organizational collaboration, the Gyakuten Project represents a complex case of both inter- and intra-organizational collaboration. Also, MCorp members identified these instances of cross-boundary collaboration as the most interesting and impactful ones within MCorp. Namely, they all took place within MTech – MCorp's most globalized business division – and involve intensive interaction among European and Japanese members over a substantial period of time. The selected collaborations all concerned knowledge-intensive work that is important to many technological MNCs: strategy making, engineering design work, and radical innovation. While they are described in more detail in Chapter 4-6, I will briefly describe these three embedded sub-cases here.

MTech's divisional management team (Ch. 4) was an open strategy initiative involving MiraiJP and MiraiNL senior managers. In view of their similarities in terms of products and markets, MCorp asked MiraiJP and MiraiNL managers to form a divisional management team with a global way of working so they could engage in integrated strategy making at the divisional level. This change marked a critical turn in both subsidiaries' histories. Figure 3.2 visualizes the organizational structure of MTech's divisional management.
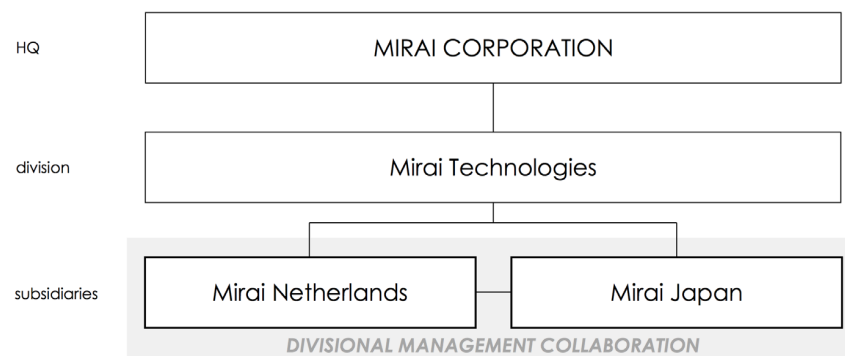
FIGURE 3.2 | Organizational chart of MTech's divisional management collaboration

One empirical dilemma that MiraiJP and MiraiNL managers encountered was *how to form a divisional management team with a joint approach to strategy making.* Producing similar products and operating in the same market, MiraiJP and MiraiNL managers both saw the benefits of integrating their strategy making processes. However, in the process of becoming a divisional management team and integrating their strategy processes, creating sufficient common ground to collaborate around realizing integrated strategy making proved not that easy. In fact, I observed that actors' boundary work towards realizing integrated strategy making actually prevented their strategy processes to become truly integrated. This highly politicized context of strategy making among MTech divisional managers thus presented me with an interesting research setting to further theory development about the relation between boundary work and (integrated) strategy making in horizontal MNC-collaborations. To this aim, I asked the question: *How do strategic actors make sense of and enact boundaries to create common ground for open strategy making?* (SQ1)

The *Gyakuten Project* (Ch. 5) was a multiparty engineering project involving four groups of engineers from Japan, China, Belgium, and the Netherlands. MCorp had initiated Gyakuten to start the engineering design work for a new production facility for MiraiNL that was to be built in China. It represents a complex case of both *inter-* and *intra*-organizational collaboration. On the part of MCorp, Dutch and Japanese engineers from MiraiNL and MirenJP were involved. For the engineering design work, MCorp sought collaboration with the American engineering contractor Ancone, a Fortune 500 company that is listed on the New York stock exchange. Ancone was founded around 1950 as a one-man firm, and gradually evolved into an engineering company with worldwide affiliations. This international presence, such as in Asia and Europe, allows Ancone to work closely together with its various clients. At the time of the research (May 2012), Ancone employed

approximately 70,000 people in more than 200 offices. In the past, the European-based affiliate of Ancone had supported MiraiNL in engineering projects and, as such, was familiar with its production technology. For the Gyakuten project, MCorp collaborated with two subsidiaries of Ancone: "Ancone Belgium" (henceforth *AnconeBE*) and "Ancone China" (henceforth *AnconeCN*). Figure 3.3 provides an organizational chart of the Gyakuten project.
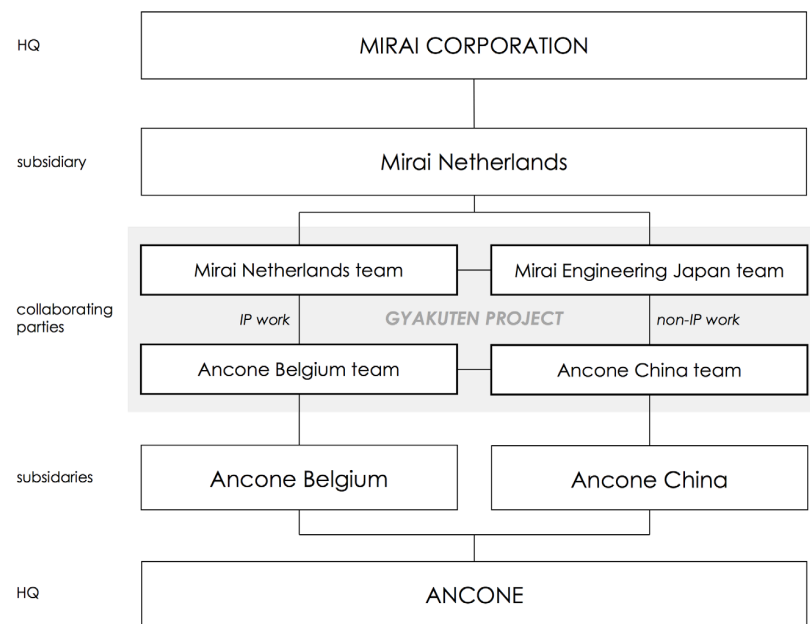

FIGURE 3.3 | Organizational chart of the Gyakuten Project

One empirical dilemma encountered by collaborating parties in Gyakuten was *how to coordinate their work tasks across multiple collaborative relations*. The execution of knowledge-intensive work becomes more complex when it is carried out in multiple collaborative relations, thereby posing coordination challenges. The timely realization of project objectives requires collaborating parties to develop shared coordination practices while also complying with those of their respective parent organizations. However, I observed how in one collaborative relation the boundary work enacted by collaborating parties to coordinate their work resulted in the timely realization of project objectives, but resulted in substantial delays in another. This setting, where coordination processes were needed that satisfied both project and organizational requirements for coordination, thus presented me an interesting context to further theory development about the relation between boundary work and (emergent) coordination in complex engineering projects. To this aim, I asked the question: *How do collaborating parties enact boundary work to coordinate work tasks in complex multiparty collaboration?* (SQ2)

Project Hogo (Ch. 6) was a radical technological innovation project involving research scientists, engineers, and operators from MiraiJP and MiraiNL. This innovation project started as a small research project that was initiated by MCorp to explore new avenues for expanding MCorp's product portfolio towards more sustainable and environmentally friendly products. To this aim, researchers and engineers from MiraiJP and MiraiNL collaborated for several years across multiple locations to jointly develop the new material "Exomin" and its related production technology. With successful achievement of intermediate results, the project expanded over time and eventually led to the development of a new large-scale production facility with around 50 employees. Figure 3.4 provides an overview of the different locations that were involved at different stages of the project.

FIGURE 3.4 | Organizational chart of Project Hogo

One empirical dilemma that research scientists encountered during Exomin's implementation process was *how to share their innovation knowledge with engineers and operators who were responsible for producing Exomin in the plant.* I observed that, despite having developed and successfully implemented Exomin internally and on a small scale, Hogo members nevertheless ran into trouble when subsequently implementing Exomin for large-scale production. This context, where successful innovation implementation required substantial boundary work, presented me with an interesting research setting to study the relationship between boundary work and the implementation of radical technological innovations. To this aim I asked the question: *"How does the boundary work of innovators and adopters shape their ability to share knowledge during innovation implementation?"* (SQ3)

3.2.4 Relevance of sites for studying RQ

Mirai Corporation provided me extensive access for my research. I highlight two reasons why this context offers rich opportunities for theory development on how organizational actors' boundary work affects the execution of knowledge-intensive work in cross-boundary collaboration. First, it was only recently that MCorp had started to initiate collaborative projects with MiraiNL. Following the success of such cross-boundary collaborations to execute knowledge-intensive work in the areas of technology and innovation, it now also experimented with initiating cross-boundary collaboration in the area of strategy making. The changes in work processes that accompanied the initiation of cross-boundary collaboration, together with a greater instability of the external environment, made MCorp a relevant site for the study of boundary work (Epstein, 1992, p. 232; Zerubavel, 1991, p. 55).

Second, despite the considerable economic success in the past, few studies in Management and Organization today are based on qualitative studies of Japanese firms (see Hong and Snell, 2013; Neeley and Dumas, 2016; Noorderhaven et al., 2007 for notable exceptions). Empirical studies of Japanese firms have made important contributions to Organization and Management theory in the 70s, 80s, and 90s, for instance related to long-range planning (Kono, 1976), lifetime employment (Ouchi, 1982), kaizen continuous improvement (Imai 1986), the Toyota production system (Shingo, 1981) and knowledge management (Nonaka and Takeuchi, 1995). It appeared to me that, with its history of adopting business models in which firms rely extensively on the long-term relations with suppliers, Japanese firms may also form a relevant empirical context for the study of cross-boundary collaboration. Especially in Japanese MNCs, and considering the apparent differences in terms of cultural, managerial, and organizational practices between Japan and other regions in the world, the boundaries that affect the realization of knowledge-intensive work tasks that are jointly executed across settings should be "transparently observable" (Pettigrew, 1990, p. 275). The potential variety, intensity, and multiplicity of boundaries made me believe that studying and documenting the processes around them in a Japanese MNC could bring the dynamics of boundary work into sharper focus. This allows to develop theoretical insight (Eisenhardt, 1989) on organizing knowledge-intensive work in cross-boundary settings that can help to address one of the biggest challenges of contemporary organizations.

3.3 Data collection and analysis

3.3.1 Data collection process

Data collection was based on retrospective as well as real-time longitudinal data collection during two extended fieldwork periods. I conducted twelve months of fieldwork from September 2009 through September 2010 (with follow-up sessions conducted until March 2011), and returned for another twelve months of data collection from May 2012 through May 2013. With Amsterdam being my home base, I made repeated research visits to nine sites of MCorp that were located in Japan, the Netherlands and Germany, and three research sites of Ancone in China, Belgium, and the Netherlands (see Figure 3.5 below). Real-time longitudinal data, collected through interviews, observations, and documents, allowed me to take the actors' perspectives into account and to compare how they evolved over time. Retrospective data from interviews and archival data, in turn, allowed me to study longer time periods, including the time periods before and in-between my real-time data collection. Table 1.1 in the Introduction provides further details about the different sources of data I collected and used in this thesis. I now continue with a summarized discussion of the data collection methods. Further, details about their application can be found in the 'Methods' sections of Chapters 4-6.

3.3.2 Methods of data collection

Observations. Through participant observation at the different research sites, I studied (1) the design of the different collaborations, (2) which actors were involved, (3) the actual practices through which collaborative work tasks were executed over time, (4) the boundaries that became manifest in actors' everyday work activities, and (5) how actors coped with them through their boundary work. To this aim, I spent an estimated 760 hours at MTech's management departments, research labs, pilot plants, and production sites. For instance, for Project Hogo, I observed daily work activities, as well as audit meetings, videoconferences, and team meetings. I visited the different research institutes and production sites, to get a feel for the products that were developed, and to meet the people that were working there. I also observed more informal settings such as coffee breaks, lunch breaks, and after-work drinks. Together, this provided a sense of research participants' everyday work lives, the actual practices that comprised cross-boundary collaboration at

MCorp, and the boundary work enacted by involved actors. Observations were documented with field notes for further analysis.
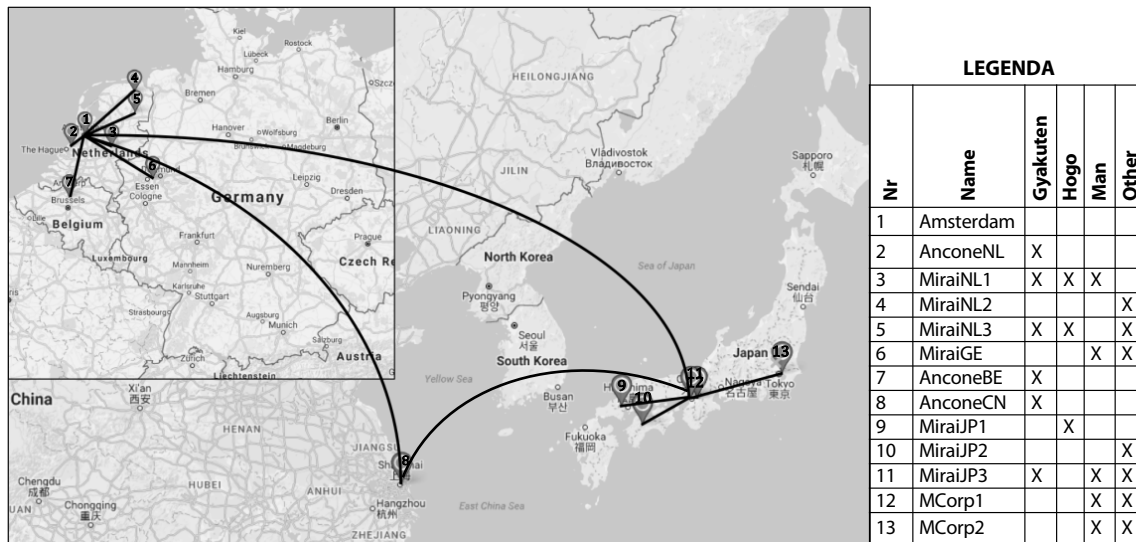

Nr	Name	Gyakuten	Hogo	Man	Other
1	Amsterdam				
2	AnconeNL	X			
3	MiraiNL1	X	X	X	
4	MiraiNL2				X
5	MiraiNL3	X	X		X
6	MiraiGE			X	X
7	AnconeBE	X			
8	AnconeCN	X			
9	MiraiJP1		X		
10	MiraiJP2				X
11	MiraiJP3	X		X	X
12	MCorp1			X	X
13	MCorp2			X	X

FIGURE 3.5 | Overview of research sites

Interviews. I held semi-structured interviews with research scientists, engineers, middle managers, and executive managers at divisional and top-management levels. Interviews are a suitable method to inductively study boundaries, their permeability and relative importance between national and group contexts (Lamont, 1992; Lamont and Molnar, 2002, p. 173), and organizational actors' boundary work. Interviewees were selected on the basis of their involvement in the different sub-cases. This resulted in a total of 114 interviews, of which 50 were held during the first fieldwork period and 64 during the second one. The interview protocols used during the two fieldwork periods are included in the attachment. whereas the same protocols were used for all interviews during a fieldwork period, they were flexibly used to guide the interview. This allowed me to closely follow interviewees' own stories and experiences. Hence, while the interviews had a similar starting point (usually asking interviewees to tell me something about themselves and what they were working on), they usually went in different directions (for instance when describing how they addressed boundaries in their collaboration). Interviews were fully transcribed for further analysis and shared with interviewees for a member check.

Documents and archival data. I analyzed a substantial number of documents such as company reports, archival data, press accounts, and project reports. These documents provided information about (1) the history of the organizations (2) the design of the

collaborations studied, (3) their objectives, and (4) their outcomes. Analyzing these documents provided the context necessary to interpret interview and observation data. They also provided insight into planned work practices that were to be carried out in the collaborations studied, as well as their outcomes. Hence, combining different methods of data collection allowed me to examine actors' individual and collective interpretations of events, provided an in-depth and contextually embedded understanding of the subject matter, as well as a comparison with actual reported outcomes.

3.3.3 Data analysis

To develop theory around the central research question of how organizational actors enacted boundary work to execute knowledge-intensive work in cross-boundary collaboration. Following common practice in qualitative process research, I combined open coding (Strauss and Corbin, 1990) with temporal bracketing (Langley, 1990) to compare and contrast embedded units of analysis (Eisenhardt, 1989). For this I made use of various tables and figures (Miles and Huberman, 2014). In broad terms, data analysis in the three empirical studies of cross-boundary collaboration focused on three objectives. First, I identified the boundaries that became salient when collaborating around specific types of knowledge-intensive work. Second, I identified the forms of boundary work that that participants enacted. Third, I analyzed how participants' boundary work variously impacted the achievement of knowledge-intensive work tasks around complex engineering design work, the implementation of a radical technological innovation, and strategy making.

The analysis of longitudinal process data can be characterized as an iterative process of moving back and forth between the empirical material and its theoretical reading (Alvesson and Karreman, 2007). For each study, the start of empirical analysis was formed by my interest in understanding the biggest empirical puzzle that I encountered during data collection, and as described in section 3.2.3. To this aim, I first traced events (Poole et al., 2000; Van de Ven and Poole, 2005) through a chronological ordering of independent events. I developed case narratives and visually mapped key events in the different collaborations observed. Then, through temporal bracketing (Langley, 1999), I distinguished different phases in the cases that represent comparative units of analysis within the longitudinal data. This allowed for within-case comparison (Poole et al., 2000) and the identification of explanatory mechanisms (Tsoukas, 1989; Van de Ven, 1992;

Langley et al., 2013, p. 7).

Building upon insights from grounded theory (Strauss and Corbin, 1998), and assisted by analytical software such as Atlas.ti and NVivo, I subsequently started in-depth coding of the empirical material. First-order analysis of the empirical material was inductive and centered around (1) the activities that describe 'what people do' (Feldman and Orlikowski, 2011), (2) the actors and locations involved in these activities, (3) the tools and technologies used, and (4) related meanings and interpretations. Constant comparison of emerging codes with the literature allowed me to identify patterns in the data and to gradually develop second-order theoretical themes. I then moved towards a more abductive mode of coding (Locke et al., 2008; Mantere and Ketokivi, 2013), in which I isolated theoretical themes and aggregated dimensions.

Finally, I analyzed the relations between different codes and themes, leading to visual representations of observed collaboration dynamics (Langley et al., 2013, p. 8). By explaining how collaboration activities and interactions across groups of actors and contexts contributed to both stability and change (Langley et al., 2013, p. 110), my analysis develops theoretical explanations about the how and why behind these changes (Van de Ven and Poole, 1995, p. 512). Such explanations identify the generative mechanisms that cause observed events to happen and their particular circumstances (Harre and Madden, 1975; Tsoukas, 1989; Van de Ven and Poole, 1995, p. 512). Table 3.1 provides an overview of each study's research question, central concepts, and the focus of analysis. More detailed descriptions of the data analysis process of each of the empirical studies are provided in the 'Methods' sections of Chapter 4-6.

3.4 Limitations of the study

One limitation of the research approach of this thesis is that findings are derived from the analysis of three sub-cases, all carried out within the context of a single organization as it started to experiment with cross-boundary collaboration. This was a conscious choice in the study's research design. The in-depth studies encouraged me to attend to individuality, complexity, and variety as a basis for theory development (Starbuck, 2005), and which contextualized outcomes in other settings can serve as the basis for ongoing action (Garud et al., 2013). Further, with its subsidiaries and divisions being embedded in two very different institutional settings and shared practices being initially absent, this may have

TABLE 3.1 | Overview research questions, data collection and analysis

Central concepts	Unit of analysis	Analytical focus	Outcome
SQ1. How do strategic actors make sense of and enact boundaries to create common ground for open strategy making?			
Boundary work Common ground Sensemaking Open strategy	Processes and practices within an open strategy initiative at MTech, involving senior managers from MiraiJP and MiraiNL	Strategic reporting Managerial changes Interpreting and negotiating boundaries Integrated strategy making	Theoretical framework of the relation between boundary work and creating common ground for open strategy making
SQ2. How do organizational actors enact boundary work to coordinate their work tasks in complex multiparty collaboration?			
Boundary work Coordination Relational complexity	Processes and practices within the multiparty engineering project *Gyakuten,* involving engineers from MirenJP, AnconeCN, AnconeBE, and MiraiNL	Collaborative relations Scope changes Negotiating boundaries Emergent coordination practices	Theoretical framework of the relation between boundary work and coordination in multiparty collaboration
SQ3. How does the boundary work of innovators and adopters affect their ability to share knowledge during innovation implementation?			
Boundary work Innovation implementation Knowledge sharing	Processes and practices within the radical technological innovation project *Hogo,* involving research scientists, engineers, and operators from MiraiJP and MiraiNL	Relations among professional groups Transition moments Negotiating boundaries Knowledge sharing	Theoretical framework of the relation between boundary work and knowledge sharing during innovation implementation

made boundaries more pronounced. I expect to observe similar mechanisms in other organizations, yet the generality of the findings – whether the types of boundary work identified in this thesis can also be found in other organizational contexts – remains open for further investigation. Future research can for instance focus on more established forms of cross-boundary collaboration, for instance taking place in ecosystems, or even more short-term ones, such as facilitated by platforms that are part of the service economy. Another interesting question is whether my findings also hold in even more complex organizational settings such as large-scale collaborations that involve multiple stakeholders (e.g., around sustainability and environmental issues), or revolve around knowledge-intensive work tasks that are carried out across expertise domains in open innovation or crowdsourcing projects. How does boundary work affect the way knowledge-intensive work in these organizational contexts is executed and how does it evolve over time?

Another limitation of this thesis is the specificity of the research context in which I studied cross-boundary collaboration: a technology-based MNC from Japan. As an organization. MCorp had a long history and its MTech division operated in a very traditional

production industry. In this respect, it would be interesting to know whether similar patterns are found in studies of cross-boundary collaboration in different industries. Furthermore, I conducted the research in a period that MCorp was hit hard by the global financial crisis. This macro-level factor might have made the boundary work dynamics I observed more extreme.

During the research, I also had to make various methodological tradeoffs, such as the amount of time spent at the various locations and on studying the different sub-cases. I will highlight two challenging aspects of my fieldwork. First, the limited amount of documentary data on MCorp's institutional context; such data could provide a more accurate picture of the MCorp organization at large. Since this data was in Japanese, my limited understanding of the Japanese language made it impossible for me to include such data in my analysis. Second, and related to this, all interviews with Japanese and Chinese participants were conducted in English. The language issue worried me during fieldwork preparation since interviewing participants would probably reveal more detailed insight when they were interviewed in their native language. As a preparation for my fieldwork, I therefore followed a beginner's course in Japanese and also read about other researchers' experiences of conducting interviews in a second language (e.g., Marschan-Piekkari and Reis, 2004). While recognizing this as a methodological limitation of my research, I believe it was less of a problem than initially anticipated. English was MTech's official working language and constituted the shared language for the collaborations I studied. Throughout my fieldwork I also developed several practices that helped me to at least partially overcome the language issue. I often adjusted my language use when talking with Japanese research participants. For instance, during interviews I developed a practice of adopting interviewees' word choices as much as possible, so as to stay close to their experiencse and ways of expressing it. Further, there were many times that I decided to remain silent for a period of time after having asked a question – sometimes more than ten minutes – to allow participants time to find the right words to tell their personal stories. Sometimes participants had to look up some words by means of a small translation device. In a few occasions, a translator was present to support meetings or interviews. Yet, I often preferred participants' own formulation of their stories – despite being in broken English – since translators tended to provide summarized translations of participants' original words, often leaving out aspects that were relevant to my research. Hence, while recognizing that this

research would have benefitted from a research team that included Japanese and Chinese-speaking researchers, I believe the way I addressed it did help to collect a rich and comprehensive dataset that can help further theory development.

A third methodological challenge of my research was the limited observational data on the actual boundary work enacted in the collaborations studied. The extensive amount of time I spent as a participant observer at MCorp provided an accurate picture of the contexts across which collaboration took place. But with my research taking place across different sites, it was not always possible for me to be in the right place at the right time and observe all boundary-spanning interactions. The limited availability of information technologies, such as videoconferencing, to facilitate such interactions formed another reason. Participants also indicated their preference for communicating work-related matters by email. Its virtual nature and confidentiality limited my ability to study such interactions with traditional ethnographic methods. Finally, even when I was able to observe boundary-spanning interactions, such as during videoconference and face-to-face meetings, their highly formalized nature and focus on discussing work outcomes rather than the actual work itself left me with the feeling that my observations were limited in the extent to which they described participants' boundary work. Therefore, my observations are limited to the extent they described participants' boundary work during such boundary-spanning interactions.

While recognizing this limitation, I believe my findings provide rich and novel insights about participants' boundary work, especially as described in detail in the interview data (see Lamont, 1992 and Lamont and Molnar, 2002 for a similar argument) and through their traces evident in project documentation. It might be that its socio-symbolic nature makes boundary work more a reflective matter – of the individual resolving conflicts in his or her own mind – that, while shared through people's sensemaking narratives, is less observable in concrete boundary-spanning interactions. After the interviews, research participants often approached me spontaneously to update me about their work, a meeting they just had, or just to have a quick chat about things that they thought might be relevant to my research. I view my observations as informative about the causes and consequences of boundary issues, and the interviews as helpful in revealing processes of boundary work. Future studies can build on these insights for analyzing boundary work in other contexts.