



UNIVERSITEIT TWENTE.



# **An innovative SME managing its asymmetrical inter-organizational relationships**

**a time perspective**

Master thesis

**Tamara Oukes**

Oktober 2013



**Title** **An innovative SME managing its asymmetrical inter-organizational relationships  
*a time perspective***

Place and date Apeldoorn, October 31<sup>th</sup> 2013

Author T. (Tamara) Oukes BSc.  
Student number s0198854  
E-mail t.oukes@student.utwente.nl

University University of Twente  
Program Business Administration  
Track Innovation and Entrepreneurship

University Technical University of Berlin  
Program Innovation Management and Entrepreneurship

Graduation committee Dr. A.M. von Raesfeld Meijer  
University of Twente  
Business Administration

MBA R.P.A. Loohuis  
University of Twente  
Business Administration

**Educational institutions**

University of Twente

Technical University of Berlin

**UNIVERSITEIT TWENTE.**





## Abstract

Innovation in small and medium-sized enterprises (SMEs) is important, because of its effects on their growth and the potential of the SME sector to act as catalyst of economic progress. SMEs can acquire the resources and capabilities that are necessary in their path from invention to innovation through partnerships. However, inter-organizational relationships (IORs) are difficult to initiate and sustain for SMEs due to the performance and relational risks involved. As the SME is often considered in a situation of dependence these risks are aggravated by the increasing asymmetry of relationships. Unfortunately the practical relevance of the existing research on this issue, so necessary for SME managers to enable them to overcome the barriers to successful innovation, is missing. The major part of the research is on the management of relationships from the perspective of the powerful partner at one static point in time, while studies on the organization of relationships from the perspective of the subordinate partner over time are needed. In response to a cry for guidance of an innovative SME looking for ways to handle the relationships with their powerful partners, in this thesis the tasks necessary to manage the asymmetrical relationships of a SME during their life-time are identified. For this purpose, the state-of-the-art literature in different areas was combined to develop a conceptual framework. The framework proposed that the SME's asymmetrical relationships follow a sequence of formation, operation, and outcome along with respectively initiation, exchange, and outcome tasks unfold. In order to empirically explore the validity of the model a process research approach was adopted. Specifically, the model was tested by comparing the management tasks executed in six asymmetrical inter-organizational relationships of an innovative SME over a period of nine years in retrospective and six months in real time. The necessary data was acquired via a combination of semi-structured interviews, passive observations, and archival data. Thereafter, two data analysis strategies – visual mapping and temporal bracketing – were used to capture the gathered data in all its richness. The findings illustrate that many of the tasks used by large, established organizations are also used by the SME to manage their asymmetrical relationships. However, due its size and characteristics the SME is limited in the execution of some of these tasks. In particular, the identification of partners based on their reputation, developing the capability to learn from partners, and monitoring if the activities are carried out according to plan appear to be difficult. In addition, it was demonstrated that the development of the tasks to manage the SME's asymmetrical relationships follows the development of the relationship itself. After the identification of the partner, the relationship developed along a iterative cycle of negotiation, agreement, and operation. Accordingly, the tasks executed develop from partner identification, to partner attraction and selection, to the formalization of agreements till the creation of informal communication mechanisms to manage and appropriate knowledge, conflict management and outcome, behavioral and social control. The drivers of the transition from one phase into the next were also considered. It was found that the perception of the performance and relational risks associated with the asymmetrical relationship were the main driver of change. During the relationship the risks should gradually drop to proceed to the next stage. During the operation phase, however, these risks may increase suddenly or the opportunity may arise to reduce them drastically. In this case, the partners have to rethink the terms of their relationship, and the relationship enters the negotiation phase again.

## Preface

Apeldoorn, October 2013

The last six months I had the pleasure to do scientific research for my masters Business Administration at the University of Twente and Innovation Management and Entrepreneurship at the Technical University of Berlin. During my bachelors I discovered how much I like to do research. In order to complete my bachelor degree I conducted a qualitative research project at a large manufacturer. However, I did not want do the same type of study again, because I have a great ambition to learn. Hence, I hoped to find a qualitative research project at small or medium-sized company. With the help of Ariane von Raesfeld's connections I was fortunate to be able to conduct a research project at an innovative small and medium-sized enterprise in the Eastern part of the Netherlands. The question from the business was how it could handle the large players with which it must cooperate to make its invention a success. My first thoughts were that there was already a lot of research done on this topic, but nothing was further from the truth. Formulating a question to the business question has certainly been a challenge, but along the journey the results have been interesting and I hoop this is reflected in the following thesis.

During the entire period of writing my master thesis I had a lot of support. As pointed out earlier, without the help of Ariane von Raesfeld I would probably not have got in touch with the business. In addition, her feedback and tips helped me a lot during the design of study and writing my thesis. The feedback from Raymond Loohuis, my second supervisor from Twente, was also warmly welcomed. Especially his tips on the research methodology helped me a lot. Moreover, the tips and tricks from Ingo Michelfelder, my supervisor from Berlin, were very valuable. He directed me to the focus of my research. My family, boyfriend and friends also deserve a note of credit here. During my time at the innovative business I have always felt welcome and the freedom of carrying out this project helped me with my personal and professional development to a great extent. Therefore, I want to thank all my colleagues there. Above all Robin Koops and Wim smit, the owners, for their insight and openness in the how and what of managing an innovation project in a small and medium-sized enterprise. Also, Helga Blauw deserves extra credit for carpooling with me every day in the first few months.

Tamara Oukes

## Table of contents

Abstract	I
Preface	II
Table of contents	III
List of figures	V
List of tables	VI
List of abbreviations	VII
1 Introduction	1
1.1 The managerial gap	1
1.2 The academic gap	1
1.3 Filling the managerial and academic gap	2
2 State-of-the-art literature	3
2.1 Innovation by SMEs important for business growth and economic progress	3
2.2 The benefits and barriers of innovative SMEs	3
2.3 Cooperation as a means to overcome the barriers of innovation for SMEs	4
2.4 Asymmetrical relationships increasingly common	5
2.5 Network management reduces the challenges of an SME's asymmetrical relationships	6
2.6 Relationship-specific management tasks change according to the relationship stage	7
2.7 Conclusion	10
3 Methodology	11
3.1 Temporal orientation	11
3.2 Unit of analysis	12
3.3 Sampling	12
3.4 Comparison across relationships and with theory	13
3.4.1 Comparison across relationships	13
3.4.2 Comparison with theory	16
3.5 Data sources	16
3.6 Data analysis	17
3.7 Conclusion	18
4 Findings	19
4.1 Presentation of the innovative SME, the innovation project, and the network	19
4.2 The identification phase	21
4.2.1 Relationship-specific tasks in the identification phase	21
4.2.2 Driver of change to the negotiation phase	21
4.3 The negotiation phase	22
4.3.1 Relationship-specific tasks in the negotiation phase	22
4.3.2 Driver of change to the agreement phase	23
4.4 The agreement phase	23
4.4.1 Relationship-specific tasks in the agreement phase	23
4.4.2 Driver of change to the operation phase	24
4.5 The operation phase	24
4.5.1 Relationship-specific tasks in the operation phase	24
4.5.2 Driver of change to the negotiation phase	26
4.6 Conclusion	27

5	Discussion	34
5.1	Comparison with the theory: the relationship-specific tasks	34
5.1.1	The findings compared to the literature: the initiation tasks	34
5.1.2	The findings compared to the literature: the exchange tasks	36
5.1.3	The findings compared to the literature: the coordination tasks	36
5.2	Comparison with the theory: the development of the relationship-specific tasks	37
5.3	Comparison across relationships	40
6	Conclusion	42
6.1	Theoretical contributions	42
6.2	Managerial implications	43
6.3	Research limitations	43
6.4	Future research	44
7	Bibliography	45
8	Appendices	53
8.1	SME definition by European Law	53
8.2	Types of inter-organizational relationships	53
8.3	Sources of the relationship-specific tasks	54
8.4	Appendix E: Formal and informal communication mechanisms	56
8.5	Description partners of the asymmetrical relationships	57
8.5.1	Academic medical center	57
8.5.2	Health fund	57
8.5.3	Certification institute	57
8.5.4	European project	57
8.5.5	Market leader	57
8.5.6	Research institute	57
8.6	Macro of the interview protocols (Dutch)	57
8.6.1	Initiatie	57
8.6.2	Coördinatie	58
8.6.3	Uitwisseling	58
8.6.4	Beëindiging	58
8.7	Photographs of the prototypes	58



## List of figures

Figure 1. Development of relationship-specific tasks along phases relationship development	8
Figure 2. Academic gaps	10
Figure 3. Asymmetry based on size and power	15
Figure 4. History and network development innovative SME	20
Figure 5. Relationship-specific tasks certification institute over time	28
Figure 6. Relationship-specific tasks European project over time	29
Figure 7. Relationship-specific tasks research institute over time	30
Figure 8. Relationship-specific tasks market leader over time	31
Figure 9. Relationship-specific tasks academic medical center over time	32
Figure 10. Relationship-specific tasks health foundation over time	33
Figure 11. Development relationship-specific tasks along with relationship evolution	38

## List of tables

Table 1. Innovative SMEs benefits and drawbacks	4
Table 2. Power sources	6
Table 3. Relationship termination strategies	9
Table 4. Assessment asymmetry	14
Table 5. Primary data sources	17
Table 6. Secondary data sources	17
Table 7. The relationship-specific tasks found compared to literature	35
Table 8. Relationship-specific tasks across categories of asymmetry	41

## List of abbreviations

e.g.	Exempli gratia
GDP	Gross Domestic product
IOR	Inter-Organizational Relationship
SME	Small and Medium-sized Enterprise

# 1 Introduction

## 1.1 The managerial gap

In 2004 an entrepreneur with diabetes invented a solution to improve the treatment of his disease: a closed-loop bihormonal artificial pancreas. This breakthrough in diabetes management includes the automated administration of insulin and glucagon while the glucose level of the patient is continuously monitored. For diabetes patients maintaining glucose levels in the normal range is essential for preventing diabetes related complications which include for example blindness, heart and cerebral infraction, foot ulcer or amputations. Thus, the portable bihormonal artificial pancreas has the potential to improve the quality of life of patients with diabetes. In the first years the inventor developed the artificial pancreas in collaboration with two friends who wanted to contribute the necessary software, technology and other knowledge. In 2006 the development of the device came to halt. The friends lacked the financial and knowledge resources to conduct the clinical trials necessary to demonstrate the functioning of the device. It proved to be difficult to find partners with the required capabilities willing to get the clinical trials underway. Only two years later the inventor and his team found an academic medical center prepared to design and carry out the trials in exchange of a small emission of the shares. For this purpose, an independent entity, a so called small and medium-sized enterprise (SME), was established in collaboration with an informal investor. In the years that followed, it turned out to be necessary to engage in a relationship with several other organizations. In 2012, the innovative SME started a three year research project funded by the European Commission. The project involves seven organizations from five different countries: an academic medical center (NL), the innovative SME (NL), a technical university (NL), a medical university (AT), an established industry player (DK), a clinical research institute (DE) and a software company (TR). In parallel the business collaborates with an independent research institute to develop a new sensor that measures the glucose level of diabetes patients more accurate than current sensors. Recently, the SME engaged in a relationship with one of the market leaders in the medical device market, in order to explore if the business can facilitate the distribution of the closed-loop bihormonal artificial pancreas when it is market ready.

It would have been extremely difficult or even impossible for the small enterprise to develop the artificial pancreas without the help of other organizations. However, collaboration is not without risks. In the future, the business may be forced to sell their patent to the market leader in order to get access to its distribution network. Nonetheless, if the market leader solely buys the patent for defensive purposes, the enterprise will not be able to fulfill their mission of bringing the artificial pancreas to the patients home. In addition, within the European project the activities of project partners need to be aligned, because the activities of partners are often necessary inputs for activities of other partners. For example, the clinical trials can only be executed by the academic medical center when the innovative SME finished the development of the prototype. The SME recognizes that the management of these issues is of major importance to increase the chance of a successful relationship. Therefore, the enterprise is in need of practical guidelines how to limit the negative effects generated by collaborating and increase its benefits. In this task special attention should be paid to asymmetrical relationships, because most of the relationships of the enterprise with other organizations are asymmetrical in the sense that their partners differ in size and or power from the SME. Unfortunately, as explained in the next paragraph, there is a lack of literature on how SMEs can manage its asymmetrical relationships over time.

## 1.2 The academic gap

Innovation in SMEs is important both because of its effects on the performance of these business and the potential for the SME sector to act as the initiator and catalyst for economic progress (Freel, 2000; Lind, 2012; Verhees & Meulenber, 2004; Wolff & Pett, 2006). For that reason the academic world should pay more attention to the stimulation of innovation in SMEs (Lind, 2012). The Industrial Marketing and Purchasing (IMP) research tradition has argued for the importance of inter-organizational relationships (IORs) of innovation in SMEs. Through partnerships a SME can acquire the resources and capabilities that are necessary in its path from invention to innovation (Konsti-Laakso, Pihkala, & Kraus, 2012). However, IORs are especially for SMEs difficult to develop and maintain (Colombo, Laursen, Magnusson, & Rossi-Lamastra, 2012). A movement within the IMP group has showed that there are considerable differences between businesses in their ability to handle partnerships. The results indicate that the ability of a business to manage their relationships can reduce the challenges associated with partnerships. In response, scholars proposed a wide range of relationship-specific tasks that can improve an organization's ability to manage its IORs. However, this work is based on research in large, established organizations, and empirical studies testing the applicability of the framework for SMEs are

scarce. Therefore, the practical value of the current literature on the management of relationships at SMEs is limited. And it precisely the practical relevance that is lacking in academia, but so necessary for SMEs to encourage them to overcome the barriers to successful innovation. Hence, in this thesis the methods to manage the relationships of SMEs are researched from a managerial point of view. In this tasks, there is a need for a more fine-grained analysis of asymmetry and management as a process. Firstly, the challenges of IORs are aggravated by their increasing asymmetry (Hurmelinna, Blomqvist, Puumalainen, & Saarenketo, 2005; Kalaiganam, Shankar, & Varadarajan, 2007; Mouzas & Ford, 2007). Within asymmetrical relationships, SMEs are widely considered to be in the subordinate position (Gardet & Fraiha, 2012). However, the number of studies that empirically research the management of asymmetrical relationships from the perspective of the subordinate SME is limited. Even when asymmetry was studied from the perspective of the SME scholars often focused on the analysis of one or two management tasks (e.g. Blomqvist, 1999; Mouzas & Ford, 2007). Secondly, research attempting to create insight into how SMEs manage their IORs should inject time as a variable (Parkhe, Wasserman, & Ralston, 2006). Relationships can change substantially beyond their original design once they are underway (Gulati, 1998). As a result, the allocation of management resources is fluid and the utilization of management behaviors varies over time (McGuire, 2001). Therefore, understanding network dynamics can provide critical insights into how they can be better managed (Gulati, 1998). Still, few empirical studies have paid attention to this topic in the context of SMEs. Thirdly, even less research has focused on both asymmetry and time simultaneously. With one exceptional article from Gardet and Fraiha (2012), no studies have been found that concentrate on the development of the process to manage asymmetrical relationships at SMEs. However, the authors analyzed the development of the tasks to manage the individual asymmetrical relationship along the evolution of the relationship portfolio. Without considering the interaction between the two levels of analysis, this approach can lead to the incorrect conclusions. In response to the void described in the literature above, in this paper the tasks that SMEs use to manage their asymmetrical relationships are researched over time.

### 1.3 Filling the managerial and academic gap

In order to position the research project within the wider research context elaborated in the previous paragraph a research objective is formulated. The research objective reads as follows:

*The research objective of this study is to fill the void in the relationship management literature concerning the tasks that an innovative small and medium-sized enterprise needs to execute to manage its asymmetrical inter-organizational relationships over time by comparing the management tasks executed in six asymmetrical inter-organizational relationships of a small and medium-sized enterprise over time.*

On the basis of the research objective, a set of research questions is formulated. The first central research questions involves the analysis of the tasks the SME uses to manage its asymmetrical relationships. The second central research question concerns the study of how the management tasks change during the SME's asymmetrical relationships. The third central research question entails the study of why the management tasks change during the SME's asymmetrical relationships.

- (1) What are the tasks executed by an innovative small and medium-sized enterprise to manage its asymmetrical relationships?
- (2) How do the tasks executed by an innovative small and medium-sized enterprise to manage its asymmetrical relationship change during the relationship?
- (3) What are the drivers of change in the tasks executed by an innovative small and medium-sized enterprise to manage its asymmetrical relationships?

In order to answer these questions in the next chapter the state-of-the-art literature on the management of asymmetrical relationships by SMEs over time is briefly discussed. Subsequently, the process research approach using case study methodologies that is used in this paper is clarified in chapter 3. The following chapter, chapter 4, presents the findings of the analysis of the management six asymmetrical IORs by the SME. Thereafter, the findings are compared with theory and across relationships in the chapter 5. The paper ends with chapter 6 that contains the theoretical contributions, managerial complications, research limitations and future research opportunities of this study.

## 2 State-of-the-art literature

### 2.1 Innovation by SMEs important for business growth and economic progress

Over the last decades SMEs have been growing in number (Jenkins, 2004). SMEs are defined, in accordance with European Law, as enterprises with less than 250 employees and a turnover of less than 50 million Euros or a balance sheet total of less than 43 million Euros (EU, 2005, p. 14), see appendix 8.1. Small and medium-sized businesses are argued to play an essential role as driver of most national economies (Wolff & Pett, 2006). However, the structure of the SME sector is characterized by many small businesses with small growth rates. In general these businesses generate little added value, because the added value per employee tends to increase with organization size. Consequently, the contribution to the Gross Domestic Product (GDP) of SMEs is limited. Therefore, more attention should be paid to the encouragement of SME growth in order to foster economic progress (Lind, 2012). Today's rapidly changing market continuously asks for new products, processes and business models. As a result innovation for SMEs is a crucial driver of business growth (Freel, 2004; Verhees & Meulenbergh, 2004; Wolff & Pett, 2006). The direct benefits of innovation on SME performance include (1) establishment of temporary monopolies, (2) introduction of innovation in attractive niches, (3) creating high brand loyalty of buyers, (4) reducing price competition, and (5) creating new demand (Porter, 1980; Schumpeter, 1934). Innovation also leads to indirect benefits, like the generation absorptive capacity, advantages in further innovation, and ability to set standards (Cohen & Levinthal, 1990). The benefits of innovation were confirmed by (Rosenbusch, Brinckmann, & Bausch, 2011) who found a positive link between innovation and SME performance at the aggregate level. Thus, innovation within SMEs is important both because of its effects on the growth of those businesses, but also because of the potential for the SME sector to act as the initiator, catalyst and medium for economic progress. Although it has not been possible to establish the relationship between organization size and innovation per se (Nieto & Santamaría, 2010), most studies conclude that small and medium-sized businesses can at least keep up with larger businesses in the field of innovation. In the next paragraph is explained that SMEs are often successful inventors, but they typically face considerable obstacles in their path towards innovation (Kleinknecht, 1989; Rosenbusch et al., 2011). In order to increase SMEs abilities to transform their new ideas into practice, collaboration has been offered as a solution (Jørgensen & Ulhøi, 2010).

### 2.2 The benefits and barriers of innovative SMEs

Table 1 shows that the main relative strengths of innovative SMEs compared to large businesses are behavioral. Generally, SMEs spend relatively more on research and development and prove to be more efficient in using it for innovative output (Dijk, Menkveld, & Thurik, 1997). The former is usually attributed to the willingness of the management to take risks and the motivation of the personnel, while the latter is related to the unique and scarce competencies often associated with SMEs and the fast recognition of opportunities. However, the main benefit of these businesses is the organizational flexibility reflected in the absence of bureaucracy, rapid decision making and capability to quickly adapt to changing circumstances (Freel, 2000; Nieto & Santamaría, 2010; Nootboom, 1994; Rothwell, 1991). On the other hand, the relative weaknesses of SMEs compared to large businesses lie in the constraints they face in gaining access to critical resources and capabilities for innovation (Nieto & Santamaría, 2010). As presented in table 1, these resources and capabilities constraints can be broken down into five components: (1) inadequate management, (2) lack of suitable qualified technical and managerial specialists, (3) inability to afford complementary assets, (4) problematic attraction of financial resources, and (5) limited identification and absorption of external knowledge (Freel, 2000; Gans & Stern, 2003; Kleinknecht, 1989; Nootboom, 1994; Rothwell, 1991; Woodcock, Mosey, & Wood, 2000). In sum, SMEs may well be inventive thanks to their behavioral benefits, but they often do not have the resources required to successfully turn inventions into innovation. In order to secure innovation success, SMEs face the need to cooperate with other organizations. Still there are both positive and negative implications for SMEs of innovation through cooperation as discussed in the next part.

Advantages	Disadvantages
<p><i>Organizational flexibility</i></p> <ul style="list-style-type: none"> <li>Lack of bureaucracy</li> <li>Rapid decision making</li> <li>Efficient and informal communication</li> <li>Research and development efficiency</li> <li>Capability for quick adaptability</li> </ul>	<p><i>Lack of adequate management</i></p> <ul style="list-style-type: none"> <li>Over-optimistic view of performance</li> <li>Poor planning and financial evaluation</li> <li>Discontinuity of management staff</li> <li>Deficiencies in market and competitor analysis</li> <li>Inadequate delegation</li> </ul>
<p><i>Characteristics management</i></p> <ul style="list-style-type: none"> <li>Willingness to take risks</li> <li>Horizontal leadership style</li> <li>Dynamic</li> <li>Motivated and committed</li> </ul>	<p><i>Limit access to skilled labor</i></p> <ul style="list-style-type: none"> <li>Limited job security</li> <li>Limited career opportunities</li> <li>Limited remuneration</li> <li>Limited training possibilities</li> </ul>
<p><i>Characteristics employees</i></p> <ul style="list-style-type: none"> <li>Motivated and committed</li> </ul>	<p><i>Lack of complementary assets</i></p> <ul style="list-style-type: none"> <li>Inability to internalize all knowledge</li> <li>Lack of economies of scale</li> <li>High sunk costs of market entry</li> </ul>
<p><i>Unique or scarce competencies</i></p>	<p><i>Financial constraints</i></p> <ul style="list-style-type: none"> <li>Attraction financial resources difficult</li> <li>Limited possibilities for synergies between projects</li> <li>Limited ability to spread of risks over portfolio of projects</li> </ul> <p><i>Lack of external knowledge</i></p> <ul style="list-style-type: none"> <li>Ability to absorb relevant knowledge limited</li> <li>Limited of technological knowledge</li> </ul>

Table 1. Innovative SMEs benefits and drawbacks

### 2.3 Cooperation as a means to overcome the barriers of innovation for SMEs

Traditionally, the focus of SME scholars was on the role of entrepreneurs in exploiting or enacting opportunities. Recently, this focus is shifting from largely internal factors to more external factors (Snehota, 2011). Researchers observed that SMEs increasingly rely on external sources of innovation by engaging in relationships with other organizations to secure their innovation success (Aaboen, Dubois, & Lind, 2011; Chesbrough, 2012; Colombo et al., 2012; van de Vrande, de Jong, Vanhaverbeke, & de Rochemont, 2009). In response, the Industrial Marketing and Purchasing (IMP) tradition has argued for the importance of external business relationships for SME development and innovation (Aaboen et al., 2011; Snehota, 2011). The modern understanding of doing business as inter-organizational interaction processes had been pioneered by their work (Ritter & Gemünden, 2003a). The group (see Håkansson & Snehota, 1995) proposes a model where IORs are formed by three basic elements: actor bonds, resource ties, and activity links. Through extensive interaction numerous resources are combined, complex activity chains are configured and numerous actors are bonded. The interaction in IORs is usually studied as dyads, or the relationships between two partners. In the IMP tradition conventionally defined as a buyer and seller (Holma, Björk, & Virtanen, 2009). However, numerous scholars have shown that in the innovation process a range of different types of external partner can play an important role to a business' innovation success (Raesfeld, Geurts, & Jansen, 2012; Ritter, 1999). Because the focus of this research is on encouraging innovation in SMEs, an IOR is more broadly defined, following Berends, Van Burg and Van Raaij (2010, p. 2), as the agreement between organizations specifying the contributions, rights and responsibilities of each organization in the pursuit of a particular objective. As shown in appendix 8.2, in this perspective IORs can encompass a broad array of cooperative exchanges ranging from joint ventures to consortia bound together by their actor bonds, resource ties, and activity links (Parmigiani & Rivera-Santos, 2011).

Several research traditions have emphasized the advantages of the engagement of SMEs in IORs for innovation. Firstly, the *resource-based view* (RBV) argues that IORs improve the access to resources and complementary assets which are often crucial for SMEs to ensure market exploitation, but cannot be purchased via market transaction and build internally within acceptable costs and time (Colombo et al., 2012; Hoffmann & Schlosser, 2001; Rogers, 2004). In contrast to the RBV, the *IMP tradition* assumes that resource heterogeneity extends the boundaries of businesses and the resources of a business are embedded in the resources of other organizations. Therefore, it is central for an SME to combine resources of other organizations to maximize the value of its existing resources (Aaboen et al., 2011). Thirdly, according to *knowledge-based theory* collaboration enhances the transfer and appropriation of knowledge which SMEs can use to accelerate their own internal innovation and its subsequent market exploitation (Bougrain & Haudeville, 2002; Hoffmann & Schlosser, 2001; Tomlinson & Fai, 2013). Lastly, *transaction cost theory* suggests that collaboration provides the potential for SMEs to minimize the risks and costs associated with innovation by sharing these burdens with their partner (Lasagni, 2012; Rothwell, 1991). Unsurprisingly, researchers have shown that IORs significantly boost innovation in all organizational contexts (Pittaway, Robertson, Munir, Denyer, & Neely, 2004). Therefore, scholars have argued that inter-organizational collaboration is becoming indispensable for the creation of successful innovations by SMEs (Chesbrough, 2012).

In response, it could be expected that SMEs rely extensively on IORs (Hoffmann & Schlosser, 2001). Nevertheless, SMEs are skeptical about networking and their tendency to collaborate is significantly less than that of large organizations (Hoffmann & Schlosser, 2001; Tomlinson & Fai, 2013). It may be that many SMEs are not exploiting the opportunities that collaboration can offer, because of the inherent difficulties in developing IORs (Aaboen et al., 2011; Tomlinson & Fai, 2013). Collaboration with external partners in innovation projects implies two major risks: *relational risk* and *performance risk* (Das & Teng, 2001). Relational risk refers to the probability and consequent actions when a partner does not appropriately commit to a relationship and fails to behave as expected (Ireland, Hitt, & Vaidyanath, 2002). Performance risk is concerned with the risk of unsatisfactory performance in spite of full collaboration. These risks are aligned with two complexities that characterize IORs (Ding, Dekker, & Groot, 2013): *appropriation concerns* and *coordination requirements* (Dekker, 2004; Ding et al., 2013). From the perspective of transaction costs, appropriation concerns are caused by the potential opportunistic behavior of partners (Ding et al., 2013; Sawers, Pretorius, & Oerlemans, 2008). Unintentional knowledge spillover is a huge threat for an SME participating in IORs, because when a partner act opportunistically and profit from knowledge spillovers an SME has little resources to litigate against their partner (Lawton Smith, Dickson, & Smith, 1991; Sawers et al., 2008). According to the IMP tradition, there is another set of concerns for SMEs resulting from the heavy costs that arise from the necessity to adapt resources, activity flows and organization of actors on both sides (Snehota, 2011). These coordination requirements arise from the likely interdependence of tasks and responsibility across organizational boundaries and the complexity of coordinating activities to be completed individually and jointly of organizations with diverging backgrounds (Ding et al., 2013; Gulati, 1998; Lawton Smith et al., 1991). These two complexities may overburden the SME (H Håkansson & Snehota, 1995; Rosenbusch et al., 2011), resulting in low levels of success (Sawers et al., 2008).

In conclusion, innovation would be extremely difficult for SMEs without collaboration. However, SMEs often find it difficult to establish and benefit from relationships with organizations, since they are confronted by hazards of collaboration (Ireland et al., 2002; Sawers et al., 2008). A notable trend is that these hazards are becoming more aggravated as relationships are increasingly asymmetrical (Blomqvist, Hurmelinna, & Seppänen, 2005; Kalaignanam et al., 2007).

## **2.4 Asymmetrical relationships increasingly common**

In response to rapid and costly technological changes, mergers and acquisitions, and the growth of outsourcing, cooperation between asymmetric partners is becoming increasingly common (Blomqvist et al., 2005; Mouzas & Ford, 2007). In line with Mouzas and Ford (2007, p. 43) and Johnsen and Ford (2002, p. 1), asymmetrical relationships are defined as relationships where there is an imbalance between partners or one of the organizations is be more able to dominate and influence the other, to initiate change in the relationship or to dominate the relationship. Within the IMP literature, the most researched source of asymmetry is power (Ford & Mouzas, 2013; Johnsen & Ford, 2001, 2002). Power refers to the capacity of actors to overcome resistance on the part of other actors in order to achieve desired objectives (Dahl, 1957). As presented in table 2, the literature on power distinguishes three sources of power: (1) hierarchical authority, (2) resource control and (3) network



centrality (Astley & Sachdeva, 1984). *Power asymmetry* exists in a relationship between two or more partners in which one partner has a substantially greater capacity to overcome resistance of the other partners due to their hierarchical authority, resource control, network centrality or a combination of these (Johnsen & Ford, 2001, 2002; Mouzas & Ford, 2007). When there is high power asymmetry within a relationship, the more powerful partner has the ability to maximize their private benefits without pursuing the common benefits in the relationships by appropriating their partners' tacit knowledge and delivering below standard outcomes (Das & Teng, 2002; Subramani & Venkatraman, 2003). On the other hand, less powerful businesses entering an asymmetric relationship often stake their reputation and future on the more powerful partners' integrity and willingness to find win-win solutions (Blomqvist et al., 2005). Although dependence on others is often considered a negative aspect of collaboration, an organization may seek dependence on others to minimize the need to invest in its own resources. If at the same time the organization's partner become dependent on them for coping with their own issues, these interdependencies provide a way for both actors to capitalize on the investments that they make in their own and in each other's resources (Håkansson & Ford, 2005; Mouzas & Ford, 2007).

Power source	Definition
Hierarchical authority	The notion of power in terms of hierarchical authority is grounded in the conception of power as the product of formal decree.
Network centrality	Network centrality can be regard as an additional source of inter-organizational power that is attached to an actor's position in the network
Resource control	The interpretation of power in terms of resource control is derived from the ability to control the supply of resources to others

Table 2. Power sources (Astley & Sachdeva, 1984)

Outside the IMP literature, the most cited source of relationship asymmetry is partner size (Blomqvist et al., 2005; Blomqvist, 1999; Kalaiganam et al., 2007). In line with the IMP literature, SMEs are often considered in a situation of dependence (Gardet & Fraiha, 2012). Dependence encompasses a organization's need to continue an exchange relationship to realize its goals and is considered the obverse of power (Emerson, 1962). However, Gardet and Fraiha (2012) show that small size is not synonymous with dependence. Therefore, size is regarded as a separate source of asymmetry. A relationship is characterized by *size asymmetry* when a small or medium-sized organization and a large one collaborate. Although a partnership between a small and large business has the potential to improve the economic prospects of both simultaneously (Alvarez & Barney, 2001). There are often important differences between the extent to which large organizations and SMEs benefit from a relationship (Alvarez & Barney, 2001; Kalaiganam et al., 2007). This is for example caused by the complexity of constructing a fair reward system (Das & Teng, 2002) resulting in the feeling of the SME to be unfairly exploited by the larger partner (Alvarez & Barney, 2001).

The negative consequences of asymmetry may lead to the conclusion that organizations should seek to avoid them (Mouzas & Ford, 2007). Undoubtedly, asymmetrical IORs constitute significant managerial and organizational challenges given the abovementioned risks and complexities (Schilke & Goerzen, 2010). These challenges are especially severe for SMEs, because it diverts resources and management time for the SME's core business, increases employee turnover, and requires heavy coordination investments (Colombo et al., 2012). However, SMEs may choose to become dependent on a larger, more powerful organization, because of the gains that can be derived from the relationship (Mouzas & Ford, 2007). Therefore, the question is not how to create symmetry; the question is more about how SMEs can best operate their asymmetric relationships. In the next paragraph, it is suggested that relationship management activities can reduce the challenges associated with asymmetrical relationships (Narula, 2004; Ritter & Gemünden, 2003b).

## 2.5 Network management reduces the challenges of an SME's asymmetrical relationships

While a moderate body of research is concerned with network management (e.g. Henneberg, Naudé, & Mouzas, 2010; Ritter & Gemünden, 2003b), a major debate still exists about the nature and possibility to manage IORs. Scholars representing the resource-based view perspective assume that large businesses have the ability to intentionally create, adapt, and control an IOR (Dyer & Nobeoka, 1998). Surprisingly, the entrepreneurship literature generally suggests relationship development as being controlled by the entrepreneur or its business as well (Slotte-Kock & Coviello, 2010). In contrast, IMP researchers Håkansson and Ford (2002) argue that the 'management-in-networks' is a matter of handling paradoxes. Firstly, the development of IORs gives opportunities

to the business, but at the same time imposes restrictions on its freedom to change. Secondly, a business' relationships are influenced by its strategy and actions, but the business itself is simultaneously influenced by its relationships. Thirdly, the more a business achieves its ambition of control, the less effective and innovative a relationship will be (Håkansson & Ford, 2002). This implies that *"the answers to manager's questions about their interactions will always depend on the specific situation and context. There are no neat solutions or standardized approaches to strategic network success."* (Håkansson & Ford, 2002, p. 138). In other words, no single central actor can be in charge of managing the relationship (Håkansson & Ford, 2002). Other IMP researchers nuanced this argument (e.g. Möller & Halinen, 1999; Ritter, Wilkinson, & Johnston, 2004). According to these authors, the inherent complexity of IORs means that it is unrealistic to argue that they can be wholly managed by one organization (Ford, 1997). Still *"even though individual companies may be limited in their actions, each actor in a network has some influence on the network, which can be managed more or less efficiently"* (Ritter & Gemünden, 2003, p. 745-746).

Both IMP researchers as outside scholars have provided empirical support that an organization's ability to develop and manage its relationships is asymmetrically distributed among organizations (Day, 2000; Dyer, Kale, & Singh, 2001; Dyer & Nobeoka, 1998; Ireland et al., 2002; Ritter & Gemünden, 2003b; Ritter et al., 2004). In addition, scholars have reported positive links between a business' relationship management and success in general (Ritter & Gemünden, 2003b), and innovative success in specific (Powell, Koput, & Smith-Doerr, 1996; Ritter & Gemünden, 2003b). The results indicate that the failure of IORs can often be attributed to ineffective relationship management (Fleming, King, & Juda, 2007; Ireland et al., 2002). On the contrary the better the partnership is managed, the more likely it is to achieve high standards of harmony, trust and commitment limiting the chance of opportunistic behavior and unmanageable coordination costs (Landsperger & Spieth, 2011). Hence when organizations actively manage their networks, this can directly lead to better results by reducing the risk of relationship failure (Gronum, Verreynne, & Kastle, 2012). Therefore, in this thesis the argument of Möller and Halinen (1999) and Ritter et al. (2004) is followed.

## **2.6 Relationship-specific management tasks change according to the relationship stage**

In response, to their argument Ritter and colleagues developed the concept of 'network competence' (Ritter & Gemünden, 2003b; Ritter et al., 2004; Ritter, 1999). Network competence is generally considered to consist of two interrelated components. In the first place organizations should have the necessary qualifications – knowledge, resources and relationships – to develop, maintain and use relationships (Ritter & Gemünden, 2003b; Ritter, 1999). As a rule SMEs have less knowledge, resources and relationships that are needed to manage external collaborations than large organizations (Hoffmann & Schlosser, 2001; Rosenbusch et al., 2011; Wynarczyk, Piperopoulos, & McAdam, 2013). Consequently, the success of SMEs in relationships can be attributed to the second aspect of partnership management which compromises the effective use of the qualifications these organizations do have. In other words, the realization of the capability to manage IORs effectively lies on the bundle of tasks performed to create successful relationships. Ritter and colleagues call this bundle of tasks 'network management tasks'. The authors further distinguish between relationship-specific and cross-relational tasks. The former are relevant to managing a single relationship, and the latter are necessary to manage a portfolio of relationships (Ritter & Gemünden, 2003b; Ritter et al., 2004; Ritter, 1999). As the central research question concerns the management of asymmetrical dyads, only the bundle of relationship-specific tasks is considered here. Relationship-tasks refer to tasks to establish, use, develop, routinize and dissolve a single relationship. Ritter and Gemünden (2003b) distinguish three types of tasks: initiation, exchange, and coordination. Although Ritter and colleagues did not discuss the issue in any detail nor base its main propositions on it, the authors noticeably imply that the relationships-specific management tasks develop along the relationship (Holmen, Roos, Kallevag, von Raesfeld, Boer & Pedersen, 2005).

Researchers have stressed that understanding network dynamics can provide critical insights into how they can be better managed (e.g. Gulati, 1998). Relationship dynamics simply connote "changes" in relationship (Chou & Zolkiewski, 2012). A hallmark of the IMP research tradition is that relationships are *"always in a state of ongoing change and appears thus intrinsically dynamic because of the continuous adjustments in relationships among businesses"* (Snehota, 2011, p. 3). The content of IORs are continuously adapted and developed (Hallen, Johanson, & Seyed-Mohamed, 1991) as a consequence of the extensive interaction on actor, resource and activity level (Håkansson, Ford, Gadde, Snehota, & Waluszewski, 2009). In 1980, IMP researcher Ford developed a model of relationship development which compromises five stages of evolution: (1) pre-relationship

stage, (2) early stage, (3) development stage, (4) long-term stage, and (5) final stage. Where changes in experience, uncertainty, distance, commitment, and adaptation describe transitions from one stage to another. Over the years, the model was further developed and refined by many scholars inside and outside the IMP group (e.g. Snellman, 2001; Wilkinson & Young, 1994). Based on a literature review, Das and Teng (2002) propose three main phases: formation, operation and outcome. In the *formation phase* the SME identifies partners, negotiates deals, carries out the agreement and sets up the partnership. In the *operation phase* the partners start to operate the relationship by collaborating and implementing all agreements of the relationship. In the last stage, the *outcome phase*, tangible results are obtained and evaluated. The relationship evolves in response to three conditions: interdependencies, collective strengths, and inter-partner conflicts (Das & Teng, 2002).

The stage model is exposed to some criticism especially regarding its deterministic nature, because empirical studies just found mixed evidence for the stage model (Holmen et al., 2005). However, for analytical purposes it is useful to separate the development of relationships in stages (Ring & Van de Ven, 1994). In this way, a conceptual model can be developed of how relationship-specific tasks evolve according to the stages of the relationship. For this purpose, the phases proposed by Das and Teng (2002) are combined with the relationship-tasks of Ritter and Gemünden (2003b) and Ritter and Geersbro (2011). Yet, the proposed relationships-specific tasks are types rather than specific tasks, and therefore the framework of Ritter and colleagues remains rather generic. Consequently, its value for SMEs as guidance for the management of asymmetrical relationships is limited. For this purpose, the types proposed by Ritter and colleagues are filled out with specific tasks mentioned in the fields of industrial marketing, organizational theory, and strategic management literature. The conceptual model is presented in figure 1. In appendix 8.3, a table with the references is presented.

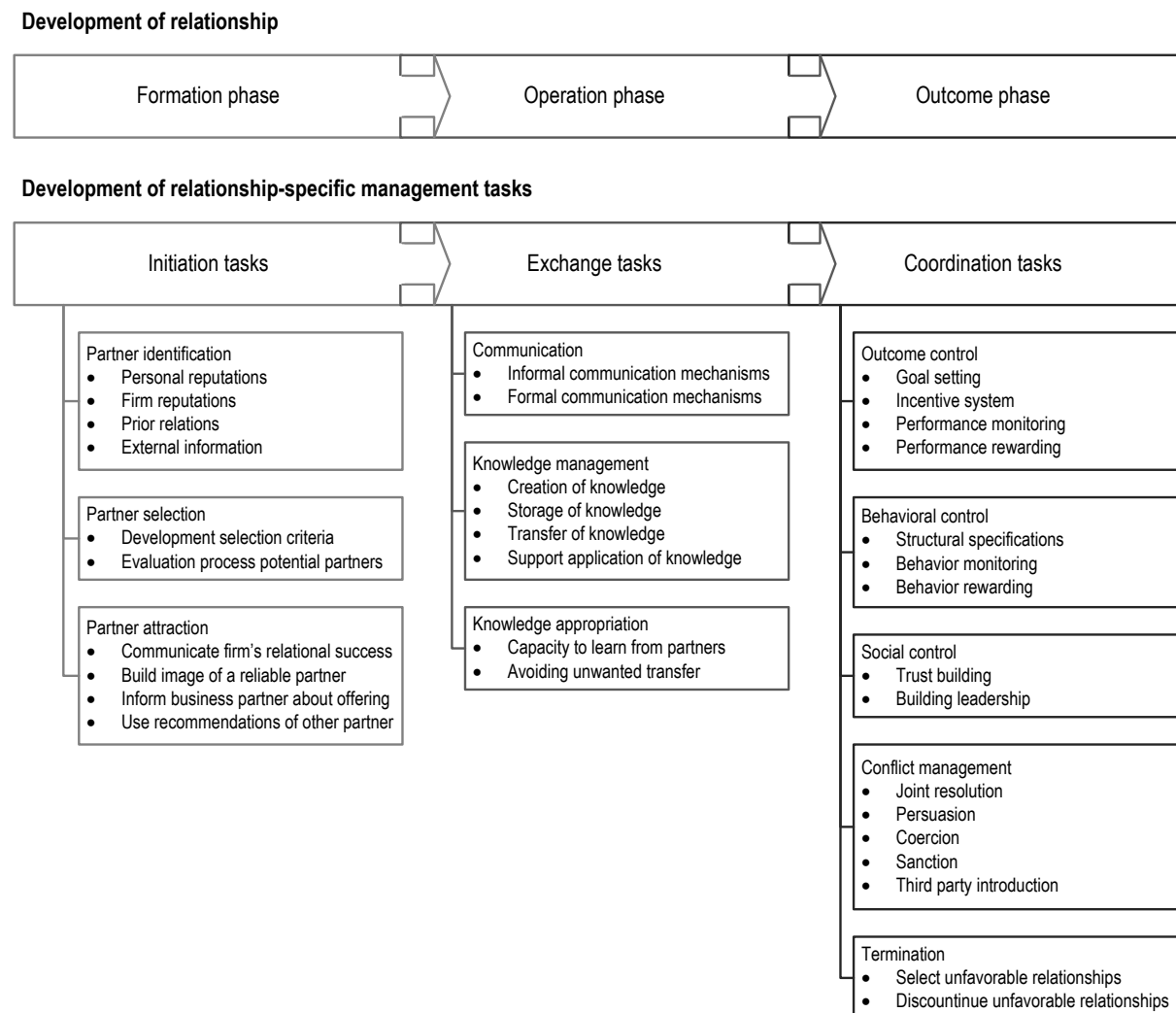


Figure 1. Development of relationship-specific tasks along phases relationship development

In the first column of figure 1 it is shown that in the formation phase of the relationship, initiation tasks need to be carried out. The extant literature suggests four different tasks that have to be executed by a SME to initiate a relationship. The first is the *identification* of external partners by consulting external information sources, prior relationship history, individual friendships as well as personal and organizational reputations (Larson, 1992; Ritter, 1999). Secondly, SMEs face the need to select partners with whom to collaborate by developing selection criteria and an evaluation process of potential partners (Ding et al., 2013). The third task is the *attraction* of partners referring to the actions which are oriented at building an attractive image of the business by communicating the business' relational success, informing the partner about the business' offering and building an image of a reliable partner (Mitrega, Forkmann, Ramos, & Henneberg, 2012; Mitrega & Ramos, 2011). In this way SMEs and their partners develop joint expectations about their motivations, possible investments, and perceived uncertainties. This involves formal bargaining to persuade, argue, and haggle over possible terms and procedures. Underlying this formal bargaining are processes of informal sense making which result in unwritten and non-verbalized expectations about each other's duties and obligations (Ring & Van de Ven, 1994).

The second column of figure 1 presents the exchange tasks that are executed in the operation phase. An important part of the operation phase is the exchange of money, information, products, services, knowledge, and personnel (Dwyer, Schurr, & Sejo, 1987). For this purpose, the SME has to build formal and informal communication mechanisms. Explicit and written exchanges are formal communication mechanisms, while informal exchanges are implicit and verbal (Gardet & Fraiha, 2012), see Appendix 8.4. In order to enable effective learning a mix of formal and information communication tools should be developed to transfer, create, store and support the application of knowledge between partners (Gardet & Fraiha, 2012; Hoffmann, 2005). In addition, communication mechanisms can be used by SMEs to monitor the exchange of information and create mobility barriers to protect its core resources (Hoffmann & Schlosser, 2001).

The coordination tasks that are used to manage a relationship in the outcome phase are displayed in the third column of figure 1. Coordination includes behavior, outcome, and social control, conflict resolution mechanisms as well as termination. *Behavior control* mechanisms denote structural specifications of how partners should act and monitoring whether actual behaviors meet pre-specified behaviors (Dekker, 2004). It includes specifying the roles, procedures and responsibilities of each actor and how to adapt them in the face of changing circumstances (Schreiner, Kale, & Corsten, 2009). *Outcome control* mechanisms should also be present to specify clear and realistic objectives and monitor and reward the achievement of these targets (Dekker, 2004). The principle mode of *social control* is trust building (e.g. Bryson & Crosby, 2006; Dekker, 2004; Hoffmann & Schlosser, 2001). Trust can be build by demonstrating competency, good intentions, and sharing information and knowledge. Besides trust, social control also involves building leadership. Another aspect of relationship coordination is the utilization of *conflict resolution mechanisms* (Bryson & Crosby, 2006). Gardet and Fraiha (2012, p. 220-221) propose five conflict resolution modes adapted from Mohr and Spekman (1994): (1) joint resolution (2) persuasion, (3) pressure (4) penalty, and (5) third party introduction. *Termination* involves a set of activities and routines which are implemented to enable the termination of undesired relationships. It comprises a business' ability to select and discontinue relationships with undesirable partners (Mitrega et al., 2012). In order to select unfavorable relationships an organization should assess their profit and costs, rank order the relationships according to their performance and analyze the direct and indirect costs of termination (Mitrega et al., 2012; Ritter & Geersbro, 2011). In order to end a relationship with an unfavorable partner, a business has to decide how to communicate to the partner its desire to exit. Alajoutsijärvi, Möller and Tähtinen (2000) proposed a typology of relationship termination strategies, depicted in table 3 based on the work of Baxter (1985).

		Other-oriented	Self-oriented
Indirect	Disguised exit	Pseudo-de-escalation	Cost escalation
			Signaling
	Silent exit	Fading away	Withdrawal
	Communicated exit	Negotiated farewell	Fait accompli
			Attributional conflict
Direct	Revocable exit	Mutual state-of-the-relationship talk	Diverging state-of-the-relationship talk

Table 3. Relationship termination strategies (Alajoutsijärvi et al., 2000)

## 2.7 Conclusion

The discussion of the state-of-the-art on the management of asymmetrical relationships by SMEs over time shows that a rich amount of knowledge about the innovative SMEs, asymmetrical relationships, relationship-specific management tasks and relationship change have been developed. Over the years considerable advancements have been made in the knowledge about SMEs managing asymmetrical relationships by combining these topics both within as outside the IMP research tradition. However, there is room for improvement as shown in figure 2. Colombo et al. (2012, p. 182) argue that *“the issue of how SMEs should organize in order to limit the negative effects generated by networking and increase its benefits is still poorly investigated”*. In specific, the authors – among others – argue that the effectiveness of the varying management methods to strengthen collaboration and boost the innovativeness of SMEs should be analyzed from a managerial point of view (Colombo et al., 2012; Ojasalo, 2008). The value of the current literature on the management of relationships by SMEs for managers is constraint for five reasons. Firstly, the literature on relationship-specific management tasks is build upon research in large, established organizations (1). Due to differences in organizational size, the theories developed for large organizations cannot be applied to small organizations without further research (Lind, 2012). However, studies that empirically test the details of relationship management in the context of SMEs are scarce (Street & Cameron, 2007). Secondly, studies that research relationship-specific management tasks in the context of the SMEs often neglect the underlying management process (2) (Parkhe et al., 2006; Ritter et al., 2004; Shaw, 2006; Slotte-Kock & Coviello, 2010; Street & Cameron, 2007). From a managerial point of view the value of this research is limited, because the allocation of management resources in relationships is expected to be fluid and the utilization of management behaviors to vary over time (McGuire, 2001). Thirdly, when time was incorporated often it was studied if the relationship-specific management tasks changed and how they changed along the development of the SME – often a start-up – or its portfolio, but did not involve the development of the individual relationship (3) (e.g. Aaboen et al., 2011; Gardet & Fraiha, 2012). Methodologically it can be argued that the researchers created a conflict in the level of analysis. Through this methodological shortcoming, the danger arises that SME managers apply tasks that belong to the stage of business' development or its portfolio, but are not effective for the performance relationship. Fourthly, the number of studies focusing on relationship-specific tasks to establish and maintain asymmetrical relations from the perspective of the SME is limited (4) (Bengtsson & Johansson, 2012). Even when asymmetry was explicitly studied from the perspective of the SME often the researchers considered one source of asymmetry or focused on the analysis of one or two management tasks of the SME (e.g. Blomqvist, 1999; Mouzas & Ford, 2007). The fragmentation of the literature into this subject makes it difficult for SME managers to comprehend. Lastly, no studies have been found that concentrate on the development of relationship-specific management tasks of SMEs along the evolution of the asymmetrical relationship with partners. This study will fill the voids in the relationship management literature by researching the tasks that innovative SMEs need to carry out to effectively manage the IORs with asymmetrical organizations over the relationships life-time. As discussed in the next chapter, a process research approach is taken to achieve this aim.

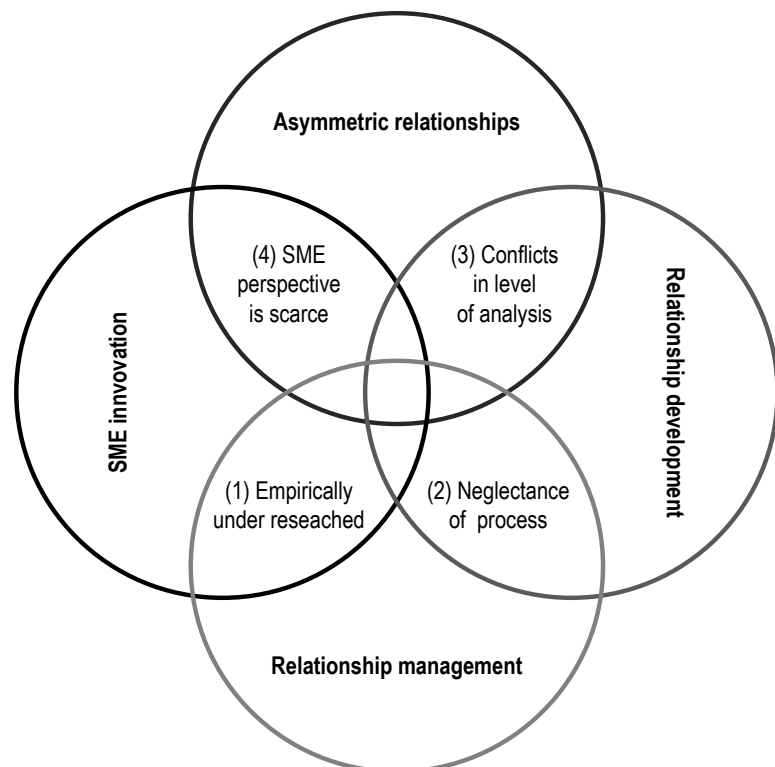


Figure 2. Academic gaps

### 3 Methodology

In order to gain a better understanding of how a SME manages the relationships with the asymmetrical partners over time, a process research approach is adopted. Process research involves *“the study of how and why some significant temporally evolving phenomenon unfolds over time”* (Bizzi & Langley, 2012, p. 225). Thus, process research emphasizes temporal evolution and emergence rather than the relationship between independent and dependent variables as is currently the dominant approach in business studies (Bizzi & Langley, 2012).

The process approach is suitable to answer the central research questions as formulated in chapter 1, because it involves examining *how* the relationship management practices of SMEs in respect to its asymmetrical partners unfold over time. Bizzi and Langley (2012) state process research is needed to address such how questions, since static variance type generalization are only able to explain co-variance between variables. In addition, the temporality dimension of the world is underplayed in variance-base research that either ignores it altogether, reduces its role to comparative statistics, or compresses it into variables (Van de Ven & Poole, 2005). Yet, relationships are by its very nature dynamic and susceptible to change. Therefore, the temporal dimension cannot be ignored in this research (Bizzi & Langley, 2012; Halinen, Medlin, & Törnroos, 2012). Thus, the process research approach fits to the research question, and in addition contributes to the current research domain by using a approach that is often neglected in business research.

Process research methodologies are often based on qualitative case studies. A case study is according to Yin (1989, p. 23) an empirical inquiry that (1) investigates a contemporary phenomenon within its real-life context, when (2) the boundaries between phenomenon and context are not clearly evident, and (3) multiple sources of evidence are used. The case study is the most suitable for the study of business relationships, because it allows the research of a phenomenon which is difficult to detach from its context but necessary to study within its context to understand the dynamics involved (Halinen & Törnroos, 2005; Yin, 1989). In addition, case studies are well suited to creating managerial relevant knowledge, because they are conducted in close interaction with practitioners and deal with real management situations (Gibbert, Ruigrok, & Wicki, 2008). As the case study provides a many-sided view of a situation in its context, this approach will be followed in this research.

Process research using case study methodologies engages researchers in a number of important conceptual and methodological choices (Langley, 1999). Bizzi and Langley (2012) identify five methodological themes that need to be addresses to design a process study: temporal orientation, units of analysis, sampling, data sources, and data analysis. Each of these is discussed in turn in order to create an adequate research design to address the central research questions.

#### 3.1 Temporal orientation

Processes have variable degrees of temporal embeddedness (Langley, 1999). In specific, process studies may either trace processes backwards in the past or follow them forward in real time (Halinen & Törnroos, 2005). Retrospective case research usually starts from knowledge of an outcome, and then works backwards to analyze how it arose. Real time longitudinal process research captures the ongoing development of relationships as they emerge. On the one hand the advantage of retrospective research is that it is particularly suitable to track network processes and evaluation over large windows of time, because it narrows down the range of phenomena that need to be examined, focusing data collection and analysis (Bizzi & Langley, 2012). This enables the research to detect substantial changes in partnerships and clear temporal patterns (Provan, Fish, & Sydow, 2007). Yet, the quality of retrospective research depends on events some time after they have occurred. In addition, it can lead to hindsight bias, the unconscious rationalization of past events so that they seem more linear than they in reality were. On the other hand, the benefit of real time research is that it can capture the process in all its richness. In this way, it offers opportunities to challenge the assumptions of variance theories (Bizzi & Langley, 2012). However, the study can be time-consuming and its open-endedness can be problematic *“as the focus of action may shift and outcomes emerge only gradually”* (Bizzi & Langley, 2012, p. 227). In order to handle the trade-off between retrospective and real-time research it is suggested to combine the two designs (Leonard-Barton, 1990). Following Leonard-Barton (1990) in this research the two designs are combined to study the evolvement of the practices that are used to manage the relationships with asymmetrical partners. A retrospective analysis is conducted up to point of entry into the ongoing situation, thereafter the relationships will be followed in real time.

### 3.2 Unit of analysis

The question arises what is and is not part of the process being studied. Halinen and Tornroos (2005) offered four alternatives to draw boundaries around the object of study in case study research of relationships. Researchers have the choice to examine:

1. Single firms and their linkages to others;
2. Dyads and their connections to the broader network;
3. A set of firms and their relationships; or
4. An international network of large multidivisional firm and its external linkages.

The primary guideline to be used in the delimitation of a case network is the content of the research objective (Halinen & Törnroos, 2005). In the research objective in paragraph 1.3 is written that the void in the networked innovation literature is filled “*by comparing the management tasks executed in six asymmetrical inter-organizational relationships of a small and medium-sized enterprise over time.*” At first glance the first two alternatives seem appropriate to achieve the research objective, because both involve individual relationships as object of study. However, several scholars have noted that the focus on a so-called ego network does not allow the research to fully capture the dynamics inherent in a relationship (Gulati, 1998; Khanna, 1998; Lavie & Rosenkopf, 2006). Although collaboration with partners are basically dyadic exchanges, the key antecedents, processes and outcomes associated with them can be defined and shaped by the wider network which organizations are embedded (Gulati, 1998; Khanna, 1998). Thus, any view of a single organization and their linkages to others is inevitably restricted and biased and gives an incomplete view of the world surrounding it (Håkansson et al., 2009). Therefore, it is chosen to focus on dyads and their connections to the broader network over time.

### 3.3 Sampling

As Bizzi and Langley (2012, p. 228) formulate it: “*Process researchers need to choose cases to study, incidents to examine, people to talk to, time periods to focus on – in other words, they need to think about sampling.*” In specific, researchers have to consider how these choices affect the information-richness of the results of the study (Bizzi & Langley, 2012). Trade-offs between depth and breadth are often raised during sampling in process research. While in-depth single case studies tend to generate a rich understanding of a particular context, there is a risk of generating rather idiosyncratic stories where general conclusions are hard to reach. In contrast, multiple case studies offer the possibility to develop insight from cross-case comparison, but the analysis of the cases may be superficial (Bizzi & Langley, 2012). In order to balance the trade-offs, in this research a single embedded case study will be conducted. Yin (2003) distinguishes between four case study strategies based upon two dimensions: single versus multiple case, and holistic versus embedded case. In a single embedded case study the researcher examines a single organization, but compares a number of logical sub-units within the organization (Saunders, Lewis, & Thornhill, 2009). A single case study is a suitable design for the research on inter-organizational partnerships, because the objective of providing holistic descriptions to learn about their nature, management and evaluation is such a demanding task that it is often the only option (Halinen & Törnroos, 2005). As it was impossible for the researcher to identify and gain access to multiple cases due to time limitations, in this instance a single case study was unavoidable.

The objective of this research is to gain an understanding into the ways in which SMEs can overcome the barriers to innovation. As discussed in chapter 2, SMEs often have difficulties with turning an invention into innovation. In order to conquer these hazards, they have to collaborate with organizations in their network. However, to turn networked innovation into a success these businesses have to actively manage their asymmetrical relationships. Hence, it would be valuable to study a SME that is currently turning an invention into an innovation by the means of cooperation. In order to ensure full access to an organization, it is preferred to select one of the organizations belong to the European research project to which this study belongs. The research is part of an European research project funded by the European Commission (EC) under the *Seventh Framework Programme for Research and Technological Development (FP7)*. The three year project started in September 2012 with a total budget of €5.5 million. The main goal of the European project is to bring a portable bihormonal artificial pancreas to the patients’ home. The projects involves seven organizations from five different countries: an academic medical center (NL), the innovative SME (NL), a technical university (NL), a medical university (AT), an established industry player (DK), a clinical research institute (DE) and a software company (TR).

Only three of these organizations could be considered a SME according to the European Law: the innovative SME, the clinical research institute and the software company. And just the first one can be considered an inventive SME. The business is a young SME started by an inventor and informal investor based on a patent on a closed-loop system for an artificial pancreas in 2007. The business plays a central role in the European project, because they are the inventors of the system. While the other two SMEs contribute their knowledge to the further development of the bihormonal artificial pancreas, they did not invent the system. However, the SME recognizes that it needs the partners within the European project as well as other organizations to achieve their mission of bringing the artificial pancreas to the patients home. In conclusion, the innovative SME is the most suitable organization to study the network activities needed to manage asymmetrical IORs over time. The reason for this is that this company is the inventor of the system and it cooperates with other organizations to achieve its goals. As explained in paragraph 3.1 a retrospective and real-time research design are combined in this study. The retrospective study will be undertaken from the invention of the artificial pancreas in 2004 by the inventor until the moment the researcher physically started with her internship at the SME at May the 1<sup>st</sup> 2013. From that moment on, the researcher follows the network of the SME until October the 30<sup>th</sup> 2013 a period of six months in real time.

### 3.4 Comparison across relationships and with theory

In order to simulate theoretical creativity, improve rigor, and in arguing for generality, inserting some form of comparison into a study can be helpful (Bizzi & Langley, 2012; Gibbert et al., 2008). In particular, two forms of comparison will be incorporated in this research: comparison across relationships and with theory. These two are explained in the next paragraphs.

#### 3.4.1 Comparison across relationships

The value of cross-case comparison is often emphasized in the literature to improve the external validity (Gibbert et al., 2008; Pettigrew, 1997). Eisenhardt (1989) suggests that a cross-case analysis involving four to ten case studies may provide a good basis for analytical generalization. Analytical generalization entails the generalization from empirical observation to theory rather than a population (Gibbert et al., 2008). Instead of analyzing multiple case studies from different organizations, researchers may also conduct different case studies within one organization (Yin, 1989). Therefore, it was chosen to focus on multiple IORs of the SME. In this way, the dyadic relationships of the business can be compared with each other. The study will limited itself to the examination of the asymmetrical relationships of the inventive SME in which the business is subordinate to the partner in terms of size and or power. *Size* is operationalized as the number of employees of an organization. According to the definition of the European Union definition an organization with less than 10 employees is a micro enterprise, more than 10 but less than 50 a small enterprise, more than 50 but less than 250 a medium-sized enterprise and an enterprise with over 250 employees is large. See table 4 for the results. Size is an objective measure in variance-base research often used as a proxy of power. However, the measurement of asymmetry based on size is rather generic. In addition, research has shown that size is not always synonymous with power. Hence, asymmetry is also measured on power.

*Power* is operationalized as the capacity of actors to overcome resistance on the part of other actors in order to achieve desired objectives (Dahl, 1957), based on three sources of Astley and Sachdeva (1984): hierarchical authority, resource control and network centrality (see table 2, chapter 2). In order to measure the power a partner, the owners of the inventive SME were asked to assess the power of their partners in comparison with the business. For this purpose, the owners rated three questions on a range from 'less than' (-1), 'similar to' (0), to 'more than' (1) for each of the partners. The questions were: (1) How much control has partner A over the resources needed for the innovation project in comparison to your business? (2) How central is the position of partner A in your network in comparison to your business? (3) How much influence has partner A based on their position in comparison to your business?<sup>1</sup> Afterwards the scores of the three sources of power were added to establish an overall assessment of power. In table 4 the results are presented.

---

<sup>1</sup> Translation from Dutch, the original questions are:

- (1) Hoeveel controle heft partner A over de essentiële middelen in het innovatie project in vergelijking met jullie bedrijf?
- (2) Hoe centraal staat partner A in het netwerk in vergelijking met jullie bedrijf?
- (3) Hoeveel invloed heeft partner A op basis van haar positie in vergelijking met jullie bedrijf?



Organisation	Type of IOR	Size		Power			Sum	Category
		Employees (in 2012)	Category	Hierarchical power	Resource control	Network centrality		
European project	Consortium	46954	Large	1	1	1	3	More
Academic medical center	Joint venture/Consortium	7028	Large	1	1	0	2	More
Certification institute	Vertical relationship	28340	Large	-1	0	1	0	Similar
Health fund	Cross-sector partnership	33	Small	1	1	0	2	More
Electronics company	Vertical relationship	1	Micro	0	0	-1	-1	Similar
Software company	Consortium	55	Medium	-1	0	-1	-2	Less
Medical university	Consortium	1700	Large	-1	0	0	-1	Similar
Established industry player	Consortium	34731	Large	-1	0	1	0	Similar
Clinical research institute	Consortium	200	Medium	-1	0	1	0	Similar
Regional hospital	Cross-sector partnership	5275	Large	-1	-1	-1	-3	Less
Market leader	Alliance	82089	Large	-1	0	1	0	Similar
Research institute	Alliance	3892	Large	0	0	0	0	Similar
Technical university	Consortium	3240	Large	-1	1	-1	-1	Similar
Local hospital	Cross-sector partnership	3418	Large	-1	-1	-1	-3	Less

**Table 4. Assessment asymmetry**

In order to decide whether there is asymmetry between the SME and the partner cutoff points were established. For power asymmetry to exist the partner should score an added value of lower than -1 or higher than 1. Otherwise there is not enough imbalance in power to speak of actual asymmetry. As the focus of this research is on asymmetrical relationships in which the SME is less powerful partner, values of below -1 will be neglected. For size asymmetry to be present the partner should have more than 250 employees. SMEs are generally grouped into one category, and considered to have similar characteristics.

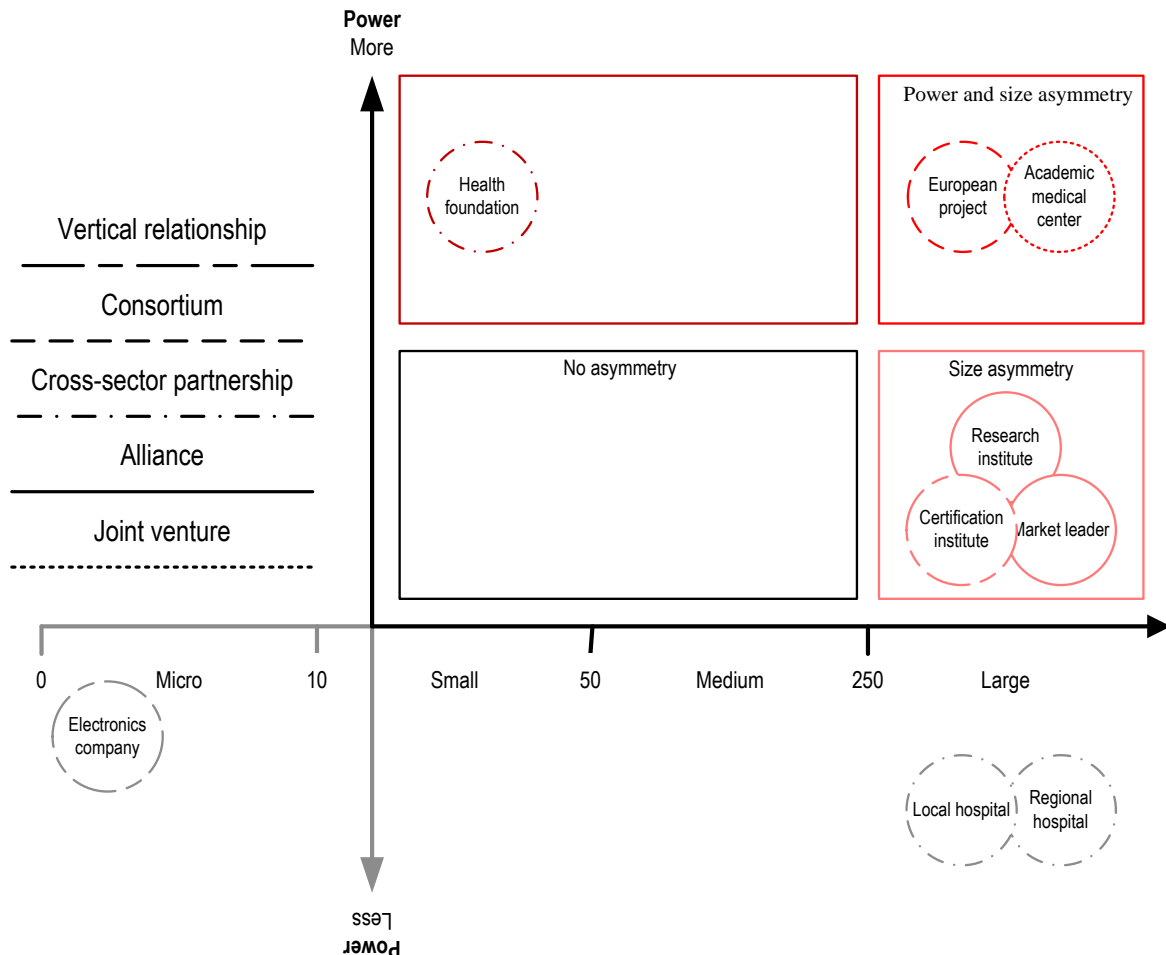


Figure 3. Asymmetry based on size and power

In figure 3 the two sources of asymmetry are combined. As shown in the figure three categories of asymmetry can be distinguished. Firstly, the relationships in the group in the bottom left corner are characterized by power asymmetry, but not size asymmetry. The relationship of the SME with the health foundation is in this category. Secondly, the category in the top right corner includes the relationships with the academic medical center and the research institute. These relationships are characterized by both power and size asymmetry. In addition, the European project falls in this category. As presented in table 4, the consortium members were separately rated by the SME's owners. Instead of analyzing the consortium members independently, the project is considered a stand-alone IOR. Parmigiani and Rivera-Santos (2011) define a consortium as a separate type of IOR (see appendix 8.2). The reason for this is that the members of a consortium cannot be seen in isolation, because of their close connection they are highly interdependent. As one of the owners of the innovative SME said "they (the project partners) are on their own not really important for the development... On the other hand, we landed the European project with them. And the project in itself is very important. When you consider them separately they are insignificant, but together they are very important."<sup>2</sup> It should be noted, however, that the academic medical

<sup>2</sup> Translation from Dutch, the original citation is: "Verder kom je dus bij alle partners van het Europese project. Die zijn in zichzelf allemaal niet heel zwaarwegend in de ontwikkeling daarvan... Aan de andere kant daar hebben we wel het Europese project mee binnen gehaald. En dat project in zichzelf was wel weer heel belangrijk. Als je het los beschouwd, maar bij elkaar is het wel heel belangrijk."

center is analyzed as a separate relationship, because it already formed a joint venture with the innovative SME before the start of the consortium. The other organizations had a relationship with the business since the initiation of the project. Thirdly, the relationships in the group in the bottom right corner are characterized by size asymmetry, but not power asymmetry. The relationships of the SME with the market leader and certification institute are in this category. In conclusion, based on the three sources of asymmetry – size and power – six asymmetrical IORs were identified that can be compared with each other to increase the external validity of this study. The six partners are the academic medical center, certification institute, health fund, European project, market leader, and research institute. See for a short description of the IORs appendix 8.5.

### 3.4.2 Comparison with theory

In order to defend the research conclusions, the researcher needs to provide logical reasoning that is powerful and compelling (Yin, 1989). For the internal validation, it is important to have an initial definition of the research question at least in broad terms. The research questions provides a focus, reducing the change of the researcher becoming overwhelmed by the data. In addition, it permits the scholar to specify the kind or organization to be investigated, and the kind of data to be gathered (Eisenhardt, 1989). In paragraph 1.3 the central research questions that are aimed to provide guidance in the research are stated. Thereafter a conceptual framework was developed based on relevant literature of the development of the relationship-specific tasks. In other words, the studied constructs were specified a priori. Although it is uncommon in case studies to date, it helps the design of the research because it permits researchers to measure constructs more accurately (Eisenhardt, 1989). In particular, an overview was made in chapter 2 of the relationship management tasks that organizations use according to relevant scientific literature. The overviews are shown in figure 1. It is important to recognize that the research question and possible constructs are tentative in this type of research. Nevertheless, the results of case study data collection and analysis can be used to compare the findings of the case study with the constructs derived from existing literature. The constructs can either be validated or found to be inadequate in the context of small and medium-sized social enterprises. If the constructs are confirmed, then the researcher has a firmer empirical grounding for the emergent theory. However, if the constructs are found to be inadequate, they can be further refined based on the case study findings (Eisenhardt, 1989; Gibbert et al., 2008).

### 3.5 Data sources

Bizzi and Langley (2012) argue that there are multiple data sources for process research with a specific emphasis on the 'big three' of qualitative research: interviews, observations and archival documents. Interviews are temporally valuable, because people can draw on their memories and link phenomena across time. In addition, they can be multiplied relatively easily. However, interviews are based on subjective interactions that are influenced by impression management, memory loss and the quality of the relationship between the interviewer and interviewee. Observations, on the other hand, are useful for understanding behavior, but they rely on the researcher as an instrument. Finally, while documents and archives are useful to construct key event chronologies, they tend to overlook complexity and conflict. The benefits and limitations of the data collection methods suggest the need for triangulation (Bizzi & Langley, 2012). Triangulation "*refers to the use of different data collection techniques within one study in order to ensure that the data are telling you what you think they are telling you*" (Saunders et al., 2009, p. 146). In order to capture the complexity of partnerships, the need for multiple data sources is even more urgent (Bizzi & Langley, 2012). In order to ensure construct validity chance is eliminated as much as possible. This is essential as only an individual case is used (Doorewaard & Verschuren, 2010; Gibbert et al., 2008). Therefore, in this research these three data sources will be used in combination. Nine semi-structured interviews were held with key persons from the dyadic relationships between innovative SME and their asymmetrical partners, see for the interview questions appendix 8.6. The selection of interviewees was based on (1) direct interaction with the other partner(s) in the IOR and (2) the direct involvement into the innovation project. At least one person other than from the business is interviewed for every IOR. Furthermore, passive observations will be carried out during the researcher's six months of internship at the innovative SME. In order to reduce hindsight bias, every once a week the researcher wrote a short evaluation of the previous week in a digital diary. In order to complete the 'big three' archival documents, like non-disclosure agreements, project descriptions, patents, and the like are used. In table 5 and 6 an overview can be found of the data sources divided in primary and secondary.

Interviews		Passive observation		
Organization	Interviewee	Date	Length	
Academic medical centre	First PhD student	2-7-2013	29 min.	On average four days a week for six months
AMC/SME	Second PhD student	21-6-2013	34 min.	
SME	Inventor	20-6-2013	101 min.	
SME	Informal investor	28-7-2013	54 min.	
Health fund	Head knowledge	3-7-2013	28 min.	
AMC	Project leader	2-7-2013	32 min.	
Technical university	Director	24-7-2013	55 min.	
Market leader	Head business	28-7-2013	51 min.	
Research institute	Manager SME	25-7-2013	42 min.	

Table 5. Primary data sources

Internal data	External data
63 pages of interviews	9 articles about the innovation project
72 pages of project description	13 web pages of partners
15 pages of observation diary	
120 pages of presentations and reports	
2 contracts	

Table 6. Secondary data sources

### 3.6 Data analysis

In order to provide valuable answers to the central research questions of this study, ATLAS software is employed to analyze the recorded interviews as well as the weekly diary reports and archival documents. Data from the different sources were coded using content analysis techniques. In step one, the data was coded into three categories – initiation, exchange, and coordination - corresponding to framework of the relationship-specific management tasks (see figure 1, chapter 2). When the categories appeared to fit the data well, the categories were subdivided in eleven sub-categories that belong to each of the three categories: partner identification, partner selection, partner attraction (initiation), communication, knowledge management, knowledge appropriation (exchange), outcome control, behavioral control, social control, conflict resolution mechanisms, and termination (coordination). In step two the data was coded into the three phases of relationship development, namely formation, operation, and outcome. However, the data did not fit to the proposed categories. Based on an in-depth analysis of the interviews four phases could be distinguished: identification, negotiation, agreement and operation. In step three the eleven sub-categories coded in step one were linked to the phases identified in step two. As presented in the next chapter, the sub-categories could generally be linked to either one of the phases. Based on the outcomes of this comparison in step four the causes of change from one phase to the next were identified. The results showed that two drivers could be identified: performance and relational risks. As explained in chapter 5, these resemble the complexities associated with asymmetrical relationships mentioned in chapter 2. The last step was to compare the findings among the different groups of asymmetry identified in paragraph 3.4.1. However, there were no difference found between the different groups as explained in chapter 5.

The derivation of conceptual insight from coded process data can be particularly challenging, due to its complexity (Bizzi & Langley, 2012). In order to conduct this task, Langley (1999) proposed seven different strategies: narrative, quantification, alternate templates, visual mapping, temporal bracketing, synthetic and grounded theory. As it is not the purpose of the study to discuss each of these strategies exhaustively, only the ones that will be chosen are further elaborated. In the first place, visual mapping is used to represent the processes. Visual mapping involves the illustration of processes using tables, flow-charts and other visual displays (Bizzi & Langley, 2012; Halinen & Törnroos, 2005). In this research, visual mapping is used to show the link between the relationship development phases and the relationship-specific management tasks analyzed in step three for each relationship. In addition, in this figure the driver of change is included. The visual mapping is complemented with the temporal bracketing strategy which entails the comparison of distinct time periods (Bizzi & Langley, 2012). In this case, the figures developed for the visual mapping strategy are supported by a verbal

account. Without verbal clarification of the created time line and network pictures will not reveal all nuances of the network development. For this reason, the presentation of the development of the relationships over time and the associated management activities will be explained based on citations from the interviews. The richness of detail that can be provided by a verbal account will contribute to the credibility and interest of the analysis (Bizzi & Langley, 2012). This explanation will be organized according to the phases of relationship development. In such a way, the relationship management tasks can be compared over the different phases of relationship development.

The two strategies are also used to illustrate the context of this research. In the first paragraph of chapter 4, a time line will be constructed that includes the key events regarding the development of the artificial pancreas at the SME. In addition, multiple network picture(s) are taken that are attached to the time line. Network pictures can be defined, following Ford and Snehota (2000, p. 5), as views of the extent, content, and characteristics of the network held by the participants in that network. A network picture will be taken from the perspective of the two owners of the innovative SME at the point in time when a new prototype was developed, because at these moments the development of the artificial pancreas made a significant step forward. In the end, the time line combined with the relationship-specific management tasks explained by a narrative results in a framework that SMEs can use to manage its asymmetrical relationships over time. For this purpose, in this research the visual mapping and temporal bracketing are combined to analyze and interpret the data collected. In this way, the strategies' unique strengths are united to overcome their weaknesses.

### **3.7 Conclusion**

In conclusion, in this study a process research approach is taken to research how the innovative SME manages its six asymmetrical IORs over time. For this purpose, several methods from case study research were adopted. Firstly, it was chosen to combine a retrospective research design with a longitudinal one to handle the trade-offs of both. Secondly, the research design focuses on the dyadic level to avoid oversimplification. Thirdly, the findings of the study are respectively compared with theory and across the different IORs of the SME to ensure internal and external validity. Fourthly, semi-structured interviews, passive observations, and archival data are used in combination to improve construct validity. Lastly, two data analysis strategies – visual mapping and temporal bracketing – are used to capture all the gathered data in all its richness. In the next chapter, these two strategies are used to present the findings of this study.

## 4 Findings

### 4.1 Presentation of the innovative SME, the innovation project, and the network

In figure 4 a brief history of the innovative SME and the development of its network is presented. In 2003, the inventor paid a visit to his diabetes nurse for his yearly check up. Afterwards he was convinced that there should be a better treatment for his disease. That evening he invented a new system to treat diabetes: a bihormonal artificial pancreas (AP). The main principle of the system is the automatic administration of both insulin and glucagon while the glucose level of the patient is continuously monitored. This principle is innovative, because it includes automatic administration of both hormones while existing diabetes treatments still require human administration. In addition, it uses glucagon as a means to control the glucose level of the patient instead of only using it as a last resort. In order to develop a first prototype of the system, the inventor sought the assistance of two his friends. One had the expertise in software development, whereas the other, had knowledge about the needs of diabetics and current diabetes treatments.

In 2004, the first prototype (appendix 8.7) with the size of small closet was ready and the inventor could test it himself. In collaboration with a local hospital, they were able to test the device on a few more diabetics. The findings of the experiment were promising for further development, and they developed a second prototype with the size of a micro-oven (appendix 8.7). However, the local hospital did not have the capabilities to take the risks of setting up official clinical trials. Since the friends were unable to find an organization to start official clinical trials, the innovation project was hold up between 2006 and 2008. In the meanwhile, the inventor and his wife had dinner with a befriended couple. During the dinner the man of the couple, an informal investor, offered to see if he could be of assistance in finding the right partners to bring the project forward again.

Based on an article in magazine for diabetes patients, the inventor came into contact with a physician specialized in diabetes. Regrettably, he did not have an interest in the techniques behind diabetes treatment. However, he got the inventor in touch with a physician working for an academic hospital. Together with the informal investor, the inventor convinced him to set up clinical trials. In order to cover the costs of the clinical trials the academic hospital wanted some shares in return. Up till now, there was no business around this project. Hence, in 2008 a new business was established. In 2010 and 2011, the first clinical trials with the second prototype were carried out by a PhD student of the academic hospital. The results of the trials were reason to take the development of the artificial pancreas a step further, and a system with the size of a large laptop was developed (appendix 8.7).

In the meantime, the inventor got in touch with a health foundation for diabetes. The organization appeared to have a large network of organizations that were involved in diabetes research. In 2010, the health fund organized a meeting with several organizations aiming to find a solution for the measurement inaccuracy of sensors. At the meeting an independent research institute was present that had ideas about the working principle of a new sensor. Soon after the meeting, the two organizations started a three year research project to develop this new sensor. Also the members of the diabetes health fund were enthusiastic about the new system and the SME won the audience award of the fund in 2012. Winning the award gave the business a lot of media attention. It also grabbed the attention of one of the market leaders in the medical devices market which resulted in an early cooperation.

In the same year, the SME and the academic medical center started an European research project funded by the EC under the Seventh Framework Programme for Research and Technological Development. The project involves seven organizations most of them from another project carried out by the academic hospital. The project is crucial for the further technological development of the artificial pancreas . Although the project is incredibly valuable for the technical development of the device, the organization recognizes that it should also consider the market in an early stage. For this purpose, they recently applied for a subsidy from the Dutch government for a project that focuses on the market side of the innovation project. In the meanwhile, the SME is developing a fourth prototype which is the size of a modern mobile phone (appendix 8.7).

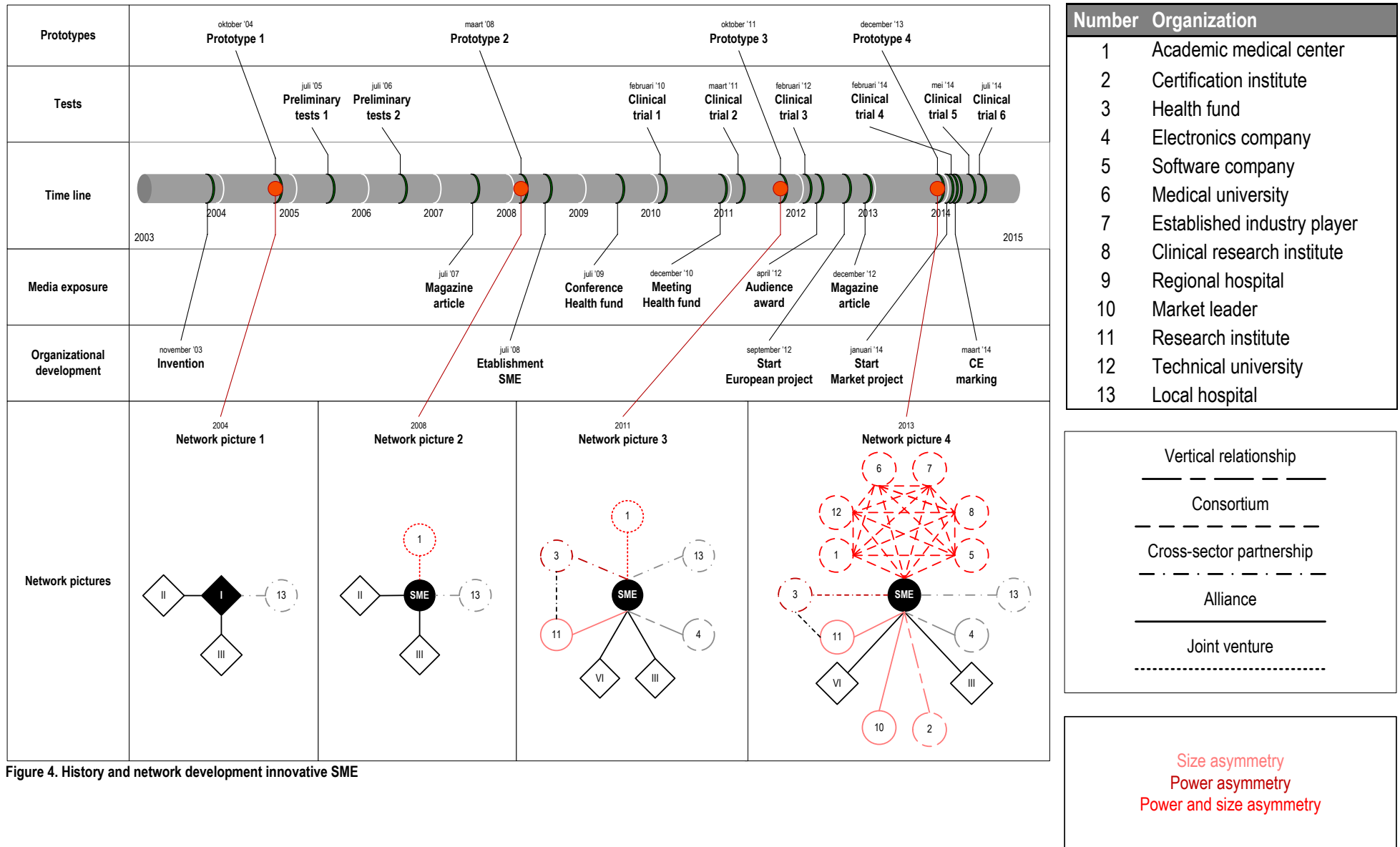


Figure 4. History and network development innovative SME

In conclusion, the project to develop an artificial pancreas arose from the dissatisfaction of a diabetes patient with his treatment. With the support of his personal network, he was able to develop and test the first prototype. It proved to be difficult to get the attention of a partner that was able to bring the project a step forward. Although the project by no means has reached its end, the professional network of organizations that was developed along the road is meant to bring the business closer to its goal. The tasks to manage these IORs identified in the literature were surveyed to determine the tasks used by the case firm, as well as their evolution, based on information from the business and its network members. Each of the relationships of the SME followed a sequence of identification, negotiation, agreement, and operation. For the purpose of readability the relationship specific tasks are divided in these four phases. Firstly, a brief description of the activities in the respective phase is given. Secondly, the tasks executed to manage their asymmetric relationships in the phase are discussed. And last, the driver of the respective phase to the next is analyzed. In figures 5 till 10, an overview of the tasks carried out per phase in the respective relationship is presented.

## 4.2 The identification phase

In the identification phase, either the SME approached a potential partner or the business was contacted by an organization that would like to cooperate. The first contact was established, and the potential partners became aware that there was a basis for cooperation. This was facilitated by two relationship-specific management tasks, namely public exposure and prior relations.

### 4.2.1 Relationship-specific tasks in the identification phase

As presented in figure 9, the academic medical center was identified via prior relations and external information sources. When the inventor was looking for a partner for the clinical trials, the inventor published the results of the first tests in a diabetes magazine. This got him in touch with a physician specialized in diabetes. Although he was not willing to conduct the trials, he referred the inventor to the academic hospital. As shown in figure 5 till 10, also the other partners were identified in one of these ways. The SME came into contact with the health foundation at a donor meeting. As the head of knowledge and research recalled, the inventor *“was at a donor meeting that we organized. There I got involved in a conversation with him. He told me what he was doing and what he had developed. Then we arranged a meeting, and he showed us what he had developed.”*<sup>3</sup> The health fund later invited the SME to a meeting where it met the research organization. Moreover, the SME was approached by one of the market leaders based on the media exposure from winning the audience award of the health foundation. In contrast, the partners in the European research project were identified via existing relations. Three of them were collaborating with the academic hospital in another project. The other two were personal relations from the informal investor of the SME. He had a long term friendship with a key individual in both these organizations that grew into IORs with the start of the European project. All in all, public exposure and referrals from prior relations formed the basis for partner identification by the SME.

### 4.2.2 Driver of change to the negotiation phase

The relationship reached the next phase when both partners recognized that by cooperating they could reach goals that would be difficult to achieve or may not be achieved without the other. As shown in the figure 7, the relationship with the research institute reached the negotiation phase when the SME acknowledged that the research institute had the necessary knowledge to solve the measurement inaccuracy of their current sensors. As the SME manager of the research institute explains *“you get in touch, because we had the ideas about how such a measurement could be executed. Via the health foundation we did know that the SME was looking for an improvement of what they have now.”*<sup>4</sup> Also in the relationship with the academic medical center, see figure 9, there were complementary goals and resources. On the one hand, the SME needed clinical trials to prove the working principle of the artificial pancreas, but it lacked financial resources and required knowledge to set these up. On the other hand, the academic medical center aims to research the efficiency and effectiveness of medical devices, but it lacks the technical capabilities to develop them. The informal investor explained *“you see that in the European project as well... The established industry player wants to develop glucagon. However, they need us for testing, but they can do that under their own control. In this way, you have all these parties that are*

<sup>3</sup> Translation from Dutch, the original citation is: *“was ooit op een donateurbijeenkomst die wij organiseren. Toen ben ik met hem aan de praat geraakt, en toen vertelde hij mee bezig was en wat hij zelf allemaal had ontwikkeld. Toen is hij een keertje naar ons toegekomen, heeft hij laten zien wat hij ontwikkeld.”*

<sup>4</sup> Translation from Dutch, the original citation is: *“Eerst is het natuurlijk zo dat je in contact komt, omdat wij ideeën hadden over hoe zo'n meting zou plaats kunnen vinden. Via het gezondheidsfonds wisten we dat de SME opzoek was naar een verbetering van wat ze nu hebben.”*



*dependent on each other, but they can achieve success in their own field... You can realize your own goals better together than apart, but you do not have the same goals which results in a win-lose situation.*<sup>5</sup> Thus, the partners had mutually beneficial goals that could be better attained by combining their complementary resources than by doing it alone. In this way, both partners would benefit from dealing with each other. Therefore, the partners entered the negotiation phase to seek agreement about the design of the relationship.

### 4.3 The negotiation phase

In the negotiation phase the SME and its partners developed a joint understanding of the nature of the relationship through a series of interactions. In this phase, the partners persuaded, argued, and haggled over possible rights and duties, and benefits and burdens of the potential relationship. During this bargaining process, two main relationship-specific tasks were carried out: partner attraction and selection.

#### 4.3.1 Relationship-specific tasks in the negotiation phase

In the negotiation phase, the SME attracted the potential partner by convincing it of the benefits of cooperation. Most partners indicated that the good functioning and looking prototypes and positive test results were the prime reason to cooperate. As the market leader indicated (column two of figure 8): *“Once we organized a meeting in our head quarter, and they showed us their concept. The technicians thought they were already further with the development they had expected. So, that is how the relation was initiated.”*<sup>6</sup> As presented in for example column two of figure 7, financial means and network access formed other the compelling reasons to collaborate. For example, the research institute said *“that the informal investor has the necessary means, the connections they have with the diabetes health fund, the market leader and within the European project. Then we say that is sufficient to go through with it.”*<sup>7</sup> In conclusion, the product performance, financial resources and network access were the most important factors that attracted potential partners.

At the same time, the SME had to decide if the initial agreements are reason to continue the relationship. In the beginning, the business did not have much choice. As the inventor said: *“In the beginning you just take the opportunities you get. Partners present themselves and you just pick them. You do not have anything to choose; ‘take it, or leave it’. If we do not accept them, we cannot continue. Thus, we have to.”*<sup>8</sup> The SME had more selection opportunities when the network grew larger. In these cases, the SME mentioned fit to the project, potential conflicts among two parties, resources of the potential partner or positive experiences from other partners as selection criteria. Case by case the business assessed the situation and a decision was made to collaborate or not. Regularly, the decision was based on the gut feeling of the inventor. In most relationships this turned out well, but in the case of the health foundation it resulted in difficulties. It appeared that the physician of the academic hospital and the members of the assessment committee of the health fund were not a good match on a personal level. The inventor explained that the health foundation and the academic hospital are *“water and fire. That was not a smart choice... If they do not like each other, than they oppose each other whenever they have the chance... Therefore, the project of the physician of the academic medical center was rejected by the diabetes health fund, purely personal. Of course, that is not communicated to the outside, but meanwhile a negative advice is given.”*<sup>9</sup> This was further complicated because the health foundation normally does not fund commercial organizations. Consequently, applications for funding from the health foundation were rejected and it took a considerable amount of time before the partners found a way in which the diabetes health fund could finance the innovation project. In short, the informal selection process did not always have the desired result.

---

<sup>5</sup> Translation from Dutch, the original citation is: *“Dat zie je in het Europese project ook wel... De gevestigde industrieel wil gewoon glucagon ontwikkelen. Daar heb ze ons wel bij nodig om te testen, ze kunnen dat onder hun eigen regie. Zo heb je eigenlijk al die partijen die zijn afhankelijk van elkaar, maar kunnen we op hun eigen gebied successen boeken... Je kan je eigen doelstellingen samen beter realiseren dan apart. Maar je hebt niet dezelfde doelen dat je in de win-lose situatie komt.”*

<sup>6</sup> Translation from Dutch, the original citation is: *“Maar goed toen hebben we een keer een meeting georganiseerd in het hoofdkwartier, en hebben ze het concept laten. Daar hadden de technologie mensen ook wel zoiets van die zijn al verder dan we gedacht hadden. Dus zo is dat contact tot stand gekomen.”*

<sup>7</sup> Translation from Dutch, the original citation is: *“Ja, en nogmaals het feit dat de informele investeerder over de nodige middelen beschikt, de connecties met het Diabetes Fonds en de markt lijder en die ze hebben in het EU project. Dan zeggen we dat dit voldoende is om er in te stappen.”*

<sup>8</sup> Translation from Dutch, the original citation is: *“In het begin pak je gewoon de kansen die je krijgt. Er dienen zich partners aan en je kiest gewoon. Dan heb je niks te kiezen, dan moet je gewoon slikken. Ja, als we het niet doen dan komen we niet verder dus we moeten wel.”*

<sup>9</sup> Translation from Dutch, the original citation is *“water en vuur. Dat is dus niet een heel slimme keus... En als ze elkaar niet mogen, dan werken ze elkaar overal tegen... Daarom is het project van de arts binnen de commissie van het Diabetes Fonds afgewezen, puur persoonlijk. Dat wordt natuurlijk niet naar buiten gezegd, maar ondertussen wordt een negatief advies gegeven, punt.”*

### 4.3.2 Driver of change to the agreement phase

As presented in figure 5 till 10, the relationship reached the agreement phase when both partners were confident about the other partner's trust worthiness in terms of performance and/or potential opportunistic behavior. As indicated in figure 7 and explained by the research institute *"there must be a sense of mutual understanding. The inventor should have confidence in the feasibility of the ideas of our technicians... there should be a certain feeling that the intended outcomes will be achieved. That it is a good idea that meets the needs of the SME."*<sup>10</sup> After the SME and the research institute were convinced of each other's trustworthiness, the partners started to make a deal about the business aspects of the relationship. Where the relationships with the research institute reached the next phase relatively quickly, the relationship with the health foundation was held up in this phase. The reason for this hold up was that the assessment committee *"was not convinced that this specific project would be more successful than all other projects with the same topic"*<sup>11</sup> based on their experience in the field. As explained in the previous paragraph, the decision was also influenced by interpersonal conflicts and established way of working within the health foundation. After four years of negotiating, the partners found a way to circumvent the assessment committee. The SME, health foundation, academic medical center, and technical university are applying for a funding program of the Dutch government with their own assessment committee. This opportunity symbolizes the transition from the negotiation phase to the agreement phase for the relationship between the SME and the health foundation, see figure 10. It should be noted that although the relationship did not reach the next phase, the relationship proved valuable for the SME nonetheless. The health foundation gave referrals to potential partners and ensured public exposure for the SME. In sum, a sense of mutual trust was established before the bargaining process about formal agreements was initiated.

## 4.4 The agreement phase

In the agreement phase, the SME and their partner reached an agreement about the terms, obligations, rules, and governance structure of the relationship during a series of meetings. The partners committed to the agreements agreed by formalizing them. As shown in figure 5 till 10, the SME created formal communication mechanisms with their partner to accomplish this.

### 4.4.1 Relationship-specific tasks in the agreement phase

In the first place, the SME signed a Non-Disclosure Agreement (NDA) with all its partners. Although the NDA ensured that the knowledge from the SME was protected, it was also important to increase the willingness of the partner to exchange knowledge. In turn improving the capability of the SME to learn from its partners. In addition, the business developed wide range of contracts with their partners:

- *Certification institute* (figure 5): In order to get the CE marking of the certification institute the SME could follow two avenues: a single assessment or a trajectory with more guidance. As the experience with certification is limited, the SME preferred the second option. The trajectory to be followed is determined by the institute and includes several review moments to evaluate if the SME is on the right track for CE approval. For this purpose, the business needs to meet explicit requirements. Although the SME can determine how the requirements are filled in, the SME does not have the opportunity to change them once they are final.
- *European project* (figure 6): The grant application required the project partners to meet specific requirements of the EC. The result was a detailed project description, including detailed goal, planning, and budget descriptions and a formal consortium agreement.
- *Research institute* (figure 7): The contract with the research institute was partly influenced by the State Aid Rules, because the project was financed with public funds. The State Aid Rules determined the payment structure. The informal investor explained *"we now have co-financing project in which you have steps from 10, 25, 50, and 100 percent that you have to fund yourself. The steps develop from scientific research to market authorization resulting in the exclusive rights."*<sup>12</sup> The details of the project were filled in jointly, and resulted in a detailed design of the co-development process.

---

<sup>10</sup> Translation from Dutch, the original citation is: *"Daar moet een soort chemie ontstaan dat ze elkaar begrijpen, en dat the uitvinder een bepaald vertrouwen heeft dat het verhaal van de technische man enigszins haalbaar is... Maar eerst toch wel degelijk dat er een bepaald gevoel moet komen dat de uitkomst wel goed gaat komen. Dat er een goed idee is dat aansluit op de behoefte van de SME."*

<sup>11</sup> Translation from Dutch, the original citation is: *"er niet van overtuigd dat dit specifieke project het zou halen met alle andere projecten die ook mikken op dat onderwerp"*

<sup>12</sup> Translation from Dutch, the original citation is: *"We hebben nu een co-fi traject. Daarmee heb je stapjes 10, 25, 50, 100 procent wat je zelf moet betalen. Dat gaat van wetenschappelijk onderzoek naar markttoelating, waarbij je de exclusieve rechten krijgt."*

- Market leader (figure 8): With the market leader the SME has a Right of First Refusal (RFR) that gives the market leader the option to enter a business transaction with the SME before the owner can enter into that transaction with another organization.
- Academic medical center (figure 9). In exchange for the clinical trials conducted by the academic hospital, the hospital asked ten percent of the shares of the SME. This agreement ensured that the academic hospital would be incentivized to carry out the clinical trials. In the words of the inventor the SME is only 'a drop in the ocean' while the clinical trials are essential for further development.
- Health foundation (figure 10). Thirdly, previously there were no formal agreements between the SME and the health fund. Only currently they reached an agreement about a collaboration in the form of a project funded by government subsidy. As the project shows close similarities with the European project, the structural specifications of the contract are similar to the European project.

In conclusion, in the negotiation phase the task of the SME was to establish a contract defining the goals of the partnership, the incentive system and other structural specifications.

#### 4.4.2 Driver of change to the operation phase

Once the agreements are codified into a contract, the relationships move into the operation phase. As shown in figure 5 till 10, the SME and its partner all reached an agreement that was codified into a contract. The SME formalized every agreement to reduce the relational and performance risks associated with relationships. The SME only signed the contract when it was confident that these risks were sufficiently covered. In other words, the SME needed to be certain that the chance that the partner would act opportunistically was reduced and the payoffs of the would be equally divided. In addition, it needed to be confident that the goals specified in the contract will be actually be achieved. When the contract was signed the commitments and rules of action could be carried out in effect. Nonetheless, a partnership can still fail at this point. In 2012, the SME and a potential investor almost signed a contract. However, the investor changed the initial agreements by lowering the investment, because the patent applications of the SME were still pending at that moment. The SME rejected the offering, because it perceived to be treated unfairly. Thus, before entering the operation phase two partners reached an agreement about the terms, obligations, rules, and governance structure of the relationship which were codified into a contract subsequently. So, the signature on the contract between the partners symbolizes the start of the operation phase.

### 4.5 The operation phase

During the operation phase, the partners implement all agreements of the partnership, e.g. knowledge is exchanged, research is carried out, parts are developed, clinical trials are conducted, the amounts agreed upon are paid. At the same time, the agreements reached between the SME and its partner in the previous phase provide the foundation for monitoring the outcomes of the joint undertaking and the behavior of the partner four relationship-specific tasks were carried out in this phase:

#### 4.5.1 Relationship-specific tasks in the operation phase

Firstly, the SME recognized that the formal contracts do not result automatically in exchange of knowledge and resources. Therefore, informal communication mechanisms were established. As presented in figure 5 till 10, the informal activities observed were face-to-face meetings, e-mail and telephone contact, transfer of staff, coffee talk, social events and conferences. The first two were present in every relationship, the latter were only visible in relationships with a high interdependence between the partners. The degree of interdependence differed between the partnerships. The SME and the market leader are according to the inventor *"just cuddling. Let's put it that way. The underlying rationale is that they want more if it is successful, but not yet in this phase."*<sup>13</sup> While the informal investor told that the research institute *"actually does a part of the research. Until today, we always brought in the knowledge, but they also transfer know-how to us."*<sup>14</sup> The partners indicated that for a high level of exchange the additional informal communication mechanisms, especially the transfer of staff, were essential. From the academic medical center and the technical university people are physically working at the SME. As the department director of university said *'in terms of exchange is it simply being at location... In this way, the*

<sup>13</sup> Translation from Dutch, the original citation is: *"een beetje knuffelen met elkaar laten we het zo noemen. Maar goed de onderliggende zin, dat ze eigenlijk als het succesvol is dat ze wel wat meer willen. Maar nog niet in deze fase."*

<sup>14</sup> Translation from Dutch, the original citation is: *"Ja, zij doen echt een stuk onderzoek. Tot nu toe waren wij altijd degene die de kennis meenamen, maar nu brengen zij ook echt knowhow naar ons"*

exchange is for a large part warranted.”<sup>15</sup> The research institute is, in the next stage of the relationship, “a proponent, if that is a possibility, of things happening in one place. That someone comes physically to us initially. Than is presence, and rigging up something together, the most powerful way to exchange knowledge.”<sup>16</sup> In other words, when the relationship was characterized by a high level of interdependence, the SME had developed additional informal communication mechanisms to support exchange between the partners. It should be noted, however, that this does not mean that increasing the amount and changing the type of informal communication necessarily results in a better relationship performance. The partners indicated that it is important to find the right balance between electronic and face-to-face contact. For this purpose, the advantages of face-to-face contact have to be weighted with its costs and a deliberate choice should be made for the informal communication mechanisms to be used. When the right communication activities were chosen, the mechanisms gave the SME the opportunity to learn from the partners. Indeed the SME owner believed that *‘the knowledge you do not have, you have to acquire.’*<sup>17</sup> However, multiple partners stated that they have knowledge, expertise or resources that may be valuable in the innovation project which the SME has no knowledge of or does not use. As the director of a department of the university explained *‘they have far too little appreciation for the knowledge of the academic medical center about the market and treatment of diabetes... I think they should make much more use of it.’*<sup>18</sup> In conclusion, the SME established mechanisms that could increase the exchange of knowledge, but the actual search for and application of the knowledge, expertise and resources from partners was limited.

Secondly, the SME showed their accomplishments to the partner to build trust (see figure 5 till 10). The first PhD student told that the SME “needs to prove itself again and again... only then they take you seriously.”<sup>19</sup> For this purpose, the informal communication mechanisms explained in the previous part are crucial. The inventor explains that face-to-face meetings are important, because “only then you can really show what you have got. Then you see what you have accomplished in six months time.”<sup>20</sup> At the same time, showing off its achievements also motivated the SME’s partners to put effort into the joint project. According to the SME partner motivation is an essential part of relationship management, because in large organizations the employees involved in the collaboration are often not directly responsible for its success. This phenomenon could be seen especially in organizations involved in government funded research projects. In government funded projects there is often not a direct customer. The SME manager of the research institute told *‘than you can just do research according to plan. Of course, there is a European Commission that requires that the plan is implemented. However, there is nobody that is knocking on your door because you are too late or because it does not work... On the other hand with large companies you have a totally different culture. Sometimes the involved employees of a company are less committed, because it is not their own money.’*<sup>21</sup> All in all, the SME needs to demonstrate their achievements to create trust in their capabilities and motivate their partner to do their job.

Thirdly, the SME monitored the progress within the relationship. When the dependence on the other partner was low, the SME did not put effort in monitoring the performance of the relationship or partner (see figure 8). However, in the case of for example the academic medical center the SME is dependent on the outcomes of their partner. As the informal investor explained *‘they (academic medical center) carry out the clinical trials by which we can improve the system... they cannot study science when they do not have a device and the other way around.’*<sup>22</sup> Thus, they closely kept track of the partner’s progress to avoid problems as much as possible. According to the inventor *‘you agree with people when it has to be finished. Generally, you are both too optimistic. You can make that very complicated and put people under pressure, but then you have a bad product on time. I*

<sup>15</sup> Translation from Dutch, the original citation is: *“qua uitwisselingen is het gewoon meer op locatie zijn. Ik bedoel daarvan zie ik dat jij en iemand van het AMC het platteland optrekt. Daarmee is het voor een groot deel gewaarborgd.”*

<sup>16</sup> Translation from Dutch, the original citation is: *“Op zich zou ik een voorstander zijn, als dat een mogelijkheid is dat op een of andere manier toch dingen op één plek gebeuren. Dat er iemand fysiek misschien dan toch in eerste instantie naar ons komt. Dan is aanwezigheid, en samen ergens aan knutselen toch wel de meest krachtige manier om de kennis over te dragen.”*

<sup>17</sup> Translation from Dutch, the original citation is: *“kennis die je zelf niet hebt, die moet je wel binnenhalen.”*

<sup>18</sup> Translation from Dutch, the original citation is: *“Ze hebben veel te weinig waardering over de kennis die er bij het AMC is voor de hele markt en van de hele behandeling van diabetes... Ik denk dat ze daar veel meer gebruik van moeten maken.”*

<sup>19</sup> Translation from Dutch, the original citation is: *“Inreda moet zich wel keer op keer bewijzen... en dan nemen ze je pas serieus”*

<sup>20</sup> Translation from Dutch, the original citation is: *“dan kun je echt wat laten zien. Dan zie ze, hé verrek in een half jaar tijd is dat allemaal bereikt.”*

<sup>21</sup> Translation from Dutch, the original citation is: *“dan mag je gewoon onderzoeken en voer je dat plan uit. Natuurlijk is er wel ergens een EU commissie die wil dat je ongeveer het plan uitgevoerd wordt. Maar er staat niet iemand op de deur te kloppen van je bent te laat of het werkt niet... En aan de andere kant ook met grote bedrijven heb je ook weer een heel ander regime daar. Soms zijn daar de betrokken medewerkers van het bedrijf ook minder betrokken, omdat het ook niet hun eigen geld is.”*

<sup>22</sup> Translation from Dutch, the original citation is: *“Zij zeggen dan aan de andere kant dat zij de trails doen, waar wij het apparaat mee kunnen verbeteren. Dan heb je eigenlijk samenwerking, want zij kunnen geen wetenschap bedrijven of testen doen als zij geen apparaat hebben. En wij andersom niet.”*

prefer to have a good product instead... You have to accept that people are longer busy with something, because they want it to be good. It should not get out of hand, however. At a certain moment you have to say: 'you should finish now, you took enough time'.<sup>23</sup> In this task, the SME has a strong focus on the effort of the partner. As the inventor further explains: "if you are too late, and you took three weeks of holiday then it is a different story. Then you are late, because you did not go for it. However, if you have shown full commitment and worked hard you tried to develop a good end product."<sup>24</sup> In the European project the focus on quality and effort resulted in considerable delays. The sixth clinical trial was initially planned for spring 2013, but now the trial will hopefully take place in the first months of 2014. The reason for this delay is that the business did not finish the fourth prototype on time. In conclusion, the SME assessed their partners mainly on the quality of the end result and the effort of the partner, while it was less concerned about potential delays.

Fourthly, the SME resolved conflicts when they occurred. As shown in figures 7 and 9, in the relationship with the academic medical center and the research institute the SME was in the position to monitor the progress of the relationship and the partners, and react to the findings by steering the relationship in the right direction. When there were disputes the partners tried to find a joint solution to the problem. In the European project the responsibility for conflict resolution was not with the SME, but with the project leader from the academic medical center (see figure 9). If they encountered problems they should raise the issue with the project leader. The project leader would then discuss the matter with the partner in question. This brought some difficulties during the project, because the project leader had a long working tradition with several of the partners. When the SME was not pleased with the progress of a project partner, the project leader did not always pass the issue to that partner. According to the employees of the SME the reason for this is his hidden agenda. The project leader seemed to be afraid that raising the issue with the partner would offend them so much that they would not be willing to do their best for the other projects. Therefore, sometimes the SME "let the cat out of the bag" during the monthly teleconference. The inventor explained: "I prefer to do that in public, because then they cannot get away with it and have to act just then. Otherwise, it happens indirectly, and the subject is dropped."<sup>25</sup> In summary, in the project the SME was sometimes unable to take the actions that were in their view necessary to keep the project on track. Otherwise, it used joint resolution as the prime manner to solve conflicts.

#### 4.5.2 Driver of change to the negotiation phase

In time internal and external factors provided cause in some of the relationships to rethink the terms of the relationship. Either because of opportunities to bring the collaboration to a higher level or conflicts that inhibited the execution of the relationship agreements, the relationship between the SME and its partner went into the negotiation phase again. As presented in figure 9, the academic medical center and the SME entered the negotiation phase again when the opportunity arose to apply for EU funding. New agreements were reached between them and the other partners in the project that met the requirements of the EC. As shown in figure 7, the research institute wants to involve the SME in one of their multiple party research programs. However, the conditions of the research program are quite different. It would enable the SME to divide the costs of the project among multiple project members, but all members will be entitled to use the patent without paying a license fee. For that reason, the SME hesitates to become involved. First the SME wants that exclusive rights to the patent are guaranteed. In these bargains the SME is the powerful negotiator. The research institute is obliged to comply with the current contract as long as the SME does not agree to suspend it, while it desperately needs the business' expertise in the research program to ensure its success. The re-negotiations now take about half a year, and since that time the progress of the joint project is slowed down. Thus, a change in the level of interdependence between the partners caused an inter-partner conflict that made it necessary to renegotiate the terms of the relationship delaying the joint project. In figure 8 the slight transparency of the arrow indicates that the relationship between the SME and the market leader is expected to change as well. At this stage joint development would slow down the innovation process due to market leader's internal bureaucracy. However,

<sup>23</sup> Translation from Dutch, the original citation is: "Je spreekt met mensen af wanneer het klaar moet zijn. Je hebt meestal van beide kanten dat je te optimistisch bent. Dus daar kun je daar heel ingewikkeld over doen, en mensen onder druk en stress zetten. Maar dan heb je op tijd een niet goed product, maar ik heb liever iets later een goed product... je moet dan toch accepteren dat mensen niet langer met dingen bezig omdat zij het ook goed willen doen. Het moet ook niet te. Op gegeven moment moet je zeggen nu moet ook af, je bent nu ver genoeg."

<sup>24</sup> Translation from Dutch, the original citation is: "Als je te laat bent, en je hebt bijvoorbeeld drie weken vakantie genomen dan denk ik van.. Dat is een ander verhaal. Dan ben te laat omdat je er niet voor bent gaan. Maar als je volle inzet hebt getoond en hard hebt gewerkt, heb je geprobeerd een goed eind product neer te zetten."

<sup>25</sup> Translation from Dutch, the original citation is: "ik doe dat liever in het openbaar, want dan kunnen ze er niet meer onderweg en moeten ze op dat moment acteren. En dat ze het via via doen, en dat ze het weer laten rusten. Dan kan je beter knuppel in het honden hok gooien."

when the next clinical trials show positive results the business would like to become more involved. In that stage the SME becomes more dependent on the market leader for the distribution of the device in the market. In the end, the market leader is expecting to acquire the system from the SME. As the business manager of the market leader puts it *“generally, the product or the business is purchased. That is also in the interest of the business. They do not want to generate extra revenues. Their goal is to develop products; to create value. That value does a business generate by selling it. That is the way it goes.”*<sup>26</sup> The sale of the artificial pancreas to the market leader would result in a far-reaching contract, because the SME is very eager to warrant the availability of the device to diabetics.

#### **4.6 Conclusion**

In this chapter, the findings of the process research conducted at an innovative SME were presented. Firstly, the context of the case was illustrated. Thereafter, the relationship-specific management tasks executed by the SME were described along with the development of its asymmetrical relationships. In task, special attention was paid to the reasons why the relationships evolved from one phase to the next. In the next chapter, the findings are discussed by comparing them with the theory presented in chapter 2 and across the sub-groups of asymmetry proposed in chapter 3.

---

<sup>26</sup> Translation from Dutch, the original citation is: *“ En meestal wordt het product of de firma gekocht. Dat is ook het belang van een firma. Die hebben niet het belang daarbij om nog verder revenues te generen. Hun doel is om producten te ontwikkelen, waarde te creëren en die waarde creëer je door het aan iemand te verkopen. En op die manier gaat het dan meestal.”*

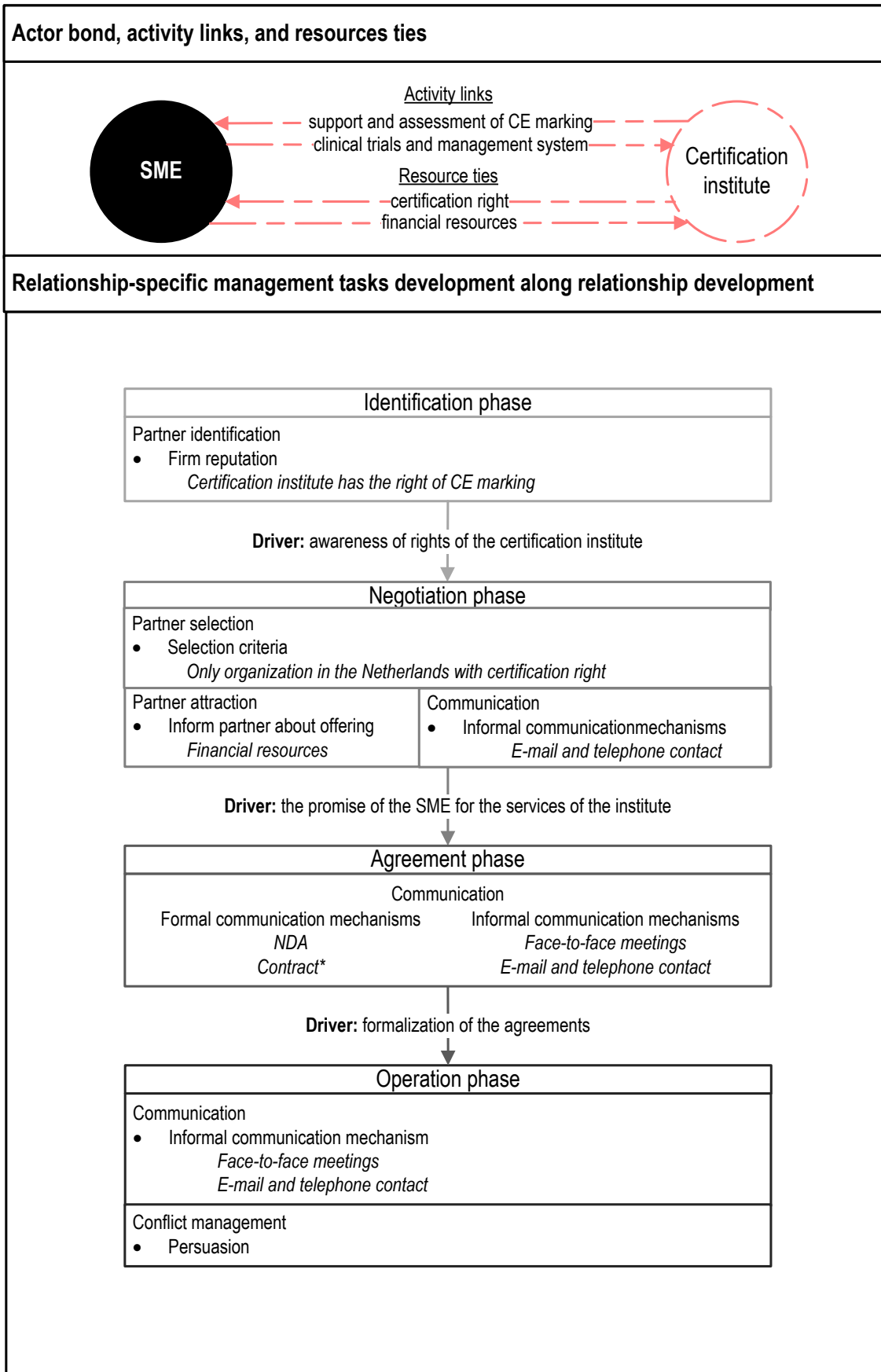


Figure 5. Relationship-specific tasks certification institute over time \*includes goals, incentive system and structural specifications.

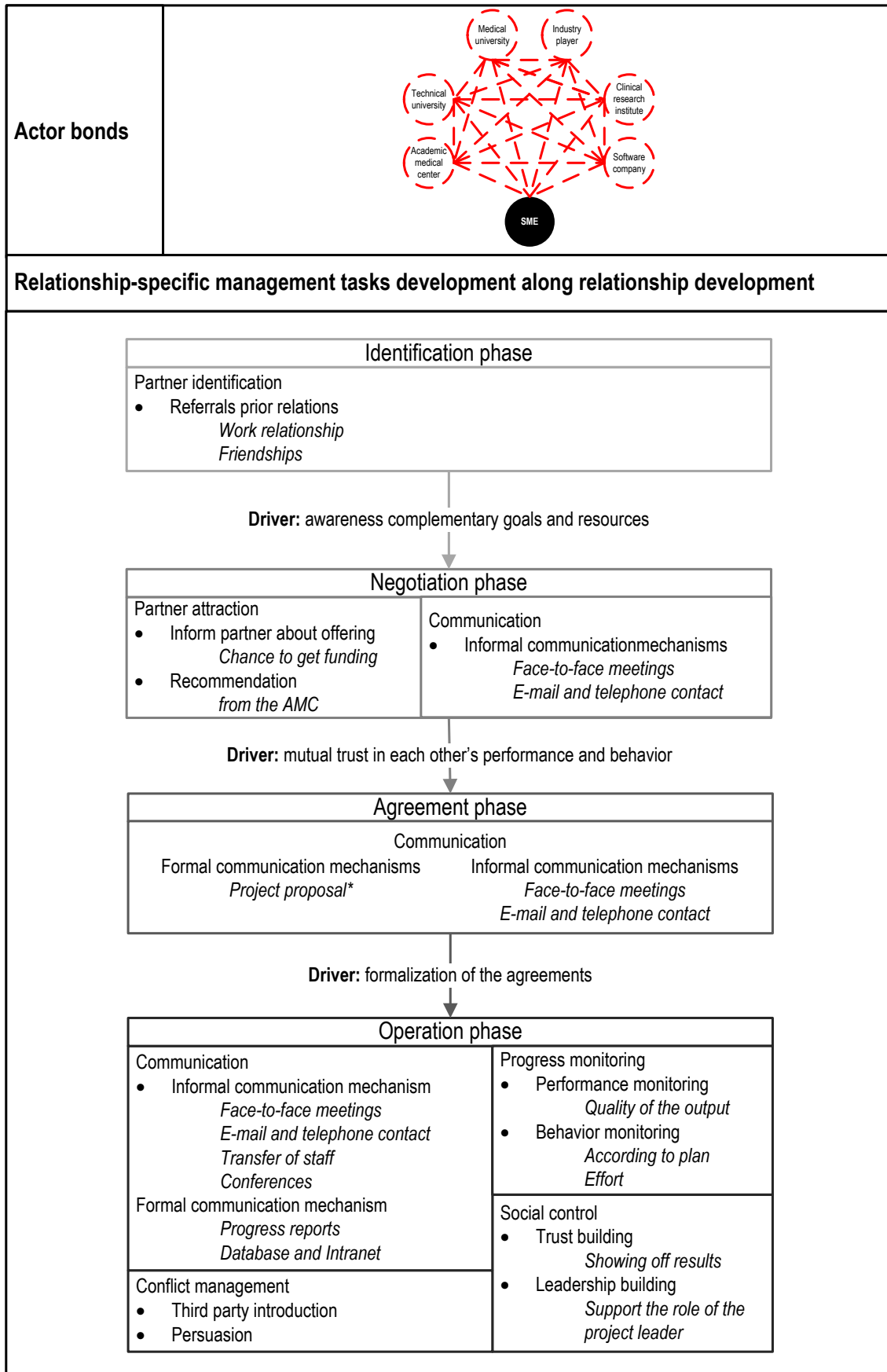


Figure 6. Relationship-specific tasks European project over time \*includes goals, incentive system and structural specifications.



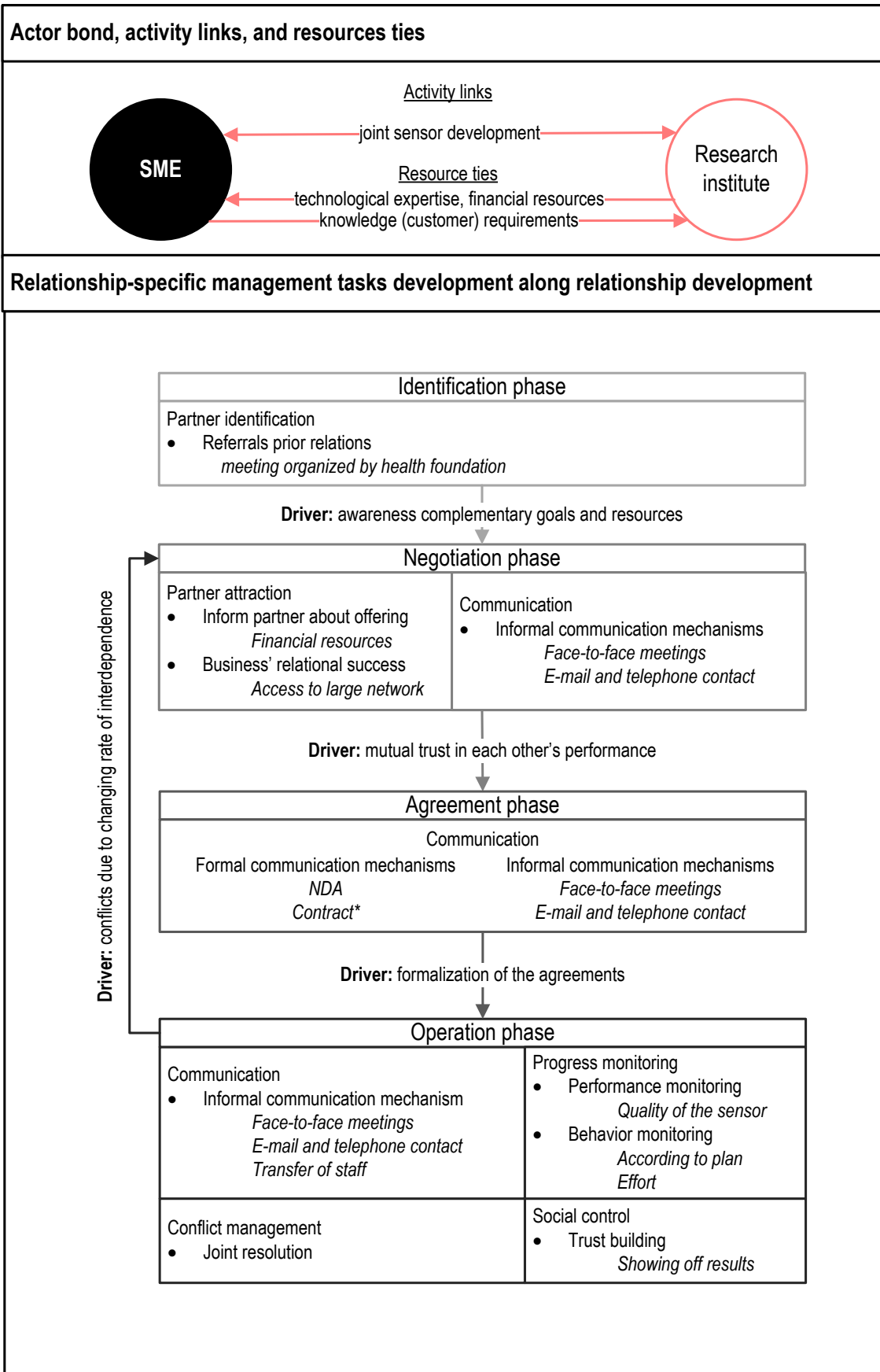


Figure 7. Relationship-specific tasks research institute over time \*includes goals, incentive system and structural specifications.

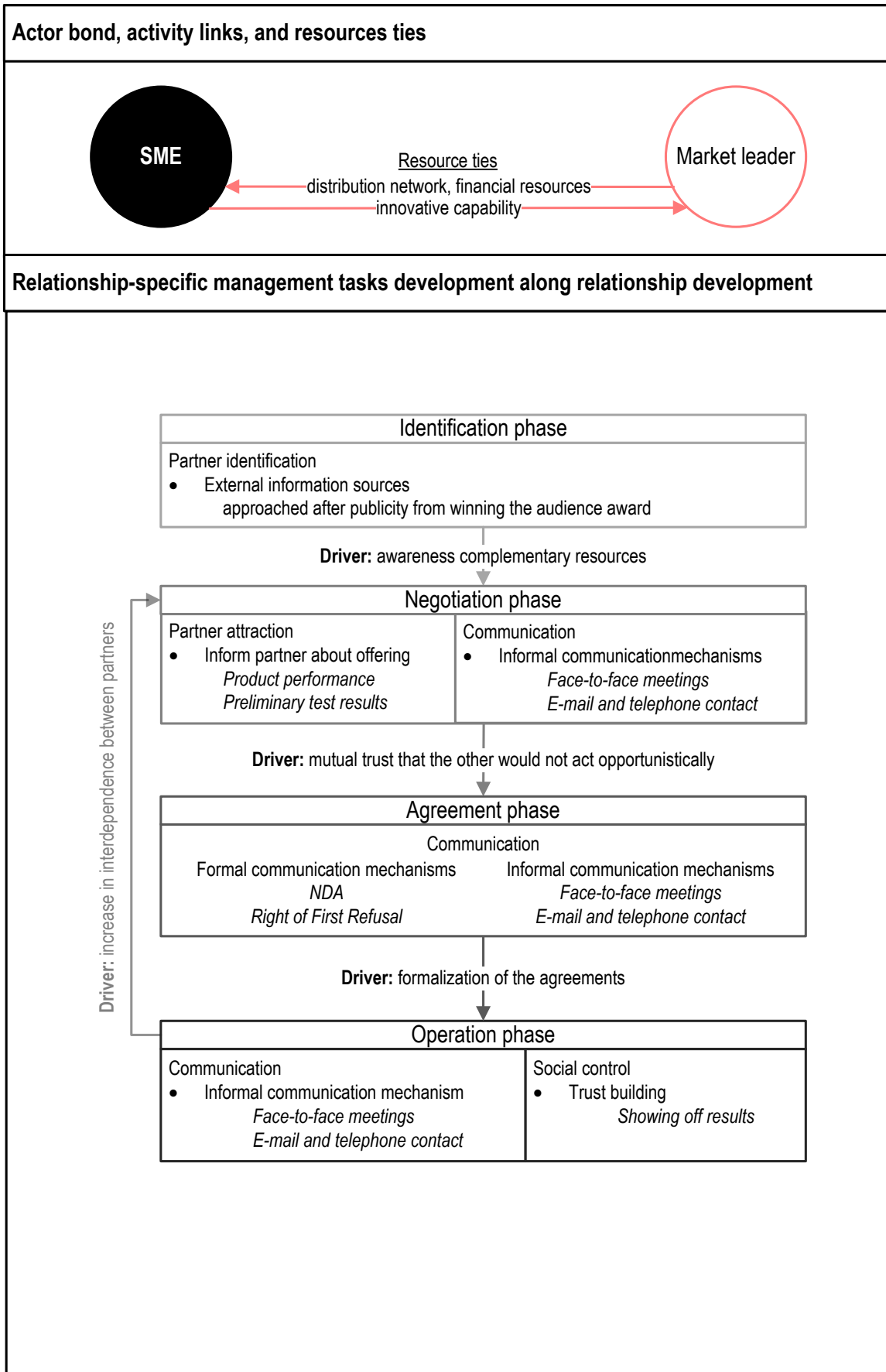


Figure 8. Relationship-specific tasks market leader over time

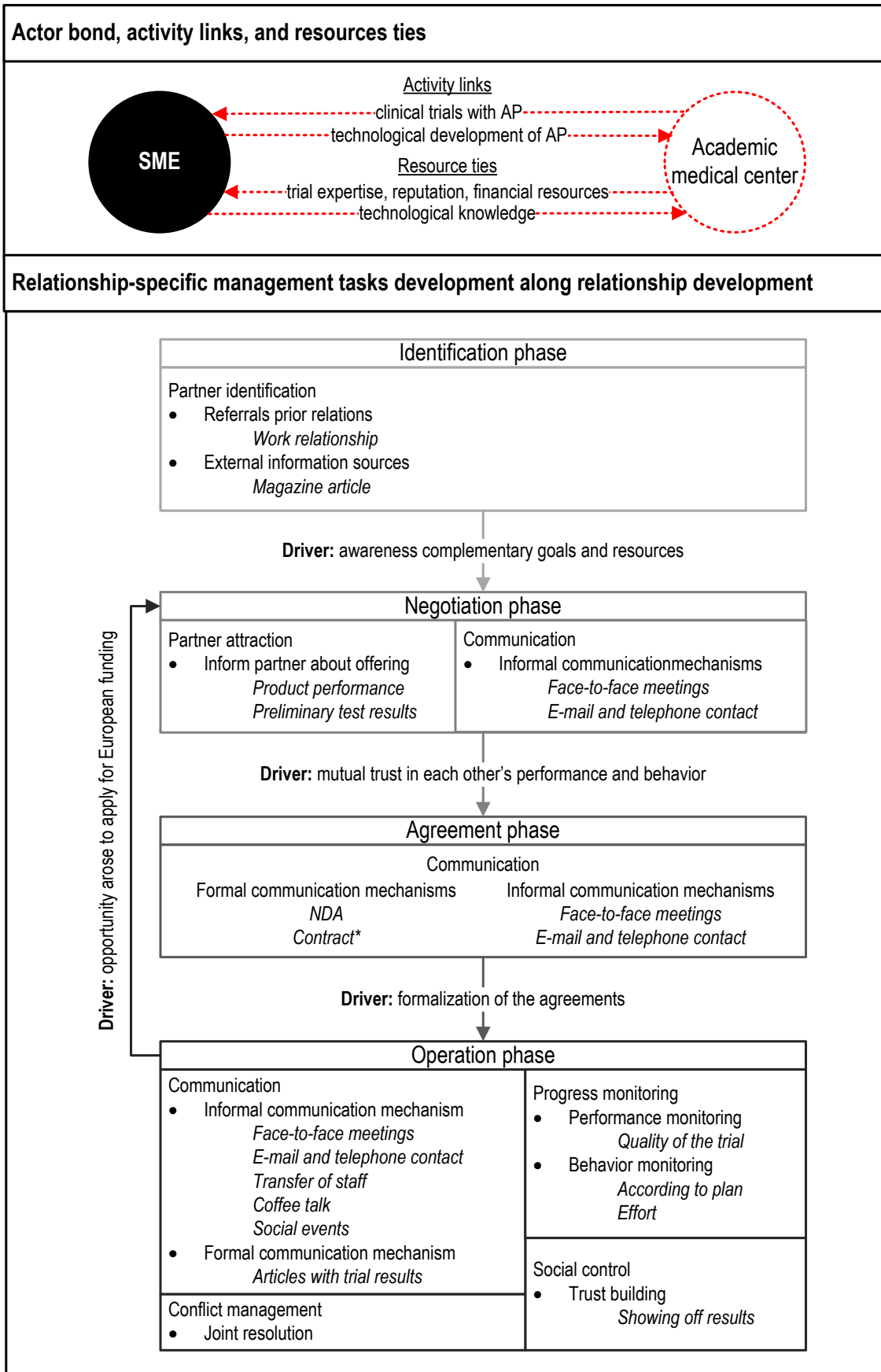


Figure 9. Relationship-specific tasks academic medical center over time \*includes goals, incentive system and structural specifications.

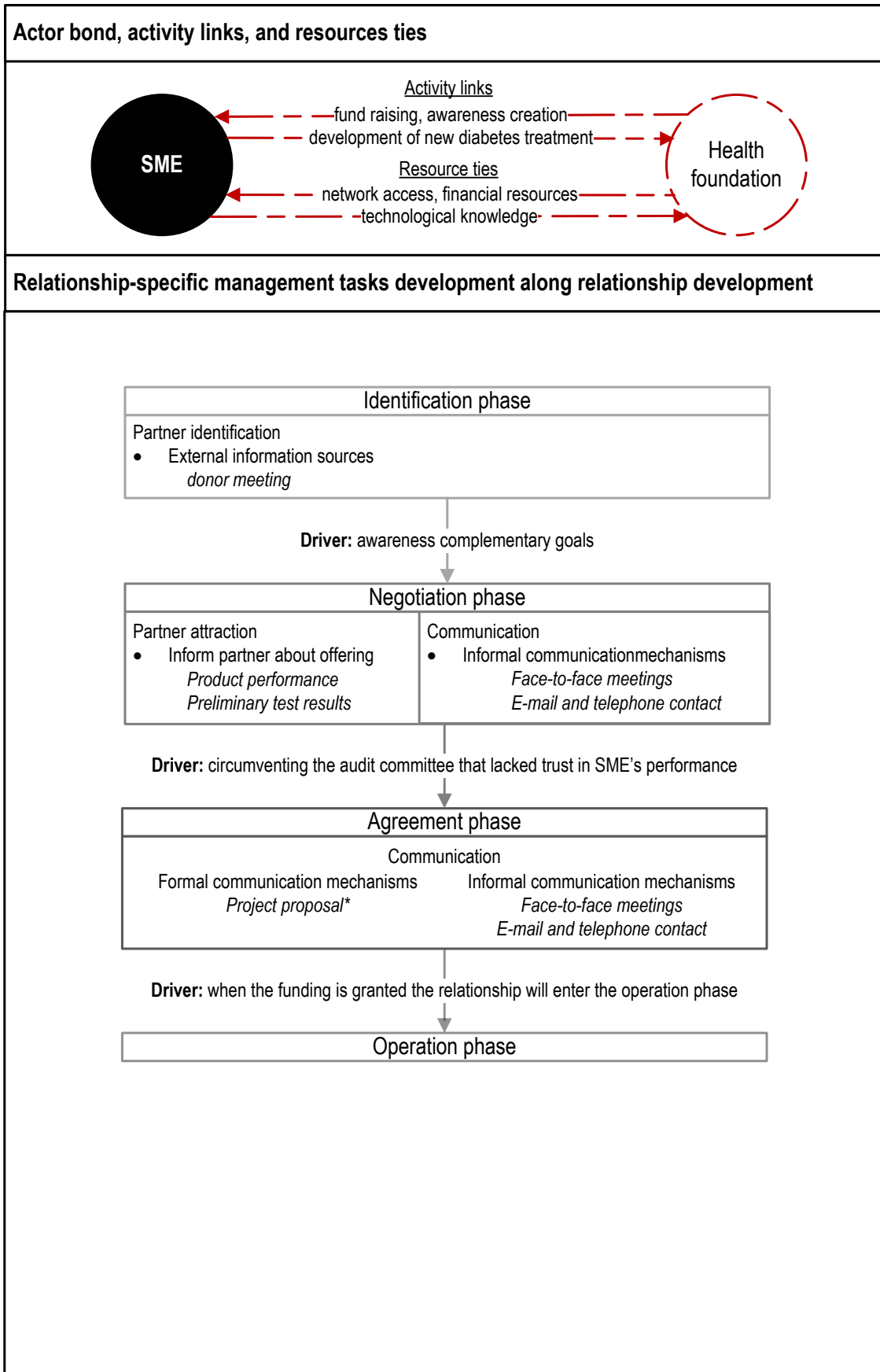


Figure 10. Relationship-specific tasks health foundation over time \*includes goals, incentive system and structural specifications.

## 5 Discussion

In the previous chapter the findings of the case were presented. In this chapter these findings are discussed. Firstly, the tasks conducted at the inventive SME to manage their asymmetrical relationships are compared to the tasks proposed in the literature. Secondly, it is explained that the development of the relationship-specific tasks along the development of the asymmetrical does not follow the life-cycle model proposed in the literature. Thirdly, it is discussed if there is a difference between the relationships in the different groups of asymmetry.

### 5.1 Comparison with the theory: the relationship-specific tasks

In chapter 2, a conceptual model of the relationships-specific tasks proposed by the state-of-the-art literature in the relationship field was developed. In table 7, the relationships-specific tasks found in the case are shown in bold. Based on the types of relationship-tasks – initiation, exchange, and coordination – the findings are briefly compared to the extant theory.

#### 5.1.1 The findings compared to the literature: the initiation tasks

As shown in the first column of table 7, the SME used its existing network of personal and IORs to identify potential partners. This finding confirms the results of Berends, van Burg, and van Raaij (2010) and Larson (1992) whom found that prior relations were important in explaining the formation of ties. In line with Ritter & Gemünden (2003), the SME also created external information sources to come into contact with potential partners. In contrast to the propositions of Larson (1992), the results do not reveal that the SME explicitly searched for partners based on organizational or personal reputation. It may be that the lack of reputation of the SME itself is an explanation for this finding. When the SME approaches a person or an organization based on their reputation, it is implausible that a potential partner is aware of the complementary goals and resources between them. Without the recognition that there are complementarities, the potential partner will almost certainly not feel the need to cooperate (Wohlstetter, Smith, & Malloy, 2005). Via public exposure and referrals of existing partners, the SME is able to communicate their goals and resources. In that way, the awareness of the potential partner about the complementarities is enhanced.

In most of the relationships the SME did not have formal criteria to select a potential partner or a prescribed evaluation process, as presented in the first column of table 7. Paragraph 4.3.1 shows that in the beginning the SME had no alternative partners to choose from. Later, partner selection was at its best based on informal selection criteria and at its worst on the gut feeling of the inventor. Numerous authors emphasize the importance of selecting the right partner for successful relationships (Dekker, 2004; Devlin & Bleakley, 1988; Ding et al., 2013; Grandori & Soda, 1995; Ireland et al., 2002; Mitrega & Ramos, 2011). This may explain the problems that the SME encountered in their relationship with the health foundation. If the SME had a set of formal selection criteria based on good predictors of desirable cooperative behavior it may have been better able to perceive the relational and performance risks of the SME's potential relationships (Dekker, 2004; Ireland et al., 2002). In the case of the health foundation, the SME could have foreseen parts of the problem and handle them adequately in an early stage.

Mitrega, Forkmann, Ramos, and Henneberg (2012) found four factors essential to the attraction of a potential partner, see the first column in table 7. The findings indicate that potential partners need to gain trust that relational and performance risks associated with the relationship are within limits. According to Rousseau, Sitkin, and Burt (1998) potential partners rely for this purpose on calculus-based trust that is based on credible information from reputations and existing relationships about another's goodwill and capabilities. As the SME lacks a reputation to build this image on the business showed its resources, network access, and product performance to build the image of reliable partner and when possible the experience of existing partners with the SME was added as support for their claims. Thus, the findings confirm the results of Mitrega, Forkmann, Ramos, and Henneberg (2012) in the sense that the SME communicated its relational success, informed the partner about its offering, and used recommendations of other partners to build the image of an reliable partner.

<b>Initiation tasks</b>	<b>#</b>	<b>Exchange tasks</b>	<b>#</b>	<b>Coordination tasks</b>	<b>#</b>
<i>Partner identification</i>		<i>Communication</i>		<i>Outcome control</i>	
Personal reputations		<b>Informal communication mechanisms</b>	6	<b>Goal setting</b>	4
<b>Firm reputations</b>		<b>Formal communication mechanisms</b>	6	<b>Incentive system</b>	5
<b>Prior relations</b>	3			<b>Performance monitoring</b>	3
<b>External information sources</b>	3	<i>Knowledge management</i>		Performance rewarding	
		<b>Creation of knowledge</b>	3		
<i>Partner selection</i>		Storage of knowledge		<i>Behavioral control</i>	
<b>Development of selection criteria</b>	1	<b>Transfer of knowledge</b>	5	<b>Structural specifications</b>	6
Evaluation process of potential partners		Support application of knowledge		<b>Behavior monitoring</b>	3
				Behavior rewarding	
<i>Partner attraction</i>		<i>Knowledge appropriation</i>			
<b>Communicate firm's relational success</b>		<b>Capacity to learn from partners</b>	6	<i>Social control</i>	
Build image of a reliable partner		<b>Avoiding unwanted transfer</b>	5	<b>Trust building</b>	4
<b>Inform business partner about offering</b>	6			Building leadership	
<b>Use recommendations of other partners</b>	2				
				<i>Conflict management</i>	
				<b>Joint resolution</b>	2
				<b>Persuasion</b>	2
				Coercion	
				Sanction	
				<b>Third party introduction</b>	1
				<i>Termination</i>	
				Select unfavorable relationships	
				Discontinue unfavorable relationships	

Table 7. The relationship-specific tasks found compared to literature

### 5.1.2 The findings compared to the literature: the exchange tasks

As shown in the second column of table 7, every relationship of the SME was characterized by a set of formal communication mechanisms. In the first place, the SME codified the agreements with the partner into a contract to reduce the relational and performance risks associated with asymmetrical relationships. The consequences of opportunistic behavior from partners in asymmetrical relationships resulting in unwanted knowledge spillovers can be detrimental for SME's (Colombo et al., 2012; Rosenbusch et al., 2011; Sawers et al., 2008). By capturing the agreement on paper, the SME deliberately increased mobility barriers to safeguarded their investments from being appropriated by the potentially opportunistic partner (Dekker, 2004; Hoffmann & Schlosser, 2001). In addition, the SME had a NDA with most of its partners. As the findings show, the SME strongly believes that a NDA not only protects their own knowledge, it also motivates the partner to share their knowledge with the business (column 2 in table 7). This confirms the propositions of Hoffmann and Schlosser (2001) that a NDA increases the transparency of the partner's complementary knowledge. And in turn improves the SME's capability to learn from the partner. However, the existing literature shows that to create success in learning the SME should not only motivate the partner to share their knowledge, but also develop its own learning capability. The learning capability of a business is determined by its desire to learn and its absorptive capacity (Hoffmann & Schlosser, 2001). The SME seems to lack either the desire to learn, absorptive capacity or both, because several of its partners indicate that they have valuable knowledge that the SME does not appropriate. In table 1 of chapter 2, it was shown that SMEs usually use their ability to absorb relevant knowledge limited and generally have an over-optimistic view of their performance (Freel, 2000; Kleinknecht, 1989; Nooteboom, 1994; Rothwell, 1991; Woodcock et al., 2000). Indeed, the findings illustrate that the inventor is strongly convinced in his skills to bring the artificial pancreas to market. Consequently, his desire to learn from partners is restricted. In addition, there is lack of time and resources to identify and absorb relevant knowledge for decision. Thus, the results demonstrate that the innovation barriers of SMEs also limit the capacity of the SME to appropriate complementary knowledge from its partners.

Besides the set of formal communication mechanisms, the second column of table 7 reveals that in every relationship a set of informal communication mechanisms was established ranging from face-to-face meetings to transfer of staff. The findings demonstrate that informal communication activities that involved face-to-face contact were used to transfer and creation tacit, complex and ambiguous knowledge. The other informal communication mechanisms, and a few formal communication mechanisms, facilitated the management of explicit knowledge. For that purpose, it is crucial to gain an understanding about which communication mechanisms are most suitable to the properties of the knowledge to be transferred, created and stored in the relationship (Easterby-Smith, 2008). Recently, scholars started to explore this topic more into depth. Like Blumenberg, Wagner and Beimborn (2009) who found that transfer of staff is positively impacts the sharing of tacit knowledge. However, a comprehensive framework to guide managers in selecting the right communication mechanisms based on the properties of the knowledge to transferred is still missing and provides an interesting avenue for further research. In sum, the results presented in the previous chapter underscore the emphasis of numerous authors on the importance of communication in IORs (Casey, 2008; Gardet & Fraiha, 2012; McGuire, 2001; Mohr & Spekman, 1994; Schreiner et al., 2009). The mechanisms used by the SME facilitated both the management and the appropriation of knowledge in their asymmetrical relationships.

### 5.1.3 The findings compared to the literature: the coordination tasks

Dekker (2004) proposed three types of control that need to be executed to coordinate the relationship: outcome control, behavior control and social control, see table 7 the third column. The first two involve a process from setting goals, establishing an incentive system and determining the structural specifications to monitoring the outcomes and behavior within the relationship to rewarding the outcomes and behavior of the partners. It was illustrated in chapter 4 that the goals, incentive system and structural specifications were codified into contracts in most of the SME's relationships. However, the extensive codification did not mean that the SME adheres itself or its partner to the agreements. In specific, the findings show that the SME mainly monitors the relationship on the quality of the outcomes and the partners' effort to strive for technological excellence. This may be attributed to the overly concern with the technical aspects of the innovation at the expense of the requirements necessary for successful market introduction (Freel, 2000). In their pursuit of technological superiority the SME neglects the importance of staying ahead of the competition. As a result the planned activities were often not executed within the set timeframe. In other words, the reliance on quality and effort as the evaluation criteria lead to delays in the

innovation project. In addition, the created incentive system was not actively used to reward the performance and behavior of the partners in the relationship. Therefore, the results indicate that ex-ante mechanisms of outcome and behavioral control have little value when the SME does not use these mechanisms to monitor and reward the performance and behavior of the partners ex-post. This counters the arguments of numerous authors who propose solely ex-ante mechanisms of control as critical success factors for IORs (e.g. Gardet & Fraiha, 2012; Grandori & Giuseppe, 1995; Ireland et al., 2002; Schreiner et al., 2009).

The third type of control is social control, see the third column in table 7. The main aspect of social control is trust (Dekker, 2004). Rousseau et al. (1998) argues that the information available from repeated interaction between the partners leads to the emergence of trust in the performance and behavior of other partner. The author calls this type of trust relational trust. Relational trust is important, because it leads to commitment and interest in the outcomes of the relationship decreasing the likelihood of opportunistic behavior, enhanced the perceived equality between partners and increasing the confidence in the capabilities of the other partner. This standpoint is underscored by the findings of the research, because the SME indicated that showing off their behavior and performance motivated its partners to adhere to its responsibilities in the relationship. Another type of social control is building leadership (Bryson & Crosby, 2006). There were no instances in which the SME tried to establish a leadership role in its relationships. This may be attributed to the asymmetrical nature of the studies relationships. As the SME was in every relationship considered to be in the subordinate position, it may prove difficult to build a leadership role. It would be an interesting avenue for future research to investigate how SMEs can build leadership within their relationship. As Bryson and Crosby (2006) suggest that even less powerful partners can build informal leadership to assure that their interest are taken into account.

Although there were relatively little conflicts in the relationships between the SME and its partners, the question what the SME would do when conflicts arose revealed that in the first place the SME strived to find a joint solution for the problem (see column three in table 7). In addition, it was shown that in projects funded by the governmental institutions conflicts had to be resolved via a third party. These findings are in accordance with the propositions of Mohr and Spekman (1994) who found that in an institutionalized environment third party arbitration is sought. However, the SME perceived that in some cases the conflict was not addressed properly. As a result, it tried to publically persuade the partner to solve the issue directly. However, the business acknowledged that it is better for the relationship to find a solution jointly or via the agreed procedure. For that reason the other two conflict resolution mechanisms – coercion and sanction – were not applied to solve disputes. The findings are in line with the current literature that propose that the use of these destructive conflict resolution techniques are often counter-productive and are very likely to strain the collaboration (Gardet & Fraiha, 2012; Mohr & Spekman, 1994). In conclusion, the findings confirm a large part of the extant literature into the management of asymmetrical relationships. However, it also counters or gives addition insight into some of its propositions. The deviations of the existing research can be mainly explained by the reliance of it on management practices in large, established organizations. Due to restrictions in size and reputation, the SME is unable to execute all the relationship-specific tasks proposed in the literature. Still, these tasks are discussed in a static manner in this paragraph. In the next paragraph, the management of asymmetrical relationships at SMEs as a process is discussed.

## **5.2 Comparison with the theory: the development of the relationship-specific tasks**

In the state-of-the-art of literature it was proposed that the development of the relationship would follow a life-cycle model from formation, to operation till the outcome of the relationship. According to Van de Ven and Poole (2005), this life-cycle model conceptualize change and development as a process of growth in which an organization proceeds through a sequence of phases. The sequence is irreversible, cumulative, linear, and predictable. Based on this model, relationship-specific managerial tasks were identified to suit every successive stage. However, the model proposed in chapter 2 is not reflected in the findings of this research. As shown in figure 11, after partner identification the development of the relationships of the SME followed a iterative cycle of negotiation, agreement and operation. In the identification phase, the SME and a potential partner got into touch for the first time. The first contact was established via referrals of existing partners, external information sources or reputations of the organization. The identification of a potential partner is essential, because without the search for potential partners a relationship will never be developed. The findings underscore the proposition of Holmen et al. (2005) that a beginning is always a necessary, but not sufficient, condition for the development of a relationship. Through the initial contact between the partners, both partners became aware that they had



complementary goals that would be difficult to achieve or may not be achieved without the other. In other words, both partners would profit from cooperating with each other. According to Das and Teng (2002) the need for another organization's assets creates a sense of dependence. Although dependence is prerequisite for a business to consider a partnership, the IMP tradition – among others – stresses that only when the partners mutually dependent on each other cooperation will take place (Das & Teng, 2002; Mouzas & Ford, 2007; Snehota, 2011). Empirically, the results of this study confirm that interdependencies do contribute to relationship formation. In conclusion, when the partners reached a mutual understanding of their complementary goals and needs, the relationship reached the negotiation phase.

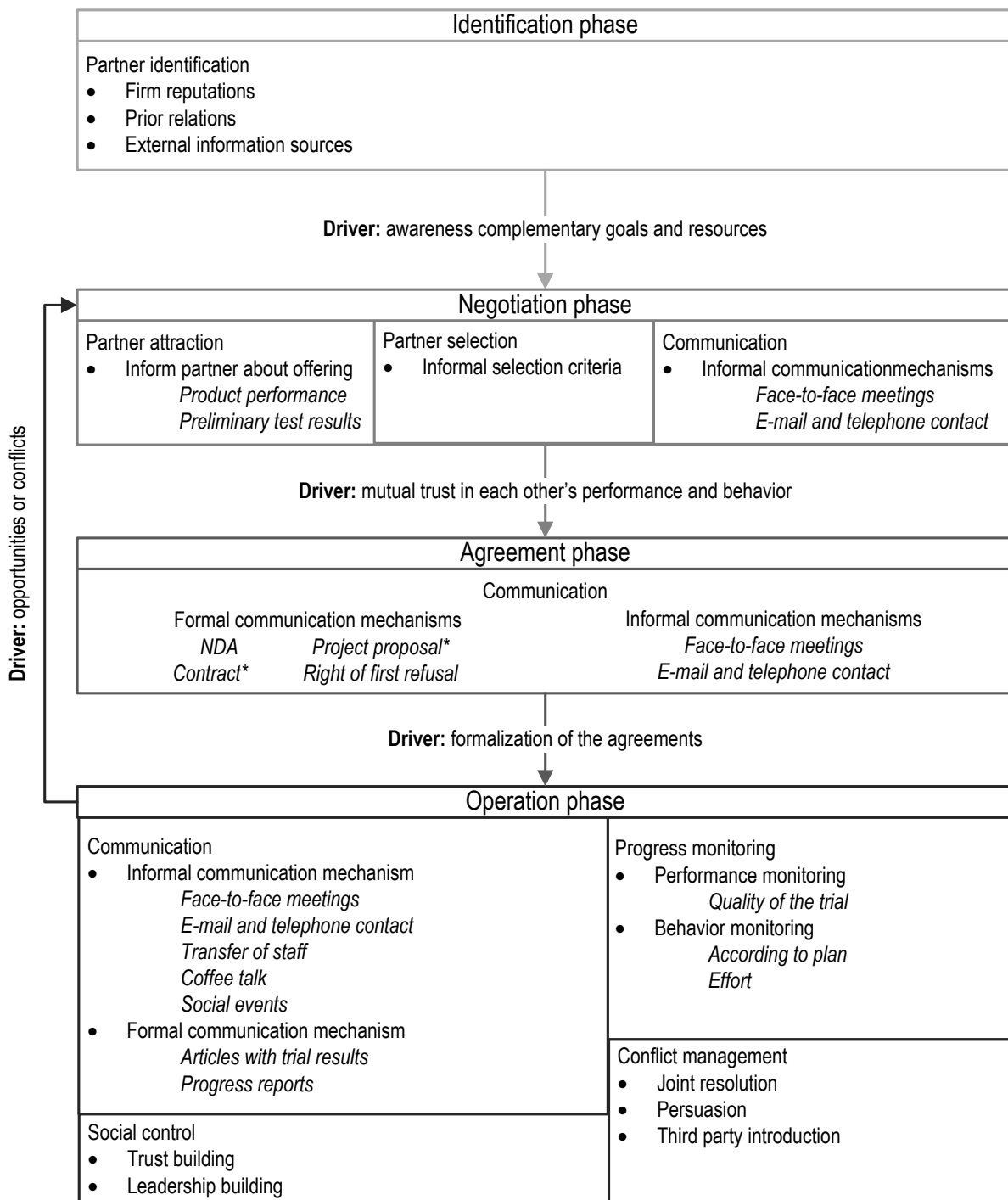


Figure 11. Development relationship-specific tasks along with relationship evolution

The negotiation phase shows close resemblance with the negotiation phase of Ring & Van de Ven (1994) in their iterative model of IOR development. In line with their model, in this phase the SME and its partners developed a joint understanding about the nature of the relationship they are exploring to undertake through a series of interactions (see figure 11). Often repeated negotiations in face-to-face meetings were necessary to provide the partners the opportunity to assess the other's trust-worthiness regarding its goodwill and capabilities. For this purpose, the SME selected potential partners based on a set of informal selection criteria and attracted potential partners to cooperate by informing the partner about its offering, communicating its relational success and using recommendations of prior relationships. Moreover, it was found that the partners had to trust that pooling the resources of their own business with its partner's resources would enhance the likelihood of success. Additionally, the partners had to be confident that the other would not act opportunistic and they will be fairly treated in the relationship. The results demonstrate that there may be a basis for cooperation based on the value of resources in relation to other resources as suggested by the IMP tradition (Aaboen et al., 2011), but it is not a sufficient condition for relationship development. Thus, only when both the relational and performance risks of the relationship were perceived to be low the relationship entered the agreement phase.

In the agreement phase, the SME and its partner reached an agreement about the terms, obligations, rules, and governance structure of the relationship during a series of interactions. The agreement phase is similar to the commitment phase of Ring and Van de Ven (1994). The authors suggest that the agreement between two partners can be informally understood in a psychological contract. As illustrated in figure 11, in this case all agreements were codified in a formal contract or project proposal. According to Mouzas and Ford (2007, p. 58) "*contracts provide the manifestation of consent in asymmetric relationships*". This implies that the level of conflicts between the partners in the asymmetric relationship had to be low before the agreements could be formalized. In the scientific community, there is a heated debate about the effect of conflicts in a relationships. While one group proposes that conflicts are beneficial for the performance of a relationship (e.g. Vaaland & Håkansson, 2003), the findings provide support for the other group who argues that effective cooperation demands a relatively low level of conflict (e.g. Bryson & Crosby, 2006; Das & Teng, 2002; Gardet & Fraiha, 2012). This may be attributed to asymmetry in the relationship. When the partners are unable to agree on the goals, incentive system and structural specifications of the relationship in addition to their inherent imbalance in power and size, an unworkable situation may arise. However, this paper is focused on asymmetric relationships. Thus, no definite conclusions can be drawn here. Yet, it would be interesting to explore the effect of conflicts in symmetrical and asymmetric relationships in future research.

After signing the agreement, the relationship between the SME and its partner moved into the operation phase. Following the propositions of Ring and Van de Ven (1994), in this phase the partners carried out the agreements. As presented in figure 11, a range of relationship-specific tasks were executed in this phase: the creation of communication mechanisms to manage and appropriate knowledge, the management of conflicts, and outcome, behavioral and social control. Although the phases differ slightly from the ones proposed in chapter 2, so far the phases seem to resemble a life-cycle model (Van de Ven & Poole, 2005). Yet, the case findings illustrated that during some of the relationships opportunities arose to move the collaboration a step forward or the level of interdependence between the partners changed resulting in a conflict of interest. The findings provides support for scholars who emphasized the central role of the institutional environment in the development IORs (Dickson, Weaver, & Hoy, 2006; Wohlstetter et al., 2005). For example, Wohlstetter, Smith, and Malloy (2005, p. 437) showed that "catalysts in the external environment tended to motivate leader to seek alliances to meet financial or political needs". The latter confirms that interdependence is not a static characteristic. Once the cooperation is underway the level of interdependence evolves (Das & Teng, 2002), it changes with the competencies and resources that each partner needs to complete their part of the project (Gardet & Fraiha, 2012).

In response to these opportunities or conflicts, the partners started to negotiate the rules and obligations, and benefits and costs of the relationship again. In other words, a transition from the operation to the negotiation phase was observed. Besides the similarity in the proposed phases, this finding supports additionally the teleological nature of the model of Ring and Van de Ven (1994). In opposition to the life-cycle models, more open-ended and iterative teleological process model were developed. According to the teleological perspective, businesses are purposeful and alert, but able to learn and adapt when the circumstances change (Rond & Bouchikhi, 2004; Van de Ven & Poole, 2005). Like illustrated in the case, Ring and Van de Ven (1994) propose that in time internal and external dynamics provided cause for rethinking the terms of the relationships. In their

teleological model, like in most of the teleological models, the focus is primarily on the negative causes of renegotiations between partners, like misunderstandings, changing expectations, and disappoint results (e.g. Ring & Van de Ven, 1994). However, this study shows that the renegotiations do not only result from conflicts between partners, but also from opportunities that require a reconsideration of the relationship's agreements. In conclusion, as presented in figure 11, the development of the SME's asymmetrical relationships developed after the identification of the partner along with a repetitive cycle of negotiation, agreement, and operation. The findings provide support for the teleological nature of the model proposed by Ring and Van de Ven (1994) as well as the projected phases. However, in contrast to their model the transition of one phase to the next is not influenced by the evaluation of equity and efficiency, but a broader perception of the performance and relational risks of the relationship. In addition, the model is complemented with the relationship-specific tasks, besides the face-to-face meetings and phone and e-mail contact, that develop along this cycle.

### 5.3 Comparison across relationships

In table 8, the number of times a relationship-specific task is present in a relationship was subdivided in the three groups of asymmetry identified in the method section (chapter 3). The table shows that most of the relationship-specific tasks that are executed at the SME are present at all categories of asymmetrical relationships. However, there is a lack of knowledge management, knowledge appropriation, and monitoring activities in the power group. This can be explained because there was only one relationship in this category, and this relationship did not move into the operation phase yet. Exactly these three activities are in the other relationships carried out in the operation phase. Therefore, it is expected that these tasks will be present in the power category as soon as the relationship transits into the operation phase. Thus, based on the findings of this research no distinction can be made based on these categories. Consequently, the results oppose the conclusions of Gardet and Fraiha (2012). The authors concluded that large size is not synonymous with power. There are two explanations for this opposing finding. Firstly, the level of analysis of the development of the relationship-specific tasks was different. While Gardet and Fraiha (2012) researched the evolution of tasks along the development of the network, this study researched their evolution along with the development of the individual relationship. As a consequence, it may be that the authors found differences between the various phases for the different categories of dependence, because the individual relationships between the groups did not developed synchronously. Therefore, it would be interesting to research the management process of SME's asymmetrical relationships along the development of the individual relationship and network simultaneously. In this way, the interaction between the different levels of analysis can be studied. Secondly, the research was limited to research asymmetrical relationships in which the SME was subordinate to the partner in terms of size and or power. Therefore, the relationships that were characterized by size asymmetry, but where the SME was the more powerful partner were neglected. It may be that in relationships where the SME is more able to dominate and influence the other, to initiate change in the relationship or to dominate the relationship, the business uses other relationship-specific tasks. However, when the SME is dominated in the relationship either due to size, power, or both the relationship is managed with the same methods. Consequently, it is an interesting avenue to compare relationships in which the SME is dominant to relationships in which the SME is subordinate.

In conclusion, this chapter compared the findings presented in chapter 4 with the theory of chapter 2. Firstly, the relationship-specific tasks found in the literature were compared to the empirical findings, see table 7. Secondly, the concept management of the relationship as a process was compared to the development of the tasks to manage the asymmetrical relationships of the SME, see figure 11. Thirdly, it was explained that there were no differences between the categories of asymmetry, see table 8. The next chapter includes the concluding remarks of this study.

Initiation tasks	Asymmetry (#)			Exchange tasks	Asymmetry (#)			Coordination tasks	Asymmetry (#)		
	Size	Power	Both		Size	Power	Both		Size	Power	Both
<i>Partner identification</i>				<i>Communication</i>				<i>Outcome control</i>			
Personal reputations				<b>Informal communication mechanisms</b>	3	1	2	<b>Goal setting</b>	1	1	2
<b>Firm reputations</b>	1			<b>Formal communication mechanisms</b>	3	1	2	<b>Incentive system</b>	2	1	2
<b>Prior relations</b>	1		2	<i>Knowledge management</i>				<b>Performance monitoring</b>	1		2
<b>External information sources</b>	1	1	1	<b>Creation of knowledge</b>	1		2	Performance rewarding			
<i>Partner selection</i>				Storage of knowledge				<i>Behavioral control</i>			
<b>Development of selection criteria</b>	1			<b>Transfer of knowledge</b>	2	1	2	<b>Structural specifications</b>	3	1	2
Evaluation process of potential partners				Support application of knowledge				<b>Behavior monitoring</b>	1		2
								Behavior rewarding			
<i>Partner attraction</i>				<i>Knowledge appropriation</i>				<i>Social control</i>			
<b>Communicate firm's relational success</b>				<b>Capacity to learn from partners</b>	3	1	2	<b>Trust building</b>	2		2
Build image of a reliable partner				<b>Avoiding unwanted transfer</b>	3		2	<b>Building leadership</b>			1
<b>Inform business partner about offering</b>	3	1	2								
<b>Use recommendations of other partners</b>	1		1					<i>Conflict management</i>			
								<b>Joint resolution</b>	1		1
								<b>Persuasion</b>			1
								<b>Coercion</b>	1		
								Sanction			
								<b>Third party introduction</b>			1
								<i>Termination</i>			
								Select unfavorable relationships			
								Discontinue unfavorable relationships			

Table 8. Relationship-specific tasks across categories of asymmetry

## 6 Conclusion

### 6.1 Theoretical contributions

In the first chapter three research questions were developed. For the purpose of readability repeated here:

- (1) What are the tasks executed by an innovative small and medium-sized enterprise to manage its asymmetrical relationships?
- (2) How do the tasks executed by an innovative small and medium-sized enterprise to manage its asymmetrical relationship change during the relationship?
- (3) What are the drivers of change in the tasks executed by an innovative small and medium-sized enterprise to manage its asymmetrical relationship?

The process research into six asymmetrical relationships of an innovative SME partly in retrospective and partly in real time provided the answers to these questions. The discussion of the research findings illustrates that many of the tasks used by large, established organizations to manage their relationships, are also used by the SME to manage their asymmetrical relationships, like staff transfers and NDAs. However, due its size and characteristics the SME is limited in the execution of some of these tasks. In the first place, the business cannot build trust in its goodwill and capabilities upon its reputation. In response, the SME showed off their product performance, financial resources and network access to gain the confidence of the partner. Secondly, the capability of a SME to learn from partners is constrained because it generally has an over the over-optimistic view of its performance and it has a limited ability to absorb relevant knowledge. Thirdly, the SME regularly neglects to monitor if the activities are carried out according to plan due its strive for technological excellence at the expense of fast market introduction. In the first instance the SME already found a way to circumvent their restrictions. In the two latter instances the characteristics are so embedded in the culture of the SME that it will be hard to change. Nevertheless, the SME is able to manage the asymmetrical relationships by using the plethora of other tasks. For this purpose, the SME does not have to distinguish between the source of asymmetry. There were no differences found between tasks conducted in the relationships characterized by size and or power asymmetry.

The previous chapter also demonstrates that the tasks to manage the SME's asymmetrical relationships follows the development of the relationship. It was shown that after the identification of the partner, the relationship developed along a repetitive cycle of negotiation, agreement, and operation. In the identification phase, the SME and a potential partner got into touch for the first time via referrals of existing partners, external information sources or reputations of the organization. In this phase the SME and its partners developed a joint understanding about the nature of the relationship through a series of interactions. For this purpose, the SME selected potential partners based on a set of informal selection criteria and attracted potential partners to cooperate by informing the partner about its offering, communicating its relational success and using recommendations of prior relationships. In the agreement phase, the SME and its partner reached an agreement about the terms, obligations, rules, and governance structure of the relationship that was formalized in a contract or project proposal. In the operation phase the partners carried out the agreements. A range of relationship-specific tasks were executed in this phase: the creation of communication mechanisms to manage and appropriate knowledge, the management of conflicts, and outcome, behavioral and social control.

The drivers of change were also discussed in chapter 5. The relationship moved into the negotiation phase, when both partners became aware that they had common goals that would be difficult to achieve or may not be achieved without the other. When both the relational and performance risks of the relationship were perceived to be low the relationship entered into the agreement phase. After signing the agreement, the relationship between the SME and its partner moved into the operation phase. In the operation phase, changes in the interdependence of partners resulting in conflicts or opportunities in the institutional environment caused the need to rethink the terms of the relationship. And from there the circle starts again from the negotiation phase. Based on these conclusions, it was argued that the relational and performance risks associated with asymmetrical relationships have to drop gradually from the point of identification. However, during the operation phase opportunities can drop these risks substantially or conflicts can increase these risks considerably causing the need to renegotiate. In short, this research contribute to the present research in the management of relationships by (1) studying relationship-specific tasks in the context of SME, (2) researching how these tasks changed during the relationship, and (3) investigating why these changed.

## 6.2 Managerial implications

These findings are of interest to SMEs that are considering to collaborate or are currently collaborating with asymmetrical partners, based on size and or power, in their innovation project. These businesses should consider the iterative model of asymmetrical relationship development and the relationship-specific management tasks that need to be carried out in each phase. In the initiation phase, the SME can either use public exposure for their innovation project or the referrals of their existing relationships to attract the attention of potential partners. In the negotiation phase, the SME needs to convince the partner in the asymmetrical relationship to collaborate. As the SMEs cannot rely on their reputation, the most effective way to attract the potential partner is to use recommendations of mutual relations to support the offering of the business and to emphasize the its relational success. Although the SME generally has no selection options, if the business has a choice between two or multiple organizations the business has to develop a set of formal selection criteria. It should be emphasized that reliance on a set of informal criteria increases the risks associated with asymmetrical relationships, and is therefore not recommended. In the agreement phase, the SME have to reach a mutual agreement with their partners. In this task, it is important to ensure that the agreements are codified into a contract. In this way, the risk of opportunistic behavior is reduced, a fair treatment is enforced and the commitment of the partner is warranted. In the operation phase, the SME should develop its learning capability. The business can do this by increasing the transparency of the knowledge of their partner. At the same time, it can improve on their own desire to learn and develop their absorptive capacity. Furthermore, the SME should monitor the performance of the relationship. When there is little interdependence between the business and their partner the high costs involved in performance monitoring do not exceed its benefits. As a result, no or very little control over the relationship is recommended. When there is considerable interdependence between the partners, a high amount of control is needed to ensure that the activities of the partners remain aligned. In the case of governmental funded projects, the SME probably has little influence on the monitoring process, but has to ensure that it meets the progress requirements of the involved institution. In response to the asymmetrical nature of the relationship conflicts between the partners arise. In order to resolve these conflicts, the SME is recommended to try to find a joint solution to the issue. In some relationships the methods of conflict resolution are institutionalized. Even in these cases joint resolution is preferred, but the introduction of third parties would be a good second option. Other resolution techniques, like coercion or persuasion, are discouraged due to the possible negative effects on the trust between the partners. In this phase, the SME should not forget to build up trust between itself and the partner. The business does not have a reputation, and therefore the most effective way to establish this trust is by showing the partner that it is able to meet the requirements of the agreement. As the frequent informal communication allows for complex, tacit and ambiguous knowledge to be transferred from the partner to the SME, informal communication mechanisms are crucial for the success of the relationship. It should be noted, however, that frequent exchange of high quality information can result in an increase of interdependence between two partners. This can cause the need to renegotiate the terms of the contract, and the cycle starts from scratch. Also, developments in the institutional environment can require a revision of the made agreements. Therefore, the SME should closely analyze if there are changes in the level of interdependence or dynamics in the institutional environment that cause change in the development of the relationship.

## 6.3 Research limitations

The theoretical contributions notwithstanding, there are several limitations to the study. Firstly, the findings are based on a case in a specific context. So, the results do not lend themselves well for generalization. In order to allow arguing for generality two forms of comparison were incorporated: comparison across relationships and with theory. Nevertheless, the case research here may be typical for asymmetrical IORs of SMEs in a medical innovation context. The development of medical devices is, although less than the medicinal drug discovery, a process that is highly regulated and fraught with uncertainty. The question remains if the proposed model applies to SMEs in more certain and less regulated innovation contexts. However, it was never the intention to prove a general theory. Rather, this paper is an effort to extend, and add empirical substance to the management process of SME's networks. Secondly, the classification of network management activities in terms of whether they link to a certain phase in the relationships development process is useful for analytical purposes. In reality, however, the phase as well as the activities overlap. For example, partners may start to exchange knowledge during conferences before formal commitments are closed. In addition, the network management tasks are related, and therefore influence each other. For instance, the formal agreements largely determine to what extent the relationship is monitored. The thesis did mention this issue, but did not analyze it in-depth. Thirdly, the findings are based on a combination of a retrospective and real-time longitudinal process research. Although this

approach allows the strengths of both approaches to be merged, it also means that the weaknesses of both may have influenced the results. On the one hand, the retrospective part of the research may suffer from hindsight bias limiting the accuracy and completeness of the data. In particular, on the IORs at the start of the project. The respondents may have forgotten relationships in the early phase of the innovation project. However, this seems unlikely due to small number of inter-relationships overall. Additionally, the researcher asked every interviewee to check the developmental process of their relationships with the SME. On the other hand, the real time longitudinal case study may have suffered from researcher bias. The vast amount of data being collected may have caused misinterpretation of data by the researcher. The presence of the researcher at the SME made it harder for her to always take an objective look. This could have negatively influenced the scientific nature of the research. In conclusion, the study was not without limitations. These limitations provide avenues for future research, as discussed in the next paragraph.

#### **6.4 Future research**

In this study the focus was on the relationship-specific tasks of the SME in managing its asymmetrical relationships. However, Ritter and Gemünden (2003) proposed a second set of tasks: cross-relational tasks. These tasks are necessary to manage a portfolio of relationships. Generally, organizations engage in multiple relationships at the same time. Each of these relationships should be managed individually. However, the relationship between two organizations will be affected by their respective interactions with other partners. Therefore, there is a need for organizations to consider its whole portfolio (Ritter, 1999). In particular, Draulans, DeMan, and Volberda (2003) showed that when there are more than six IORs in a portfolio, it could only be managed effectively with additional management systems. Nowadays many SMEs have a relationship portfolio that is larger than six. Yet, the literature into portfolio management is mainly based on studies in large, established organizations. Therefore, it would be interesting to research the cross-relational tasks of a SME with a portfolio of larger than six relationships. In addition, changes in a portfolio of relationships result from the aggregation of specific changes at the inter-organizational level. In turn, a changing relationship portfolio also influences the dynamics of dyadic relationships (Freytag & Ritter, 2005; Hite & Hesterly, 2001). Although the study did not examine such effects, it can be expected that the relationship-specific tasks interact with the cross-relational tasks over time. Therefore, it would be interesting to investigate the development of relationship-specific and cross-relational tasks simultaneously to see how the two interact. Besides that an IOR is affected by other the partnerships of a business, also the persons involved in the inter-organizational relationship have a considerable influence on the success of a relationship. Traditionally, scholars focused on the inter-organizational networks with as smallest unit of analysis the dyadic relationships between organizations (Ingram & Roberts, 2000; Kolk, Dolen, & Vock, 2011; Ma, Yao, & Xi, 2009). However, Hutt, Stafford, Walker and Reingen (2000) suggest that many collaborations fail to achieve their goals, because there is a lack of attention to the interpersonal connections between organizations. As a result it is recommended that organizations balance their efforts on developing ties on both these levels (Ma et al., 2009). Yet, only a few studies have disentangled interpersonal and inter-organizational networks and studied cross-level effects (Berends et al., 2010; Ma et al., 2009). For that reason, it would be valuable to study the cross-level interactions will be studied over time. Furthermore, this research has shown that changes in interdependence and opportunities in the environment cause the relationship to change. Other case studies may show other factors that affect the development of relationship-specific management tasks. Researchers are encouraged to study when and why these tasks change to add empirical substance to this topic in the network management literature. Additionally, as proposed in the previous paragraph, future work can concentrate on the interrelations between the relationship-specific management tasks. Moreover, three avenues for future research were highlighted in the discussion section of this paper: (1) leadership building at SMEs, (2) compare the effect of conflicts in symmetrical and asymmetric relationships, and (3) compare relationships in which the SME is dominant with relationships in which the SME is subordinate. All in all, this research has provided a better understanding of the management of asymmetrical relationship at SMEs. However, there are multiple ways to which the results of this study can be extended.

## 7 Bibliography

- Aboen, L., Dubois, A., & Lind, F. (2011). Start-ups starting up: Firms looking for a network. *The IMP Journal*, 5(1), 42–58.
- Alajoutsijärvi, K., Möller, K., & Tähtinen, J. (2000). Beautiful exit: How to leave your business partner. *European Journal of Marketing*, 34(11/12), 1270–1289.
- Albers, S. (2010). Configurations of alliance governance systems. *Alliance Governance Systems*, 62(July), 204–233.
- Alvarez, S. A., & Barney, J. B. (2001). How entrepreneurial firms can benefit from alliances with large partners. *Academy of Management Executive*, 15(1), 139–148.
- Astley, W. G., & Sachdeva, P. S. (1984). Structural sources of intraorganizational power: A theoretical synthesis. *Academy of Management Review*, 9(1), 104–113.
- Baxter, L. A. (1985). Accomplishing relationship disengagement. In Duck, S. and Perlmán, D. (Eds), *Understanding Personal Relationships: An Interdisciplinary Approach*. (pp. 243–265). London, United Kingdom: Sage Publications.
- Bengtsson, M., & Johansson, M. (2012). Managing coopetition to create opportunities for small firms. *International Small Business Journal*, 1–27.
- Berends, H., van Burg, E., & van Raaij, E. M. (2010). Contacts and contracts: Cross-level network dynamics in the development of an aircraft material. *Organization Science*, 22(4), 940–960.
- Bierly, P. E., & Gallagher, S. (2007). Explaining alliance partner selection: Git, trust and strategic expediency. *Long Range Planning*, 40(2), 134–153.
- Bizzi, L., & Langley, A. (2012). Studying processes in and around networks. *Industrial Marketing Management*, 41(2), 224–234.
- Blomqvist, K. (1999). Asymmetry in Partnership formation between Small and Large Technology Firms. In McLoughlin, Damien. and C. Horan (eds.), *Proceedings of The 15th Annual IMP Conference, University College, Dublin 1999 Page* (pp. 1–21).
- Blomqvist, K., Hurmelinna, P., & Seppänen, R. (2005). Playing the collaboration game right: Balancing trust and contracting. *Technovation*, 25(5), 497–504.
- Blumenberg, S., Wagner, H.-T., & Beimbom, D. (2009). Knowledge transfer processes in IT outsourcing relationships and their impact on shared knowledge and outsourcing performance. *International Journal of Information Management*, 29(5), 342–352.
- Bougrain, F., & Haudeville, B. (2002). Innovation, collaboration and SMEs internal research capacities. *Research Policy*, 31(5), 735–747.
- Bryson, J. M., & Crosby, B. C. (2006). The design and implementation of cross-sector Collaborations: Propositions from the literature. *Public Administration Review*, (December), 44–55.
- Casey, M. (2008). Partnership: success factors of interorganizational relationships. *Journal of nursing management*, 16(1), 72–83.



- Chesbrough, H. (2012). Open innovation: Where we've been and where we're going. *Research-Technology Management*, 55(4), 20–27.
- Chou, H.-H., & Zolkiewski, J. (2012). Decoding network dynamics. *Industrial Marketing Management*, 41(2), 247–258.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35(1), 128–152.
- Colombo, M. G., Laursen, K., Magnusson, M., & Rossi-Lamastra, C. (2012). Small business and networked innovation: Organizational and managerial challenges. *Journal of Small Business Management*, 50(2), 181–190.
- Dahl, R. A. (1957). The Concept of Power. *Behavioral Science*, 2(3), 201–215.
- Das, T. K., & Teng, B. (2002). The dynamics of alliance conditions in the alliance development process. *Journal of Management Studies*, 39(5), 725–746.
- Das, T. K., & Teng, B.-S. (2001). A risk perception model of alliance structuring. *Journal of International Management*, 7(1), 1–29. doi:10.1016/S1075-4253(00)00037-5
- Day, G. S. (2000). Managing market relationships. *Journal of the Academy of Marketing Science*, 28(1), 24–30.
- Dekker, H. C. (2004). Control of inter-organizational relationships: Evidence on appropriation concerns and coordination requirements. *Accounting, Organizations and Society*, 29(1), 27–49.
- Devlin, G., & Bleakley, M. (1988). Strategic alliances: Guidelines for success. *Long Range Planning*, 21(5), 18–23.
- Dickson, P. H., Weaver, K. M., & Hoy, F. (2006). Opportunism in the R&D alliances of SMES: The roles of the institutional environment and SME size. *Journal of Business Venturing*, 21(4), 487–513.
- Dijk, B. van, Menkveld, B., & Thurik, R. (1997). Some new evidence on the determinants of large- and small-firm innovation. *Small Business Economics*, 9, 335–343.
- Ding, R., Dekker, H. C., & Groot, T. (2013). Risk, partner selection and contractual control in interfirm relationships. *Management Accounting Research*, 24(2), 140–155.
- Doorewaard, H., & Verschuren, P. (2010). *Designing a research project* (2nd ed.). The Hague: Boom Lemma Uitgevers.
- Draulans, J., DeMan, A.-P., & Volberda, H. W. (2003). Building alliance capability: Management techniques for superior alliance performance. *Long Range Planning*, 36(2), 151–166.
- Duysters, G., Kok, G., & Vaandrager, M. (1999). Crafting successful strategic technology partnerships. *R&D Management*, 29(4), 343–351.
- Dwyer, R. F., Schurr, P. H., & Sejo, O. (1987). Developing buyer-seller relationships. *The Journal of Marketing*, 51(2), 11–27.
- Dyer, J. H., Kale, P., & Singh, H. (2001). How to make strategic alliances work. Retrieved from <http://sloanreview.mit.edu/article/how-to-make-strategic-alliances-work/>

- Dyer, J. H., & Nobeoka, K. (1998). Creating and managing a high performance knowledge-sharing network: The Toyota case.
- Easterby-Smith, M. (2008). Inter-organizational knowledge transfer: Current themes and future prospects. *Journal of management ...*, (June). Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-6486.2008.00773.x/full>
- Eisenhardt, K. M. (1989). Building theories from case study research. *The Academy of Management Review*, 14(4), 532.
- Emerson, R. M. (1962). Power-dependence relations. *American Sociological Review*, 27(1), 31–41.
- EU. (2005). *The New SME Definition: User Guide and Model Declaration*.
- Fleming, L., King, C., & Juda, a. I. (2007). Small worlds and regional innovation. *Organization Science*, 18(6), 938–954.
- Ford, D. (1997). *Understanding business markets* (2nd editio.). London, United Kingdom: Dryden Press.
- Ford, D., & Mouzas, S. (2013). The theory and practice of business networking. *Industrial Marketing Management*, 42(3), 433–442.
- Freel, M. S. (2000). Barriers to product innovation in small manufacturing firms. *International Small Business Journal*, 18(2), 60–80.
- Freel, M. S. (2004). Small firm innovation, Growth and performance: Evidence from Scotland and Northern England. *International Small Business Journal*, 22(6), 561–575.
- Freytag, P. V., & Ritter, T. (2005). Dynamics of relationships and networks: Creation, maintenance and destruction as managerial challenges. *Industrial Marketing Management*, 34(7), 644–647.
- Gans, J. S., & Stern, S. (2003). The product market and the market for “ideas”: Commercialization strategies for technology entrepreneurs. *Research Policy*, 32(2), 333–350.
- Gardet, E., & Fraiha, S. (2012). Coordination modes established by the hub firm of an innovation network: The case of an SME bearer. *Journal of Small Business Management*, 50(2), 216–238.
- Gardet, E., & Mothe, C. (2012). SME dependence and coordination in innovation networks. *Journal of Small Business and Enterprise Development*, 19(2), 263–280.
- Gibbert, M., Ruigrok, W., & Wicki, B. (2008). Research notes and commentaries what passes as a rigorous case study? *Strategic Management Journal*, 29, 1465–1474.
- Grandori, A., & Soda, G. (1995). Inter-firm networks: Antecedents, mechanisms and forms. *Organization Science*, 16(2), 183–214.
- Gronum, S., Verreynne, M.-L., & Kastle, T. (2012). The role of networks in small and medium-sized enterprise innovation and firm performance. *Journal of Small Business Management*, 50(2), 257–282.
- Gulati, R. (1998). Alliances and networks. *Strategic Management Journal*, 19(4), 293–317.
- Håkansson, H., & Ford, D. (2002). How should companies interact in business networks? *Journal of Business Research*, 55(2), 133–139.

- Håkansson, H., & Snehota, I. (1995). The burden of relationships or who's next. *IMP Conference (11th)*, (June). Retrieved from <http://www.escholar.manchester.ac.uk/uk-ac-man-scw:2n491>
- Håkansson, H., & Ford, D. (2005). The Idea of Business Interaction. *The IMP Journal*, 1(1), 4–20.
- Håkansson, Hakan, Ford, D., Gadde, L.-E., Snehota, I., & Waluszewski, A. (2009). *Business in networks*. Chichester: John Wiley & Sons.
- Halinen, A., Medlin, C. J., & Törnroos, J.-Å. (2012). Time and process in business network research. *Industrial Marketing Management*, 41(2), 215–223.
- Halinen, A., & Tähtinen, J. (2002). A process theory of relationship ending. *International Journal of Service Industry Management*, 13(2), 163–180.
- Halinen, A., & Törnroos, J.-Å. (2005). Using case methods in the study of contemporary business networks. *Journal of Business Research*, 58(9), 1285–1297.
- Hallen, L., Johanson, J., & Seyed-Mohamed, N. (1991). Interfirm adaptation in business relationships. *The Journal of Marketing*, 55(2), 29–37.
- Henneberg, S. C., Naudé, P., & Mouzas, S. (2010). Sense-making and management in business networks: Some observations, considerations, and a research agenda. *Industrial Marketing Management*, 39(3), 355–360.
- Hite, J. M., & Hesterly, W. S. (2001). Research notes and commentaries: The evolution of firm networks: From emergence to early growth of the firm. *Strategic Management Journal*, 22, 275–286.
- Hoffmann, W. H. (2005). How to manage a portfolio of alliances. *Long Range Planning*, 38(2), 121–143.
- Hoffmann, W. H., & Schlosser, R. (2001). Success factors of strategic alliances in small and medium-sized enterprises: An empirical survey. *Long Range Planning*, 34(3), 357–381.
- Holma, A., Björk, P., & Virtanen, H. (2009). Co-operation facilitators in dynamic business triads. *The IMP Journal*, 3(1), 75–94.
- Holmen, E., Roos, K., Kallevag, M., Raesfeld, A. von, Boer, L. de, & Pedersen, A.-C. (2005). How do relationships begin?
- Hurmelinna, P., Blomqvist, K., Puumalainen, K., & Saarenketo, S. (2005). Striving towards R&D collaboration performance: The effect of asymmetry, trust and contracting. *Creativity and Innovation Management*, 14(4), 374–383.
- Hutt, M. D., Stafford, E. R., Walker, B. A., & Reingen, P. H. (2000). Case study defining the social network of a strategic alliance. *Sloan Management Review*, winter, 51–62.
- Ingram, P., & Roberts, P. W. (2000). Friendships among competitors in the Sydney hotel industry. *American Journal of Sociology*, 106(2), 387–423.
- Ireland, R. D., Hitt, M. A., & Vaidyanath, D. (2002). Alliance management as a source of competitive advantage. *Journal of Management*, 28(3), 413–446.
- Jenkins, H. M. (2004). A critique of conventional CSR theory: A SME perspective. *Journal of General Management*, 29(4), 37–57.

- Johnsen, R. E., & Ford, D. (2001). Asymmetrical and symmetrical customer-supplier relationships: Contrasts, evolution and strategy. *Proceedings of the 17th Annual IMP*.
- Johnsen, R. E., & Ford, D. (2002). Developing the concept of asymmetrical and symmetrical relationships: Linking relationship characteristics and firms' capabilities.
- Jørgensen, F., & Ulhøi, J. P. (2010). Enhancing innovation capacity in SMEs through early network relationships. *Creativity and Innovation Management*, 19(4), 397–404.
- Kalaighnam, K., Shankar, V., & Varadarajan, R. (2007). Asymmetric new product development alliances: Win-win or win-lose partnerships? *Management Science*, 53(3), 357–374.
- Kale, P., Dyer, J. H., & Singh, H. (2002). Alliance capability, stock market response, and long-term alliance success: The role of the alliance function. *Strategic Management Journal*, 23(8), 747–767.
- Kale, P., Dyer, J., & Singh, H. (2001). Value creation and success in strategic alliances: Alliancing skills and the role of alliance structure and systems. *European Management Journal*, 19(5), 463–471.
- Khanna, T. (1998). The scope of alliances. *Organization Science*, 9(3), 340–355.
- Kleinknecht, A. (1989). Firm size and innovation: Observations in Dutch manufacturing industries. *Small Business Economics*, 1, 215–222.
- Kolk, A., Dolen, W., & Vock, M. (2011). Trickle effects of cross-sector social partnerships. *Journal of Business Ethics*, 94(S1), 123–137.
- Konsti-Laakso, S., Pihkala, T., & Kraus, S. (2012). Facilitating SME innovation capability through business networking. *Creativity and Innovation Management*, 21(1), 93–105.
- Landsperger, J., & Spieth, P. (2011). Managing innovation networks in the industrial goods sector. *International Journal of Innovation Management*, 15(06), 1209–1241.
- Langley, A. N. N. (1999). Strategies for theorizing from process data. *Academy of Management Review*, 24(4), 691–710.
- Larson, A. (1992). Network dyads in entrepreneurial settings: A study of the governance of exchange relationships. *Administrative Science Quarterly*, 37(1), 76–104.
- Lasagni, A. (2012). How can external relationships enhance innovation in SMEs? New evidence for Europe. *Journal of Small Business Management*, 50(2), 310–339.
- Lavie, D., & Rosenkopf, L. (2006). Balancing exploration and exploitation in alliance formation. *The Academy of Management Journal*, 49(4), 797–818.
- Lawton Smith, H., Dickson, K., & Smith, S. L. (1991). There are two sides to every story: Innovation and collaboration within networks of large and small firms. *Research Policy*, 20(5), 457–468.
- Leonard-Barton, D. (1990). A dual methodology for case studies: Synergistic use of a longitudinal single site with replicated multiple sites. *Organization Science*, 1(3), 248–266.
- Lind, P. (2012). *Small business management*. Oxon, United Kingdom: Routledge.

- Ma, X., Yao, X., & Xi, Y. (2009). How do interorganizational and interpersonal networks affect a firm's strategic adaptive capability in a transition economy? *Journal of Business Research*, 62(11), 1087–1095.
- McGuire, M. (2001). Managing networks: Propositions on what managers do and why they do it. *Public Administration Review*, 62(5), 599–610.
- Mitrega, M., Forkmann, S., Ramos, C., & Henneberg, S. C. (2012). Networking capability in business relationships: Concept and scale development. *Industrial Marketing Management*, 41(5), 739–751.
- Mitrega, M., & Ramos, C. (2011). Networking capability, networking outcomes, and company performance: A nomological model including moderation effects.
- Mohr, J., & Spekman, R. (1994). Characteristics of partnership success: Partnership attributes, communication behavior, and conflict resolution techniques. *Strategic Management Journal*, 15(2), 135–152.
- Möller, K., & Halinen, A. (1999). Business Relationships and Networks:: Managerial Challenge of Network Era. *Industrial marketing management*, 28, 413–427.
- Mouzas, S., & Ford, D. (2007). Contracting in asymmetrical relationships: The role of framework contracts. *The IMP Journal*, 1(3), 4263.
- Narula, R. (2004). R&D collaboration by SMEs: New opportunities and limitations in the face of globalisation. *Technovation*, 24(2), 153–161.
- Nieto, J., & Santamaría, L. (2010). Technological collaboration: Bridging the innovation gap. *Journal of Small Business Management*, 48(1), 44–69.
- Nooteboom, B. (1994). Innovation and diffusion in small firms: Theory and evidence. *Small Business Economics*, 6(5), 327–347.
- Ojasalo, J. (2004). Key network management. *Industrial Marketing Management*, 33(3), 195–205.
- Ojasalo, J. (2008). Management of innovation networks: A case study of different approaches. *European Journal of Innovation Management*, 11(1), 51–86.
- Parise, S., & Casher, A. (2003). Alliance portfolios: Designing and managing your network of business-partner relationships. *Academy of Management Executive*, 17(4), 25–39.
- Parkhe, A., Wasserman, S., & Ralston, D. A. (2006). New frontiers in network theory development. *Academy of Management Review*, 31(3), 560–568.
- Parmigiani, A., & Rivera-Santos, M. (2011). Clearing a path through the forest: A meta-review of interorganizational relationships. *Journal of Management*, 37(4), 1108–1136.
- Pettigrew, A. M. (1997). What is a processual analysis? *Scandinavian Journal of Management*, 13(4), 337–348.
- Pittaway, L., Robertson, M., Munir, K., Denyer, D., & Neely, A. (2004). Networking and innovation: A systematic review of the evidence. *International Journal of Management Reviews*, 5/6(3/4), 137–168.
- Porter, M. E. (1980). *Competitive strategy: Techniques for analyzing industries and competitors*. New York, United States: Free Press.

- Powell, W. W., Koput, K. W., & Smith-Doerr, L. (1996). Interorganizational and the collaboration locus of innovation: Networks of learning in biotechnology. *Administrative Science Quarterly*, 41(1), 116–145.
- Provan, K. G., Fish, A., & Sydow, J. (2007). Interorganizational networks at the network level: A review of the empirical literature on whole networks. *Journal of Management*, 33(3), 479–516.
- Raesfeld, A. von, Geurts, P., & Jansen, M. (2012). When is a network a nexus for innovation? A study of public nanotechnology R&D projects in the Netherlands. *Industrial Marketing Management*, 41(5), 752–758.
- Ring, P. S., & Van de Ven, A. H. (1994). Developmental processes of cooperative interorganizational relationships. *The Academy of Management Review*, 19(1), 90–118.
- Ritter, T. (1999). The networking company: Antecedents for coping with relationships and networks effectively. *Industrial Marketing Management*, 28, 467–479.
- Ritter, T., & Geersbro, J. (2011). Organizational relationship termination competence: A conceptualization and an empirical test. *Industrial Marketing Management*, 40(6), 988–993.
- Ritter, T., & Gemünden, H. G. (2003a). Interorganizational relationships and networks. *Journal of Business Research*, 56(9), 691–697.
- Ritter, T., & Gemünden, H. G. (2003b). Network competence. *Journal of Business Research*, 56(9), 745–755.
- Ritter, T., Wilkinson, I. F., & Johnston, W. J. (2004). Managing in complex business networks. *Industrial Marketing Management*, 33(3), 175–183.
- Rogers, M. (2004). Networks, firm Size and innovation. *Small Business Economics*, 22(2), 141–153.
- Rond, M. De, & Bouchikhi, H. (2004). On the Dialectics of Strategic Alliances. *Organization Science*, 15(1), 56–69. doi:10.1287/orsc.1030.0037
- Rosenbusch, N., Brinckmann, J., & Bausch, A. (2011). Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. *Journal of Business Venturing*, 26(4), 441–457.
- Rothwell, R. (1991). External networking and innovation in small and medium-sized manufacturing firms in Europe. *Technovation*, 11(2), 93–112.
- Rousseau, D. M., Sitkin, S. M., Burt, R. S., & Camerer, C. (1998). Introduction to special topic forum – Not so different after all: A cross-discipline view of trust. *The Academy of Management Review*, 23(3), 393–404.
- Saunders, M., Lewis, P., & Thornhill, P. (2009). *Research methods for business students* (5th ed.). London: Routledge.
- Sawers, J. L., Pretorius, M. W., & Oerlemans, L. a. G. (2008). Safeguarding SMEs dynamic capabilities in technology innovative SME-large company partnerships in South Africa. *Technovation*, 28(4), 171–182.
- Schilke, O., & Goerzen, A. (2010). Alliance management capability: An investigation of the construct and its measurement. *Journal of Management*, 36(5), 1192–1219.
- Schreiner, M., Kale, P., & Corsten, D. (2009). What really is alliance management capability and how does it impact alliance outcomes and success? *Strategic Management Journal*, 30, 1395–1419.

- Schumpeter, A. (1934). *The theory of economic development*. Cambridge, United Kingdom: Harvard University Press.
- Shaw, E. (2006). Small firm networking: An insight into contents and motivating factors. *International Small Business Journal*, 24(1), 5–29.
- Slotte-Kock, S., & Coviello, N. (2010). Entrepreneurship research on network processes: A review and ways forward. *Entrepreneurship Theory and Practice*, 34(1), 31–57.
- Snehota, I. (2011). New business formation in business networks. *The IMP Journal*, 5(1), 1–9.
- Snellman, K. (2001). Evolution of exchange relationships: past research and future directions. *17th Annual IMP Conference, Oslo*.
- Street, C. T., & Cameron, A. (2007). External relationships and the small business: A review of small business alliance and network research. *Journal of Small Business Management*, 45(2), 239–266.
- Subramani, M. R., & Venkatraman, N. (2003). Safeguarding investments in asymmetric interorganizational relationships: Theory and evidence. *The Academy of Management Journal*, 46(1), 46–62.
- Tomlinson, P. R., & Fai, F. M. (2013). The nature of SME co-operation and innovation: A multi-scalar and multi-dimensional analysis. *International Journal of Production Economics*, 141(1), 316–326.
- Vaaland, T. I., & Håkansson, H. (2003). Exploring interorganizational conflict in complex projects. *Industrial Marketing Management*, 32(2), 127–138.
- Van de Ven, A. H., & Poole, M. S. (2005). Alternative approaches for studying organizational change. *Organization Studies*, 26(9), 1377–1404.
- Van de Vrande, V., de Jong, J. P. J., Vanhaverbeke, W., & de Rochemont, M. (2009). Open innovation in SMEs: Trends, motives and management challenges. *Technovation*, 29(6-7), 423–437.
- Verhees, F. J. H. M., & Meulenbergh, M. T. G. (2004). Market orientation, innovativeness, product innovation, and performance in small firms. *Journal of Small Business Management*, 42(2), 134–154.
- Wilkinson, I., & Young, L. (1994). Business dancing - The nature and role of interfirm relations in business strategy. *Asia-Australia Management Journal-Australia Management Journal*, 2(1), 67–79.
- Wohlstetter, P., Smith, J., & Malloy, C. (2005). Strategic alliances in action: toward a theory of evolution. *Policy Studies Journal*, 33(3), 419–442.
- Wolff, J. A., & Pett, T. L. (2006). Small-firm performance: Modeling the role of product and process improvements. *Journal of Small Business Management*, 44(2), 268–284.
- Woodcock, D. J., Mosey, S. P., & Wood, T. B. W. (2000). New product development in British SMEs. *European Journal of Innovation Management*, 3(4), 212–222.
- Wynarczyk, P., Piperopoulos, P., & McAdam, M. (2013). Open innovation in small and medium-sized enterprises: An overview. *International Small Business Journal*, 31(3), 240–255.
- Yin, R. K. (1989). *Case study research: Design and methods* (revised ed.). London, United Kingdom: Sage Publications.

## 8 Appendices

### 8.1 SME definition by European Law

Enterprise category	Annual work unit	Annual turnover	Annual balance sheet total
<i>Medium-sized</i>	< 250	< €50 million	< €43 million
<i>Small</i>	< 50	< €10 million	< €10 million
<i>Micro</i>	< 10	< €2 million	< €2 million

### 8.2 Types of inter-organizational relationships

IOR	Definition
Alliance	Alliances are voluntary arrangements between firms involving exchange, sharing or co development of products, technologies, or services (Gulati, 1998, p. 293).
Buyer-supplier agreements	A buyer-supplier relationship is defined a business rapport, bound by obligation, investment, and commonality of interest, the purpose of which it to create value (Han et al., 1993, p. 331).
Co-branding	Co-branding represents a long-term marketing inter-organizational relationship between two or more firms seeking to benefit from combining two or more existing brands. (Parmigiani & Rivera-Santos, 2011, p. 1118).
Consortia	Consortia are relatively enduring inter-organizational relationships between three or more firms to mutually pursue both shared individualized organizational goals (Eisner et al., 2009, p. 852)
Cross-sector agreements	In cross-sector agreements firms, nonprofit agencies, and/or government entities come together to address a social issue such as health care, economic development, or sustainability of the environment (Parmigiani & Rivera-Santos, 2011, p. 1119).
Franchising	In franchising is a business arrangement wherein a firm (the franchisor) collects up-front and ongoing fees in exchange for allowing other firms (franchisees) to offer products and services under its brand name and using its processes (Combs et al., 2010, p. 100)
Joint ventures	Joint ventures involve the creation of a jointly owned separate entity by the partners, with risks and rewards for each parent (Parmigiani & Rivera-Santos, 2011, p. 1117)
Licensing	A licensing agreement is an inter-organizational relationship in which one firm (the licensor) rents proprietary knowledge to a second firm (the licensee) for use in the development and sale of products, in exchange for a lump-sum payment and or a royalty fee per unit and a commitment to follow the licensing contract (Parmigiani & Rivera-Santos, 2011, p. 1118).



### 8.3 Sources of the relationship-specific tasks

Initiation tasks	Source(s)
<b>Partner identification</b>	(Ritter, 1999)
Personal reputations	(Larson, 1992)
Firm reputations	(Larson, 1992)
Prior relations	(Larson, 1992)
External information sources	(Ritter & Gemünden, 2003b)
<b>Partner selection</b>	(Dekker, 2004; Devlin & Bleakley, 1988; Ding et al., 2013; Ireland et al., 2002; Mitrega & Ramos, 2011)
Development of selection criteria	(Bierly & Gallagher, 2007; Devlin & Bleakley, 1988; Ding et al., 2013; Mitrega et al., 2012)
Evaluation process of potential partners	(Devlin & Bleakley, 1988; Ding et al., 2013)
<b>Partner attraction</b>	(Mitrega et al., 2012)
Communicate firm's relational success	(Mitrega et al., 2012)
Build image of a reliable partner	(Mitrega et al., 2012)
Inform business partner about offering	(Mitrega et al., 2012)
Use recommendations of other partners	(Mitrega et al., 2012)
Exchange tasks	Source(s)
<b>Communication</b>	(Casey, 2008; Gardet & Fraiha, 2012; McGuire, 2001; Mohr & Spekman, 1994; Schreiner et al., 2009)
Informal communication mechanisms	(Gardet & Fraiha, 2012; Gardet & Mothe, 2012)
Formal communication mechanisms	(Gardet & Fraiha, 2012; Gardet & Mothe, 2012; Hoffmann & Schlosser, 2001)

<b>Knowledge management</b>	(Duysters, Kok, & Vaandrager, 1999; Parise & Casher, 2003)
Creation of knowledge	(Hoffmann, 2005; Ojasalo, 2004)
Storage of knowledge	(Hoffmann, 2005; Ojasalo, 2004)
Transfer of knowledge	(Hoffmann, 2005; Ojasalo, 2004; Street & Cameron, 2007)
Support application of knowledge	(Hoffmann, 2005)

<b>Knowledge appropriation</b>	
Capacity to learn from partners	(Hoffmann & Schlosser, 2001; Kale, Dyer, & Singh, 2002; Street & Cameron, 2007)
Avoiding unwanted transfer	(Hoffmann & Schlosser, 2001; Kale, Dyer, & Singh, 2001)

---

Coordination	Source(s)
<b>Outcome control</b>	(Dekker, 2004)
Goal setting	(Dekker, 2004; Devlin & Bleakley, 1988; Gardet & Fraiha, 2012; Hoffmann & Schlosser, 2001; McGuire, 2001)
Incentive system	(Albers, 2010; Dekker, 2004; Gardet & Fraiha, 2012; Hoffmann & Schlosser, 2001)
Performance monitoring	(Albers, 2010; Dekker, 2004; Devlin & Bleakley, 1988; Hoffmann & Schlosser, 2001)
performance rewarding	(Dekker, 2004)
<b>Behavioral control</b>	(Dekker, 2004)
Structural specifications	(Dekker, 2004; Grandori & Soda, 1995; Hoffmann & Schlosser, 2001; Ireland et al., 2002; Schreiner et al., 2009)
Behavior monitoring	(Albers, 2010; Dekker, 2004; Devlin & Bleakley, 1988; Hoffmann & Schlosser, 2001)
Behavior rewarding	(Dekker, 2004)
<b>Social control</b>	(Dekker, 2004; Grandori & Soda, 1995; Larson, 1992; Parise & Casher, 2003)
Trust building	(Dekker, 2004; Gardet & Fraiha, 2012; Hoffmann & Schlosser, 2001; Schreiner et al., 2009)
Building leadership	(Bryson & Crosby, 2006; Casey, 2008)

<b>Conflict management</b>	(Bryson & Crosby, 2006; Gardet & Fraiha, 2012; Mitrega et al., 2012; Ritter & Gemünden, 2003b)
Joint resolution	(Mohr & Spekman, 1994)
Persuasion	(Mohr & Spekman, 1994)
Coercion	(Mohr & Spekman, 1994)
Sanction	(Mohr & Spekman, 1994)
Thrid party introduction	(Mohr & Spekman, 1994)
<b>Termination</b>	Source(s)
Select unfavorable relationships	(Mitrega & Ramos, 2011; Ritter & Geersbro, 2011)
Discountinue unfavorable relationships	(Alajoutsijärvi et al., 2000; Halinen & Tähtinen, 2002; Mitrega & Ramos, 2011; Ritter & Geersbro, 2011)

---

#### 8.4 Appendix E: Formal and informal communication mechanisms

Informal	Formal
Standardized procedures	Common teams
Technical reports	Seminars
Analytical accounting	Meetings
Budgeting	Staff transfers
Planning methods	Decision-making mechanisms

---

## 8.5 Description partners of the asymmetrical relationships

### 8.5.1 Academic medical center

The academic medical hospital is the university hospital affiliated with the university of Dutch city. It is the most prominent medical center in the Netherlands and one of the largest hospitals. As an academic medical centre has three main tasks. Most important is the treatment of patients. Furthermore, the organization carries out medical-scientific research and takes care of medical education.

### 8.5.2 Health fund

The health fund aims to prevent and cure diabetes and the associated complications to give diabetics now and in the future a better quality of life. In order to accomplish their mission, the health fund raises money for scientific research and education.

### 8.5.3 Certification institute

The certification institute is an internationally active service-providing company with three business units: automotive, industrial and personnel. Their services and products range from motor vehicle testing to building surveys and from employment agency work to damage reports. The organization does not only provide services and products to increase their customers safety and quality, as a renowned testing and certification partner they also are allowed to demonstrate their customers high performance standards with the institute's seal.

### 8.5.4 European project

The research within the European project focuses on the development of a portable bihormonal artificial pancreas. For this purpose, the project partners will include automated closed loop glycaemic control, incorporate exercise detection in the control algorithm, develop a glucagon formulation, and perform a multinational controlled trial to compare the bihormonal artificial pancreas to standard insulin therapy in daily life.

### 8.5.5 Market leader

The market leader is a research-focused healthcare company. It discovers, develops and provides innovative diagnostic and therapeutic products and services that deliver significant benefit to patients and healthcare professionals from early detection and prevention of diseases to diagnosis, treatment, and treatment monitoring. It ranks among the world's leading healthcare businesses and has two strong core businesses: diagnostics and pharmaceuticals.

### 8.5.6 Research institute

The research institute is an independent research organization whose expertise and research make an important contribution to competitiveness of businesses and organizations, to the economy and to the quality of society as a whole. The institute has a good reputation and a well-known name as a knowledge organization in the Netherlands. The company does not develop knowledge for its own sake, but for practical application.

## 8.6 Macro of the interview protocols (Dutch)

### 8.6.1 Initiatie

- Hoe bent u in contact gekomen met de SME?
- Hoe verloopt het proces vanaf het moment dat u in contact bent gekomen tot de uiteindelijke samenwerking?
- Waarom heeft uw organisatie besloten om met de SME samen te werken?
  - *Probe:* Hoe is deze keuze tot stand gekomen?
- Hoe heeft de SME er voor gezorgd dat u met hen wil samenwerken en vice versa?
  - *Probe:* U kunt bijvoorbeeld denken aan dat het benadrukken van de SME's of uw sterke kanten of het gebruik van aanbevelingen van andere partners.
- Hoe zijn de onderhandeling verlopen?
  - *Probe:* Welke onderwerpen kwamen aan bod in de formele onderhandelingen?
  - *Probe:* Waren er naast formele onderhandelingen ook momenten waarop informele wijze met elkaar kennis gemaakt werd? Zo ja, op welke manier?

### 8.6.2 Coördinatie

- Wat is volgens u de rol van uw bedrijf in het innovatie project?
  - *Probe:* Is deze gedurende de ontwikkeling veranderd?
- Waarom is uw bedrijf geschikt om deze rol op zich nemen?.
- Wat is volgens u de rol van de SME in het innovatie project?
  - *Probe:* Is deze gedurende de ontwikkeling veranderd?
- Waarom is de SME geschikt om deze rol op zich nemen?
- Wat zijn de doelen van de samenwerking?
  - *Probe:* Zijn deze doelen in de loop van de samenwerking veranderd?
  - *Probe:* In hoeverre zijn deze doelen tot op heden bereikt? En in hoeverre denkt u dat deze doelen in toekomst bereikt worden? En zo ja, op welke termijn?
- Hoe wordt er voor gezorgd dat de doelen worden behaald?
  - *Probe:* Zijn deze mechanismen veranderd naar verloop van tijd?
- Hoe wordt het gedrag en de presentaties van uw en de SME gecontroleerd?
- Zijn er in het project ook vormen van sociale controle aanwezig? Zo ja, welke?
  - *Probe:* Bijvoorbeeld leiderschap of het opbouwen van vertrouwen.
  - *Probe:* Is de mate van sociale controle veranderd over de tijd?
- Op welke manier worden zouden eventuele conflicten opgelost worden?
  - *Probe:* Is er verschil in de manier waarop conflicten worden opgelost in het begin van de relatie en naarmate de relatie zich in later stadium bevindt?

### 8.6.3 Uitwisseling

- Welke communicatie middelen worden gebruikt om te communiceren?
  - *Probe:* Bijvoorbeeld formele communicatie middelen, zoals gezamenlijke databases, en informele communicatie middelen, zoals ongeplande meetings?
  - *Probe:* Zijn de gebruikte communicatie middelen veranderd over de tijd?
- Hoe managen jullie de kennis in de samenwerking?
  - *Probe:* Op welke manieren creëren jullie gezamenlijk de kennis?
  - *Probe:* Hoe zorgen jullie gezamenlijk ervoor dat deze kennis niet verloren gaat?
  - *Probe:* Hoe wordt ervoor gezorgd dat de kennis ook wordt toegepast?

### 8.6.4 Beëindiging

- Op welke manier evalueert uw of de relatie voorgezet moet worden?
- Als u de relatie met zou willen verbreken, hoe zou u dat doen?

## 8.7 Photographs of the prototypes



From left to right: the prototype 1 (2004), prototype 2 (2008), prototype 3 (2011), and prototype 4 (2013)