Master Thesis - Business Administration – Innovation & Entrepreneurship

Exploring network capabilities in networking behaviour for start-ups pursuing sustainable radical innovations

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Preface

I hereby present my Master Thesis "Exploring network capabilities in networking behaviour for start-ups pursuing sustainable radical innovations". This thesis is the final product for my master Innovation & Entrepreneurship, a specialisation in Business Administration at Radboud University Nijmegen.

I would like to thank my company supervisor John Schalken of SMB Life Sciences for his support and networking skills, which have allowed me to meet a lot of entrepreneurs. Also, I would like to thank Rikus Wolbers for his support and the opportunity to conduct this research at Novio Tech Campus. Furthermore, I would like to thank my supervisor Dr. Robert Kok for his feedback and support in the difficult but valuable process of writing this thesis.

I would also like to thank the entrepreneurs for their cooperation in this research and the inspiring stories they have provided. Last but not least, I want to thank all the colleagues at SMB and NTC, as well as my family and friends for supporting me during the past months.

I hope you enjoy reading my master thesis!

Nina Timmer

Nijmegen, January 2018

Abstract

The purpose of this research was to explore the network capabilities that are needed for start-ups in the life sciences and health and chemical industries to successfully develop and use their network. Furthermore, the influence of incubator support, legitimacy and proximity were explored. This explorative research was conducted through a multiple case study, in which entrepreneurs from start-ups pursuing sustainable radical innovations were interviewed. This resulted in four network capabilities that are needed to successfully develop and use a network: (1) creating balance between knowledge sharing and knowledge protection; (2) building and using (potential) contact knowledge; (3) creating diversity within the start-up and (4) coordination. This research provides a new perspective on networking behaviour in the context of start-ups in the life sciences and health and chemical industries. Additionally, legitimacy and cognitive proximity were highlighted as important factors in start-up's networking behaviour. Furthermore, this research has shown the importance of incubator support in network development for start-ups, through the provision of access to a broad network, office and/or lab space on a campus and network meetings.

Key words: start-ups, entrepreneurs, networking behaviour, network development, network use, network capabilities, legitimacy, incubator support, proximity, life sciences, health, chemical

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Chapter 1. Introduction

1.1. Networking and start-ups

The importance of networking has been widely acknowledged in literature. Networks are essential in acquiring resources and provide emotional and business support (Baum , Calabrese and Silverman, 2000). Since the failure of new firms is often attributed to a lack of resources and relationships (Baum et al., 2000), networking can be seen as crucial for start-ups. Network ties are shown to enhance the entrepreneur's ability in key entrepreneurial processes, such as acquiring resources, gaining legitimacy and spotting opportunities (Elfring & Hulsink, 2007). By developing a network, start-ups can gain access to technical, commercial and social resources, that they normally would only acquire after years of experience (Ahuja, 2000; Baum et al., 2000). Furthermore, networks significantly boost innovation output and competitiveness (Pittaway et al., 2004). Collaboration between organizations is increasingly recognized as important, since knowledge is distributed across organizations (Baldwin & Clark, 2000). These collaborations have resulted in many technological breakthroughs (Bougrain & Haudeville, 2002).

Thus, the benefits of networking are clear, but how do start-ups develop and use their network? As the ability of a firm to develop networks relies largely on what these firms are able to offer to others, networking can be difficult for start-ups (Ahuja, 2000). Also, a firm comes across as a more attractive and reliable partner when it already has relations to other firms (Ahuja, 2000). Any potential partner possesses less information about the start-up than the start-up itself: there is an information asymmetry. The partner faces the risk of the start-up displaying opportunistic behaviour (Ahuja, 2000; Shane & Cable, 2002). However, this information asymmetry can be overcome when previous partners can provide information on the start-up (Shane & Cable,

2002). Yet the question remains: how are start-ups able to develop their networks when they do not have many contacts to begin with?

The development and use of networks is especially of importance for start-ups in the chemical and life science industries. Start-ups in these industries often aim to develop sustainable breakthroughs while having to deal with high costs of capital intensive prototyping. They are dependent on partners in order to acquire resources. To acquire these resources, start-ups need to convince investors and other partners that their actions are legitimate (Ahuja 2000; De Clercq & Voronov, 2009; Zimmerman & Zeitz, 2002).

This can be an issue, especially since both the life sciences & health and chemical industries have been the subject of public concern in the past, for displaying opportunistic behaviour (Walker & Wan, 2012). An example in the life sciences & health industry is Theranos, a company based in Sillicon Valley. Theranos created blood tests based on lab-on-a-chip technology and had raised more than 400 million dollars in 11 years (Parloff, 2014). Even though Theranos claimed the tests were accurate and reliable, research in 2016 proved that the tests were in fact not reliable. This lead to Theranos being under criminal investigation for misleading investors (Stross, 2016). Similar examples have occurred in the chemical industry, where a lot of companies pretend to be more sustainable than they actually are, which is also referred to as greenwashing (Walker & Wan, 2012).

These examples of opportunistic behaviour raise the need for start-ups that are actually trying to develop sustainable innovations, to show they are legitimate. Sustainable innovation is often thought of in terms of environmental performance. However, in this research sustainable innovation is seen from a more holistic perspective where both social goals, for example improving the quality of life, as well as ecological goals play a role (Gimenez, Sierra & Rodon, 2012; Hart & Milstein, 2003).

Previous research on sustainable innovation has mainly been about large organizations. However, large firms are often shown to be inert and therefore have difficulties with accommodating the learning and creativity necessary to innovation (Dougherty & Heller, 1994). The importance of entrepreneurship in innovation has been acknowledged in literature. Henderson and Clark (1990) write that it is easier for new firms to build organizational flexibility, as they have less commitments to organizing their knowledge and old ways of learning. Also, start-ups are not constrained by rigidity of routines and resources (Gilbert, 2005). This flexibility makes it easier for start-ups to experiment with new technologies. This is especially of importance for radical innovations. Radical innovations are defined as "products and technologies that have high impact on the market in terms of offering (1) wholly new benefits; (2) significant improvement in known benefits; or (3) significant reduction in cost" (Leifer et al., 2000; O'Connor & DeMartino, 2006).

The experiments needed for radical innovation may take the start-up's attention away from the inclusion of stakeholders needed to commercialize their technologies. This inclusion of stakeholders is generally referred to as stakeholder management: the management and integration of relationships and interests of stakeholders to ensure success of the firm (Freeman & McVea, 2001). Stakeholders are not only shareholders, but also customers, suppliers, employees, communities and other groups. (Freeman & McVea, 2001) Start-ups pursuing radical innovations, compared to organizations in other contexts, might develop and use relationships with these stakeholders differently. They might need different capabilities. Capabilities are attributes that are embedded in the organization and not easily transferred (Walter, Auer & Ritter, 2006). The capabilities needed to develop and use networks are also referred to as network capabilities.

Another factor that might differentiate networking behaviour of start-ups in the life sciences & health and chemical industries, from networking behaviour of larger organizations or start-ups

in different contexts is the support of incubators. Start-ups in the life sciences & health and chemical industries are often part of incubator programmes that support start-ups with, for example office and/or lab space and network opportunities. These incubator programmes are often situated at a campus where multiple start-ups as well as larger organizations active in similar industries are situated. This proximity of (potential) network contacts might also influence the networking behaviour of start-ups in the life sciences and chemical industry.

1.2. Research objectives

To summarize, networks can be very valuable to start-ups. They are especially of importance for start-ups pursuing sustainable radical innovations in the chemical and life science industries, as they deal with legitimacy issues and high costs. Therefore, the purpose of this research is to study how start-ups in the chemical and life sciences and health industries develop and use their networks in order to contribute to sustainable radical innovations. More specifically, this research will focus on the capabilities that are needed in order to develop and use networks. Furthermore, the influence of legitimacy, incubator support and proximity of network actors, on start-up's networking behaviour will be studied. The ultimate goal of this research is to give entrepreneurs, as well as incubator managers, insights into what is needed in order to successfully develop and use networks.

The research question is:

In what way can start-ups in the life sciences and health and/or chemical industry develop and use networks to realize sustainable radical innovations?

1.3. Practical and academical relevance

Answering this question is not only relevant for entrepreneurs and incubator managers, but also contributes to academic research on networking, sustainable innovation and entrepreneurship. Even though a lot of research has been done on these topics, not that much is known in the

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context of the chemical and life sciences and health industries and cross-overs of these industries. Also, even though a lot is known about network development, there is considerable research to be done on the capabilities that are needed to develop and use networks.

1.4. Thesis outline

The remainder of this research is structured as follows. First of all, a theoretical framework is presented, in which the main concepts and theoretical perspectives on these concepts are discussed. The theoretical framework is followed by the methodological section, in which the research cases are introduced and methodological choices are explained. Thereafter, the results are discussed, followed by the conclusion and discussion.

Chapter 2. Theoretical framework

2.1 Networks

A network is a broad concept which can be defined in many different ways. For example as a set of actors, such as people, departments or businesses, and what links these actors to each other, such as family, finance, community and business alliances (Johnson & Johnson, 1999; Fuller-Love & Thomas, 2004). A slightly different perspective is provided by Hakansson and Snehota (1995), who describe networks as a set of interdependent relationships that consist of three components or layers: actors, resources and activities. Firstly, actor bonds connect actors to each other. Actor bonds also affect the way actors perceive each other and how they form identities in relation to each other. Secondly, resource ties connect resources of organizations to each other. For instance, technologies, materials and knowledge. Lastly, activity links entail connections of commercial, administrative and technical activities, between organizations (Hakansson & Snehota, 1995; Johnson & Johnson, 1999). These three layers are interdependent, in the sense that they all need each other.

In previous literature on networks, network contacts are often described as either strong, or weak ties. The strength of ties is often defined by duration, emotional intensity, and reciprocity (Granovetter, 1973). Through weak ties, new information and contacts can be acquired. Strong ties often provide legitimacy and access to resources. Both strong and weak ties are important in organizational development and growth (Elfring & Hulsink, 2007). Another way in which network contacts can be distinguished is in horizontal or vertical ties (Lechner & Dowling, 2003). Horizontal ties are for example competitors. Vertical ties can be suppliers or customers.

Lechner and Dowling (2003) studied the contacts of firms in different types of networks. The network types they discuss are social, reputational, co-opetition, marketing and knowledge, innovation and technology (KIT) networks. Social networks are of importance for start-ups as

they function as the initial resource pool. They lead to trust-based vertical and horizontal ties. Reputational networks consist of contacts that can provide the start-up with a reputation. As mentioned before, start-ups are viewed as more reliable when they already have relationships with other firms, therefore reputational networks can be seen as the key to new contacts (Ahuja, 2000; Lechner & Dowling, 2003). Co-opetition networks consist of trust-based relationships between competitors. Marketing networks include contacts that provide the organization with market information, for example on how to enter new markets. Marketing networks are predominantly vertical and often overlap with social, KIT and co-opetition networks. Knowledge, innovation and technology (KIT) networks consist of both weak and strong, horizontal and vertical ties that come with new technological knowledge. Lechner and Dowling (2003) argue that the composition of a firm's network changes over time, they call this composition the relational mix. This relational mix differs in the number of contacts, direction of the relationship (horizontal or vertical) and in the relationship's intensity.

2.2 Networking and start-ups

Networking for start-ups is quite different from networking for large organizations. Lechner and Dowling (2003) write that the relational mix of fast growing start-ups generally consists out of social networks and reputation networks, these networks function as the foundation for future network options. Thus, the foundation for start-ups lies for a big part in the entrepreneur's personal network.

Furthermore, the ability of a firm to develop and use networks is dependent on the characteristics and preferences of the entrepreneur(s). McGrath and O'Toole (2013) studied factors that enable and inhibit a start-up's ability to develop and use networks. The authors found that previous network experience can enable entrepreneurs to see opportunities and benefits in collaboration activities. Another network capability enabler on the actor level they

found is the ability of the entrepreneur to create opportunity through contacts. Inhibiting factors on this level are the entrepreneur's lack of ambition to grow and the entrepreneur's desire to be in control.

Another factor that differentiates networking for start-ups from networking for large organization is that start-ups are more flexible and informal than large organizations, since they are often not constrained by rigidity of routines and resources (Gilbert, 2005).

2.3. Network development

Previous literature shows multiple perspectives on network development. Lechner and Dowling (2003) found that entrepreneurial firms follow a continuous process of developing, adding and dropping ties (contacts). An organization tends to start with a small number of strong ties. Over time, weak ties are added and strong ties that have become redundant are dropped. Thereafter, these weak ties are developed into strong ties and the process continues. Weak ties become more important when the organization grows, as they come with new opportunities. (Lechner & Dowling, 2003)

Elfring and Hulsink (2007) describe three patterns of network development. The first pattern is called network evolution, which is characterized by a dominance of strong ties in the emergence phase and a growing number of weak ties in the early growth phase. The strong ties provide the organization with access to resources and feedback, the weaker ties mostly provide information on opportunities. Organizations following this pattern are mostly industry insiders pursuing incremental innovations, which are mostly focused on acquiring resources through strong ties. Weak ties become more relevant when they start looking for new opportunities. (Elfring & Hulsink, 2007) The second pattern of network development described by Elfring and Hulsink (2007) is network renewal. In this pattern, both strong and weak ties are important in the emergence phase. Weak ties provide new information for spotting opportunities, where strong

ties provide legitimacy and resources. Strong ties also help in the search for weak ties. In the early growth phase some weak ties develop into strong ties and some weak ties are dropped. This pattern of network renewal is mostly seen in industry insiders pursuing radical innovations. The third pattern of network development is called network revolution. This pattern is characterized by a big amount of weak ties in the emergence phase. A lot of weak ties are eventually dropped and some develop into strong ties. Organizations following this pattern are mostly independent start-ups pursuing radical innovations (Elfring & Hulsink, 2007).

While in the previously discussed theories, network development is viewed as change in configurations of networks, this research sheds another light on network development. In this research, network development is viewed as growth of the size of the network due to a process in which network contacts are developed. Scarbrough, Swan, Amaeshi and Briggs (2013) call this process the deal-making process, which they define as: "a process through which different entrepreneurial actors secure resources in pursuit of entrepreneurial opportunities" (p. 1203). The authors distinguish an early and a later phase of deal-making. The early phase starts with opportunity identification or creation. A selection has to be made from a number of ties. When ties have been selected, introductions and meetings are arranged. Thereafter the later phase follows, which involves evaluation and realization activities. The development process shifts from selecting ties to deciding on how ties can be steered toward a successful outcome (Scarbrough et al., 2013). After the in-depth evaluation of ties, terms will be negotiated and a contract will be realized. Even though Scarbrough et al. (2013) mainly focus on relationships aimed at financial resources, the process is expected to be similar for other kind of relationships.

Lorange, Roos and Brøn (1992) study the alliance formation process and distinguish two phases similar to those of Scarbrough et al. (2013). Namely, the initial phase and the intensive phase. The initial phase is about assessing the match with a potential partner. It is about assessing potential benefits from partnering up, possible synergies between the parties and learning

opportunities. The authors emphasize the importance of a win-win situation. The second and last phase Lorange et al. (1992) present is the intensive phase. At this point in the alliance formation process, the match is evaluated based on detailed information. Thereafter, the agreements are formalized. The authors see the alliance formation process as an ongoing process, that does not stop after a contract is made.

Even though networking for start-ups might not always consist of formal procedures and contracts, the process of developing contacts is expected to be quite similar, consisting of (1) selecting potential contacts, (2) evaluating these potential contacts and (3) negotiating and agreeing on terms.

2.4 Network use

Network development on its own does not guarantee success. The developed contacts also need to be well utilized. In line with the research of Elfring and Hulsink (2007), this research recognizes three key entrepreneurial processes for which network contacts can be used: (1) acquiring resources, (2) gaining legitimacy and (3) spotting opportunities.

When discussing resources, often the first thing that comes to mind are financial resources. However, the entrepreneurial process of acquiring resources entails not only financial resources, but also more tacit resources such as knowledge and social capital. Network contacts also have the ability to provide legitimacy. Once a firm has relationships with other firms, it will come across as more attractive and reliable to other potential contacts (Ahuja, 2000). Furthermore, network contacts can be used for spotting new opportunities, as they provide access to new information and opportunities to meet new people (Elfring & Hulsink, 2007).

Successful execution of these key entrepreneurial processes might lead to the development of new contacts. Acquired resources, for example in terms of knowledge, can make firms more attractive to potential contacts, since it has more to offer. Legitimacy through existing

partnerships can increase the attractiveness and reliability of a firm. Also, existing contacts can lead to new contacts through new opportunities. In other words, network use is expected to positively influence network development. Furthermore, network development is expected to positively influence network use, since developed contacts are likely to be developed for a specific purpose and therefore expected to be used.

However, there does seem to be a limit to the number of network contacts that can be used at the same time, since organizations have limited time and resources. Previous literature emphasizes the need to manage networks efficiently (Baum et al., 2000). When the number of a firm's contacts increases, these contacts can potentially become redundant, since they possess the same information and capabilities. A redundant network can limit the firm's access to new information (Lechner & Dowling, 2003; Baum et al., 2000). Also, an inefficient network can lead to criticism from potential investors and conflicts between network relations. Baum et al. (2000) define an efficient network as a network configuration where the diversity of information and capabilities is high.

2.5 Network capabilities

The theories discussed above give insights into what network development and network use entail. The purpose of this research is to study what is needed to successfully develop and use networks. This will be done from the perspective of the resource-based view of the firm (RBV). This theoretical view sees firm-specific resources as the basis for a firm's competitive advantage (Teece, Pisano & Shuen, 1997). One specific type of resources is referred to as capabilities, which can be defined as "attributes that enable organizations to coordinate and utilize their resources" (Barney, 2002). Capabilities are embedded in the organization and not easily transferred (Walter et al., 2006).

The ability to develop and use networks has been referred to in different terms with slightly different definitions. Walter et al. (2006) define network capability as "a firm's ability to develop and utilize inter-organizational relationships" (p. 541). Ritter and Gemünden (2003) refer to the concept as network competence which is defined as a firm's "ability to manage their networks of relationships effectively" (p. 746). Lechner and Dowling (2003) argue that there are three capabilities of importance for the management of networks: relational capability, combinative capability and absorptive capacity. Relational capability is about the ability to select, develop and maintain relationships. Absorptive capacity is the "capability to absorb external knowledge" (Lechner & Dowling, 2003, p.4). Finally, combinative capability is about combining various elements that are developed outside of the organization. In this research, the ability to develop and use networks will be referred to as network capabilities.

In the following paragraphs, these network capabilities, distinguished in relational, absorptive and combinative capabilities, and their relationship to network use and development will be elaborated on.

2.5.1. Relational capabilities

Relational capabilities have been studied in many different contexts, defined in many different ways (Smirnova, Naudé, Henneberg, Mouzas & Kouchtch, 2011). Many studies see relational capabilities in the context of creating and managing customer relationships (Day, 1994; Jacob, 2006). In this research, a broader view on relational capabilities is taken into account, by not just focusing on customer relationships, but on any kind of interorganizational relationship. This is more in line with the research by Lorenzo and Lipparini (1999), who define relational capability as the capability to interact with other companies. Furthermore, it is similar to the definition by Dyer and Singh (1998), who see relational capability as a firm's willingness and ability to partner. In this research, relational capability is defined as the ability to select, develop

and maintain relationships with partners (Lechner & Dowling, 2003). Relational capability in this sense, is actually in line with what Walter et al. (2009) refer to as network capability.

Walter et al. (2006) distinguish four dimensions of network capability, in this research referred to as relational capability: coordination, relational skills, partner knowledge and internal communication. Coordination is about planning, controlling and synchronizing activities within the network (Walter et al., 2006), and is therefore expected to positively influence network development and use through successful network management. Relational skills reflect the ability of an organization to develop close relationships and include for example communication and conflict management skills (Walter et al., 2006). Relational skills are not only needed to develop new relationships, but also to maintain current relationships, therefore they are also expected to influence both network development, as well as network use. Partner knowledge is information about partners, which include suppliers, customers and competitors. This information can be helpful in network development as well as in network use. The more knowledge an organization has on a potential partner, the easier it is to select and evaluate potential relationships. Furthermore, knowledge on partners is helpful in recognizing new opportunities. The last dimension is internal communication, which can be important in network development as well as network use, since it is needed to be open and responsive to new relationships and opportunities and is important in organizational learning. (Walter et al., 2006). Furthermore, clear communication helps with efficient network management.

2.5.2. *Absorptive capacity*

As mentioned above, one of the activities a network is used for is the acquisition of resources. This entails not only financial resources, but also more tacit resources such as knowledge. Knowledge can be difficult to transfer from one organization to another. For this reason, absorptive capacity is needed. Cohen and Levinthal (1990) define absorptive capacity as "the

ability to recognize the value of new, external information, assimilate it and apply it to commercial ends" (p. 128). According to Zahra and George (2002) and Gebauer, Worch and Truffer (2012), absorptive capacity entails the acquisition, also referred to as exploration, assimilation, transformation and exploitation of knowledge. Acquisition or exploration describes a firm's capability to identify and acquire external knowledge (Zahra & George, 2002; Gebauer et al., 2012). Assimilation entails the firm's capability to analyse, process, interpret and understand the acquired information. Transformation refers to the firm's ability to combine existing and new knowledge. Lastly, exploitation is about the actual use and implementation of knowledge (Zahra & George, 2002; Gebauer et al., 2012).

The authors emphasize that absorptive capacity is critical for an organization's innovativeness (Cohen & Levinthal, 1990; Zahra & George, 2002; Gebauer et al., 2012). Absorptive capacity is expected to not only positively influence network use, but also network development, since what an organization has to offer positively influences the willingness of partners to cooperate (Ahuja, 2000). When a start-up is able to successfully acquire and use knowledge, it also becomes more attractive for other organizations to partner with.

2.5.3. Combinative capabilities

Kogut and Zander (1992) argue that innovations are a result of an organization's combinative capabilities. While Lechner and Dowling (2003) define combinative capability as the ability to combine various elements that are developed outside of the organization, Kogut and Zander write that combinative capabilities synthesize and apply not only current, but also acquired knowledge (Kogut & Zander, 1992). Combinative capabilities are in line with the notion of dynamic capabilities, which can be seen as an extension to the resource-based view. Eisenhardt and Martin (2002) define dynamic capabilities as "the organizational and strategic routines by which managers firms achieve new resource configurations as markets emerge, collide, split,

evolve and die" (p. 1107). In other words, combinative capabilities help organizations to actually use the resources that are acquired from partnerships, by combining it with existing resources. Therefore, it is expected to positively influence network use. Combinative capability is also expected to positively influence network development, since newly combined resources can raise the attractiveness of the start-up as a partner.

Van den Bosch, Volberda and de Boer (1999) distinguish three types of combinative capabilities: systems capabilities, coordination capabilities and socialization capabilities. Systems capabilities reflect the degree to which knowledge is systematised by formalisation and routinisation. Coordination capabilities are about cross-functional interfaces and degree of participating in decision-making processes. Socialization capabilities are about the density of social linkages and shared social experiences in an organization, as well as between an organization and its partners (Gebauer et al., 2012; Van den Bosch et al., 1999).

2.6 Legitimacy

As mentioned before, the willingness of the potential partner to cooperate with the start-up is also of influence on the start-up's ability to develop and use networks. This willingness to cooperate is largely based on legitimacy. Legitimacy can be defined as: "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs and definitions" (Suchman, 1995, p. 574). Potential partners face the risk of the start-up displaying opportunistic behaviour. This is especially of importance for start-ups in the chemical and life sciences industry. Their products are not fully developed yet, therefore there is no tacit proof and the partnership is largely based on a perception of the legitimacy of the start-up. Therefore, legitimacy is expected to positively influence the relationship between network capabilities and network use and development. Furthermore, network development and use are expected to positively influence legitimacy.

When an organization already has partners, it will come across as more reliable to potential partners (Ahuja, 2000).

Zimmerman and Zeitz (2002) discuss four types of legitimacy that play a role in new ventures. The first is regulatory legitimacy, which is about the start-up complying with laws and regulations. The second form of legitimacy is normative legitimacy, which is about the start-up addressing societal norms and values. Another type of legitimacy discussed by Zimmerman and Zeitz (2002) is cognitive legitimacy, which is about addressing widely held beliefs and assumptions. Lastly, Zimmerman and Zeitz (2002) propose the industry itself can be seen as a source of legitimacy. This legitimacy represents the collective action of industry members.

2.7 Incubator support

A business incubator is an organization that is aimed at supporting and accelerating development and success of new ventures (Scillitoe & Chakrabarti, 2010). Previous studies have generated conflicting results regarding incubator influence on the success of start-ups. Hansen, Chesbrough, Nohria and Sull (2000) found that what they call "networked incubators" can provide start-ups with access to relationships, through which start-ups can obtain resources and quickly develop new relationships. However, the authors do note that only one in four incubators actually qualifies as a "networked incubator", which is an incubator that provides organized networking, on top of the basic benefits like funding, coaching, office space and common services (Hansen et al., 2000). Elfring and Hulsink (2007) found that incubatees (start-ups that are incubator-driven) pursuing radical innovations mainly relied on their own relationships. The role of the incubator in providing relationships aimed at acquiring resources and spotting opportunities for these start-ups was quite small. However, the incubator was helpful in providing the start-up with legitimacy (Elfring & Hulsink, 2007). Even though previous literature shows conflicting results, this research proposes that incubator support positively influences the relationship between network capabilities and network development

and use. The incubator can be helpful in developing network contacts, by sharing its network and providing legitimacy. Furthermore, incubator programmes often include coaching and assistance in acquiring resources, which can be helpful in network use.

2.8. Proximity

Another factor that has to do with the transmission of (knowledge) resources and therefore might influence network development and use, is proximity. By proximity, the distance between actors within a network is meant. From previous literature, different types of proximity can be distinguished: geographical, institutional, cognitive/technological, social and organizational proximity (Freel, 2003; Marrocu, Paci & Usai, 2013; Werker, Ooms & Caniëls, 2016). Geographical proximity, also referred to as spatial proximity, reflects the physical distance between actors (Hewitt-Dundas, 2013). Even though technological advancements in the past decades have made long distance communication easier. It is still shown to be of relevance, especially in facilitating interactions. Institutional proximity is about the similarity of the institutional framework actors are embedded in (Marrocu et al., 2013). For instance, two actors from the same country might more easily exchange knowledge, than actors from different countries. Cognitive or technological proximity is about the proximity of the existing knowledge base, which indicates that actors that share similar knowledge, can exchange knowledge more easily (Marrocu et al., 2013). Cognitive proximity is related to absorptive capacity, in the way that cognitive proximity is needed to absorb new knowledge (Boschma, 2005). Social proximity is about being embedded in a social context. The notion behind this type of proximity is that actors that are socially embedded, are more likely to trust each other, which makes sharing tacit knowledge easier. Lastly, organizational proximity is about distance in organizational terms. Torre and Rallet (2005) define organizational proximity as actors that share a same system of representations or set of beliefs, which facilitates their ability to interact. All in all, previous literature shows

that these five types of proximity facilitate interaction and enhance the exchange of knowledge. Therefore, they are expected to influence network development and use.

2.9. Theoretical conclusion

Previous literature has provided insights into which capabilities are needed to successfully develop and use networks and what roles legitimacy, proximity and incubator support play in networking behaviour. However, not much empirical research has been done in the context of start-ups, especially not in the chemical and life sciences industry. Therefore, this research aims to find out if these capabilities proposed in literature actually play a role in start-ups in these particular industries, but does not exclude the possibility of discovering capabilities that have not yet been covered in previous literature.

Chapter 3. Methodology

3.1. Research design

This research makes use of a qualitative approach to study which capabilities are needed for start-ups to successfully develop and use networks, in order to develop sustainable radical innovations and become viable business partners. Capabilities are processes embedded in an organization, which makes them hard to identify (Eisenhardt & Martin, 2002; Walter et al.,2006). Therefore, an in-depth qualitative approach is preferred over a quantitative approach. Furthermore, a qualitative approach is suitable for topics that have not been researched extensively and for which the aim is to develop a measurement instrument, or in this research: a tool for start-ups (Boeije, 2012). More specifically, a multiple case study will be conducted. Since this research is explorative, a case study is preferred over more structured methods like surveys and experiments (Rowley, 2002). In an experiment, the researcher has much more control over variables, and therefore can influence situations with the objective to test certain hypotheses (Rowley, 2002). An experiment is not suitable for this research, because this research is explorative and not confirmative. A survey is more suitable for research aimed at discovering relationships that are common among a large number of research units, of which the results can be generalized to a large population. However, a survey does not provide a deep understanding of the data (Gable, 1994). In a case study, the number of units is lower, but it allows deep and detailed investigation (Rowley, 2002). Furthermore, a multiple case study enables exploration of differences within and between cases (Baxter & Jack, 2008).

3.2. Case selection

This research is mainly based on semi-structured interviews with entrepreneurs from 8 start-ups that are pursuing or have tried to pursue sustainable radical innovations. These start-ups operate or have operated in different contexts. Start-ups in the life sciences & health industry, the chemical industry and cross-overs between these two industries were compared. Due to

these difference contexts, start-ups in these groups were expected to show differences in their networking behaviour and capabilities.

Table 1. Description of industries

Industry	Description
Life sciences & health	Companies that develop healthcare products.
Chemical	Companies that develop sustainable products for which chemical processes are used.
Cross-overs	Pharmaceutical companies that develop healthcare products for which chemical processes are used.

Since the accessibility of start-ups pursuing sustainable radical innovations is low, only one interview per case was conducted. For the life sciences & health and cross-overs, three interviews were conducted. For the chemical industry, only two interviews were conducted, because of low accessibility. Furthermore, two additional interviews were conducted for extra information.

Almost all start-ups that were interviewed are or were part of incubator programmes that support in funding, coaching, office space, common services (labs etc.) and organized networking. See the table below for an overview of the selected start-ups. All names are fictional.

Table 2. Case selection

Criteria	Main case selection								Extra cases	
	ArtMen	qHeart	S-Waves	MoBio	Frontra	Surlants	BioPack	MicFlu	ITpharma	C-BioPharma
Product	Artificial meniscus	Equipment for heart diseases	Soundwaves for medical treatments	Bioactive molecules	Hormonefree contraception	Surgical sealants	Biobased packaging	Microfluidics	IT and compliance services	Contract research
Industry	Life sciences & Health	Life sciences & Health	Life sciences & Health	Cross-over	Cross-over	Cross-over	Chemical	Chemical	IT/Life sciences & Health	Cross-over (Life sciences & Health and Chemical)
Incubator support	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No
Successful	Yes	No	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Development stage	Start-up	Terminated scale-up (2015)	Start-up	Start-up	Start-up in termination (2017)	Start-up	Scale-up/Grown-up	Start-up	Terminated start-up (2014)	Grown-up
Founding year	2017	2012	2014	2015	2012	2009	1998	2016	2012	1997
Number of employees	3	20*	2	8	4	3	60*	4	2	180*

*approximately

3.3. Data collection

The interviews were semi-structured, which means the interview questions were based on theory, in order to ensure all relevant topics are addressed. However, a semi-structured interview still enabled diverting from the previously formed questions, which can result in gaining valuable new perspectives (Symon & Cassell, 2012). Previous to the interview, a short questionnaire was sent to the informants (see appendix B). This questionnaire was aimed at mapping the network contacts of the start-up, by asking about the purpose, closeness, frequency and duration of relationships. Furthermore, proximity was measured in the questionnaire, by asking the informant about determinants for developing one successful and one unsuccessful contact. The survey data was used to specify the interview questions to each case. Thus, the interview questions were unstandardized. The interview questions were based on the central constructs of this research: network development, network use, network capabilities, legitimacy, incubator support and proximity.

The operationalization of the concepts described in chapter 2 can be found in appendix A, the interview questions can be found in appendix C.

3.4. Data analysis

The interviews were recorded and transcribed. In order to analyse the data, three types of coding were used. Coding is a process in which data is distinguished in themes or categories, to which a code is assigned (Boeije, 2005; Yin, 2009). Since this is an explorative research, the coding process was kept as open as possible. However, since the interview questions were largely based on theory, there were some preliminary codes that followed from the operationalization of the theory (appendix A). In this research, the software programme Atlas.ti was used to code the data. The first type of coding used was open coding, which is also referred to as initial coding. In open coding, the data functions as a starting point (Boeije, 2005; Saldana, 2009). Open coding fits with the explorative character of this research, because it makes sure the researcher

remains "open to all possible theoretical directions" (Charmaz, 2006, p. 46). In open coding, the data is carefully read and divided into fragments. Thereafter, a code is assigned to the relevant fragments. The next type of coding used is called axial coding, which is about reconfiguring the data, by connecting categories (Boeije, 2005; Saldana, 2009). Axial coding results in a smaller list of codes, which cover only the important elements of the research. Finally, selective coding, also referred to as theoretical coding, was used. Selective coding is about deciding which categories are most important and finding relationships between these categories. This way, the coding process moves from data to theory (Saldana, 2009). The relationships between categories that resulted from selective coding have been interpreted and compared with what is known from theory.

3.5. Research ethics

Symon and Cassell (2012) argue that in qualitative research, it is important to sensitively handle data. In this research, various measures were taken to ensure the confidentiality and anonymity. First of all, fictional names were used. Furthermore, transcripts were sent back to participants, so that they had the opportunity to withdraw certain statements, they wish not to be addressed in this research.

Chapter 4. Results

In this chapter, the results of this research will be discussed. First, the main goals for which a network is used and developed will be discussed. Thereafter, the development of new contacts and the use of contacts to accomplish these goals will be discussed. Subsequently, the capabilities that are needed to develop and use the start-up's network will be addressed. Furthermore, the influence of legitimacy, incubator support and proximity on network use and development will be discussed.

4.1. Network goals

Three main goals for which a network is used and developed by start-ups pursuing sustainable radical innovations have been found in the interviews. These 'network goals' are: (1) acquiring resources; (2) acquiring a market position and (3) acquiring access to networks.

4.1.1. Acquiring resources

Both tacit and intacit resources are acquired through the network of the entrepreneur. The most prevalent type of resources that was discussed in the interviews is financial resources. Furthermore, the acquisition of other tacit resources, such as materials, chemicals, machines or tests supplied by other companies, was discussed. Another type of resources discussed by the informants is knowledge resources, this includes technological knowledge, but also industry knowledge and business knowledge. Finally, human resources were discussed, including employees as well as externally hired human resources, such as consultants or professors.

4.1.2. Acquiring a market position

Furthermore, the interviews showed entrepreneurs use and develop their network to create a market for their product. Although most informants are not actually selling yet, they are already meeting potential customers.

4.1.3. Acquiring access to networks

Lastly, the acquisition of access to networks as a goal, resulted from the interviews. Through existing contacts access to the networks of these contacts is acquired.

The development and use of a start-up's network to accomplish these three goals will be further discussed in the next paragraphs.

4.2. Start-up's networks

In this paragraph, mapping of the individual start-ups' networks is attempted. Thereafter, the development and use of start-up's networks will be discussed.

4.2.1. Network mapping

In the questionnaire, the informants were asked to describe several contacts and the strength of the relationships with these contacts. Based on this data, network mapping was attempted (see table 3). However, both the number of contacts, as well as the type of contacts mentioned by the informants, differed largely. Therefore, the view of the start-ups' individual networks may be incomplete. However, there does seem to be a connection between the start-up's development phase and the contacts that were mentioned. In the table below, an overview of the types of contacts mentioned per start-up is presented. A more elaborate overview of the contacts per start-up and the strength of the relationships can be found in appendix D.

Table 3. Network mapping: number and types of contacts

	ArtMen	qHeart	S-Waves	MoBio	Surlants	BioPack	MicFlu
Development phase	Start-up	Terminated scale-up	Start-up	Start-up	Start-up	Scale-up/ Grown-up	Start-up
Collaborations	2	1		4	3		
Investors/financial contacts			1	3	1	1	
Customers						2	
Employees/colleagues			2				
Advisor		1					1
Other		1		1			

Assuming the start-ups mentioned their most important contacts, it seems like start-ups in different development phases value different types of contacts. For example BioPack, which is a more matured company, seems to see customers as the most important contacts. MicFlu, which is a very young organization, that is in the early process of talking to potential customers and has not received many financial resources yet, mentioned an advisor.

4.3. Network development

In this research, network development refers to the increase of size of the network by developing new contacts. First, the way start-ups develop contacts will be discussed. Thereafter, negotiation with contacts will be discussed.

4.3.1. Developing new contacts

4.3.1.1. Indirect contact development

The interviews show that for start-ups, new contacts are mostly developed through existing contacts. Through an existing contact, access to the network of this contact can be acquired. As illustrated by the CTO of qHeart: *"A network is exponential. If you have a small network, it is hard, you will have to do a lot by yourself. But the bigger your network gets, the easier it is to get introduced to someone else."* Thus, there seems to be a so-called snowball effect. Some entrepreneurs even deliberately develop contacts to get access to the contact's network, like in the case of MicFlu attracting a senior advisor: *"We involved him because we know how important his network is."* For the CEO of MoBio, his existing contacts also help in developing new contacts: *"When I need something, I spend a night searching through the saved contacts on my computer and LinkedIn. I memorize who knows what. And who has which contacts, because it is not always direct, sometimes it is indirect."* The CMO of ArtMen experiences this so-called indirect contact development as well: *"... a lot is through contacts, like the incubator. But also through people you meet on the way, or at conferences."* The CMO of ArtMen is not the only entrepreneur who highlights the role of the incubator in acquiring access to networks, this will be further elaborated on in paragraph 4.7.

The previous examples show that a lot of contacts are developed through existing contacts. Therefore, the following proposition is suggested:

Proposition 1: network use positively influences network development (in terms of size)

4.3.1.2. Direct contact development

Only few of the informants mentioned they sometimes find potential contacts on the internet. Some of the informants indicated that when they find someone on the internet they sometimes ask existing contacts about their experiences with these potential contacts. Furthermore,

sometimes contacts are directly developed at industry events and conferences. However, direct contact development does not seem to be very much used in start-up's network development.

4.3.2. Negotiation

The interviews show that sometimes the use of contacts for certain purposes requires negotiation, as a part of the network development process. This is primarily the case for contacts that are developed to acquire resources. Some of the informants highlight the lack of power in negotiating on financial resources. *"Most investors say, I will invest 100.000 and I want 10% of your shares. If you try to negotiate for 6% of the shares, most investors will say figure it out"* (CEO, MoBio). This lack of bargaining power is also experienced in negotiations with potential customers. Even though many of the informants are not selling yet, they are already meeting potential customers to secure future financial resources. The CEO of MicFlu especially experiences differences in negotiating between small and big potential customers: *"As a small company, you want to go with the flow of the big ones. With smaller companies, your bargaining position might be stronger, because they have less to offer you ... With big companies, the ball is in their hands, they have more to demand and they can say no."* The same goes for BioPack: *"With the very big customers, there is not much space to negotiate, because they have their requirements. With smaller companies, we define the relationship."*

The informants feel like they have more power in negotiating with suppliers, as opposed to negotiating with investors: *"Since we are a start-up they understand that we ask for a lower price"* (CEO, MoBio). They also indicate that it is important to be realistic and transparent in negotiations: *"You have to discuss the win-win situation ... Very open and transparent and only in this way you will work things out together"* (CEO, Frontra). The CEO of MoBio illustrates this as well: *"My experience is that once you are realistic in your negotiations, people are more likely to agree with a lower price or better conditions."*

4.4. Network use

In this research, network use refers to the actual use of contacts to pursue network goals. This paragraph will elaborate on different types of contacts mentioned by the informants and the network goals they serve. These different types of contacts are: (1) (potential) customers (2) investors (3) suppliers (4) other collaborations and (5) undefined contacts. Although the role that these different types of contacts play in start-ups realizing innovations might seem somewhat obvious, the interviews show that these different types of contacts can serve different goals.

4.4.1. (Potential) customers

Logically, customers serve as the (potential) buyers of the start-ups' products, in other words, they participate in the market positioning. However, the interviews show that (potential) customers also serve as providers of different types of resources.

For example in the case of Surlants, where potential customers provide financial resources: *"You need to convince a preferably big company. ... That is where we are now. Our money from grants and subsidies is almost finished and now it's time for a second phase with bigger money. We do this with a big company. This big company is perfectly capable to finance this, and when it really succeeds, sell it."* S-Waves is in a comparable situation, where multiple potential customers finance testing for S-Waves' product: *"I don't have to pay for testing the product. People find this surprising, but there is such a need for what we do, so they give us a chance to research it."*

For qHeart and BioPack, customers provided new opportunities regarding market positioning. qHeart actively searched for these new opportunities through meetings with customers: *"We regularly had meetings with customers to discover their needs, because this way we could realize technological developments that solved the customer's problems."* Additionally,

BioPack experienced a specific demand from customers and turned this into a new product: *"A lot of new developments come from things we are not able to do. A customer asked us to make a certain product, but we were not able to make this product, so we started a research project with a university."*

4.4.2. Investors

Logically, investors provide start-ups with financial resources. However, investors can also provide knowledge resources. As illustrated by the CEO of Surlants: *"We talk to a lot of venture capitalists. Through these conversations you get a lot of information, because these people talk to a lot of start-ups."*

For ArtMen, an academic hospital and a big pharma company are shareholders, but also serve as potential customers, with whom knowledge is created: *"Our company is partly owned by an academic hospital and a big pharma company. And they hope to gain knowledge from this collaboration as well. So yes, definitely yes."* In other words, they are engaged in both the acquisition of resources, as well as the creation of a market for ArtMen's products.

4.4.3. Suppliers

Regarding suppliers, the initial purpose found in the interviews seems to be to supply materials, machines and tests to the start-ups. Thus, suppliers are engaged in the start-up's acquisition of tacit resources. But they also provide other types of resources. Some of the informants create knowledge in collaboration with suppliers. The CEO of BioPack even selects his suppliers based on their ability to co-develop: *"We have really developed things in collaboration with our suppliers. Because our product is very new. For example, new recipes. There are a lot of developments in chemistry and we need a supplier who really thinks with us."* qHeart also collaborated with suppliers to create technological knowledge: *"We did create knowledge with*

suppliers. We learned how things had to be produced and so on. This was knowledge we did not have and we created this knowledge together with suppliers."

4.4.4. Other collaborations

Other collaborations established by the interviewed start-ups are mostly aimed at creating and sharing contextual knowledge. However, these collaborations can also provide knowledge about competitors. For example in the case of Frontra: *"We were doing research with a Canadian doctor. This woman also tested our competitor's product. She told us the competitor's product was worthless. Sometimes this information is very easy to acquire."*

Furthermore, collaborations can lead to financial resources. As illustrated by the CEO of MicFlu: *"We are working in a consortium of four companies, which enabled us to apply to subsidies together."* Surlants experienced this as well, for them a collaboration with university professors lead to several grants: *"Their chances of getting funding increase when they involve companies like us. Preferably companies with something new and innovative."*

Additionally, collaborations can provide access to shared facilities, like in the case of MicFlu: *"We have the university as our partner and they are very willing to let us use their lab."* Furthermore, collaborations with the university can provide start-ups with human resources, as illustrated by the CEO of Surlants: *"We attract PhD students together with the professors."*

4.4.5. Undefined contacts

Finally, network contacts with no specific goal sometimes also provide knowledge about the industry and competitors. The CMO of ArtMen for example learned about competitor products from fellow surgeons: *"You get inside information from colleagues that have already used this product."* Insights from contacts can also lead to new opportunities regarding market positioning, for example in the case of MoBio: *"I heard from a company that they are looking at every failed product of the past thirty years. Because they feel like there could be some*

effective molecules that have been rejected in the past for some reason. … It could be possible that our technology can be of value for these products. Thus, I got an insight and I use it to create my own market."

4.5. Network capabilities

The interviews show that, as discussed in the previous paragraphs, a network is used and developed to serve three main goals: (1) acquiring resources; (2) acquiring a market position and (3) acquiring access to networks. This paragraph will discuss the four capabilities that start-ups seem to need to develop and use their network, to accomplish these goals. Since network capabilities are embedded in the organization, this paragraph covers factors that are within the start-up's sphere of influence.

4.5.1. Creating a balance between knowledge sharing and knowledge protection

Another capability that seems to be important in both network development and network use, is being open to external sources. Most of the informants try to gain as much knowledge as possible. As illustrated by the CMO of ArtMen: *"Yes, we collect as much information as possible. We try to take everything in like a sponge. Because everything that has already been done, we don't have to do again."* The CEO of MoBio has the same answer when asked about his openness to receive knowledge: *"Yes, absolutely. Like a sponge."*

However, most of the informants are careful in disclosing information, as illustrated by the CEO of MoBio: *"The knowledge we have is very sensitive to IP* [Intellectual Property]. *As long as we do not have IP, and we don't, we will communicate about it very minimally."* Even the CEO of S-Waves, who does have a patent registration for his product tries to not disclose too much information in conversations with a potential investor: *"We filed for patents, otherwise I wouldn't even talk about what we are doing. But even though I filed the patents, I'm not going to show everything."* The CMO of ArtMen is careful about disclosing information as well: *"We*

don't go to conferences to talk about how good our product is. We try to keep it in the lines. And we are careful with press and so on."

Not being open to share information, seems to prevent start-ups from not only developing new contacts, but also using these contacts to acquire knowledge resources. The CEO of BioPack has experienced this in the past: *"We don't want our knowledge to end up in competitor's hands. And this leads to, especially in the beginning, we were really closed. Doors were locked and no one was allowed to come in. This prevents you from open communication. In the past we have learned, and we are using our network more. In the beginning we were really closed, but there is a lot of knowledge and experience in the world."*

Therefore, a balance between being open towards external sources, in terms of mutual knowledge sharing, and protection of knowledge seems to be important. This suggests the following propositions:

Proposition 2a: Creating a balance between knowledge sharing and knowledge protection positively influences network development

Proposition 2b: Creating a balance between knowledge sharing and knowledge protection positively influences network use

4.5.2. Building and using knowledge about (potential) contacts

Knowledge about (potential) contacts seems to be important in both network use and development, especially regarding customers. The CMO of ArtMen for example uses the knowledge he has about potential customers in the development of relationships with these potential customers: *"I have been a doctor for 10 years, so I know hospitals, I know the people who work there and I know how things work there. ... In this perspective we have a head start. So I think we are faster than others in this."* Knowledge about contacts can also help in negotiations, as illustrated by the CMO of ArtMen: *"Hospitals want to renew and innovate. So*

we know what they want. ... That's your bargaining position. .. If I would not know this, then I would need to use other incentives, I would have to pay more."

For the CTO of qHeart, knowledge about customers helped in maintaining relationships with these customers: *"If you know someone's weaknesses, you can see if you can support them in that. If you know someone's strength, you can see in which ways you could strengthen these strengths. So yes these insights really helped."* For C-BioPharma, knowledge about customers is used to decide which services can be offered to which customers. For the CEO of MoBio, knowledge about contacts, particularly helps in using existing contacts to acquire certain resources, as well as in developing new contacts: *"... I memorize who knows what. And who has which contacts ..."*

The CEO of BioPack highlights that regarding big customers, it is hard to know their goals and strategies: *"You only talk to one or two persons, there can be a force from higher in the organization, that you don't know of. This can cause unexpected events."* The CEO of MoBio also experiences this when asked about his knowledge of the strengths and weaknesses of his potential customers: *"Regarding the pharmaceutical industry, you would have to look at each partner and this is not easy, because those are really big companies. Literally billion dollar companies."*

The previous examples suggest the following propositions:

Proposition 2c: building and using knowledge about (potential) contacts positively influences network development

Proposition 2d: building and using knowledge about (potential) contacts positively influences network use

4.5.3. Creating diversity within the start-up

Diversity in the start-up's founders or employees provides start-ups with different networks, which improves the start-up's ability to develop its network. The CMO of ArtMen supports this when asked if the founders different backgrounds influences the start-up's network: *"Yes, totally. We have engineering, medical and business backgrounds ... Yes, it definitely influences the network."* For MoBio, an employee's network lead to a collaboration: *"We have an English employee, who had a lot of good ideas on companies in England that could do tests for us. One of those companies is now working for us."* The CTO of qHeart also highlights the importance of diversity in network development: *"It brings different perspectives in the ecosystem."*

The previous fragments suggest the following proposition:

Proposition 2e: The creation of diversity in terms of expertise and nationality in the start-up's founders or employees positively influences network development

4.5.4. Coordination

All of the informants say they think it is important that knowledge and information is shared within the organization. However, the influence coordination between employees, projects and departments, has on networking behaviour was not clear in all cases. This influence seems to be more present in organizations that are or were more developed and especially seems to be important in using existing customer contacts. For example in the case of C-BioPharma: *"We try to communicate between projects ... This way we can involve customers for one department in a project from another department."* For qHeart, coordination was necessary to help customers: *"It was necessary. The sales team was in contact with the customers. And technology needed to know the needs customers have."* The CEO of BioPack has also experienced that coordination is important, so that problems in previous customer projects do not occur again in new customer projects: *"We are bigger now so we need to organize it more*

formally ... This and that went wrong. But we could have learned it there and there and there. So we need to have meetings about it somehow."

The previous fragments suggest the following proposition:

Proposition 2f: coordination positively influences network use

4.5.5. The role of the organisational development stage

Two of the previously mentioned capabilities seem to be influenced by the development stage the start-up is in. Namely, creating a balance between knowledge sharing and knowledge protection, and coordination.

The influence of creating a balance between knowledge sharing and knowledge protection seems to be dependent of the development stage an organization is in. Start-ups that are in the early stage of developing and testing their products are especially careful in disclosing information, but are very open to receiving knowledge. Start-ups that are further in product development seem to be more open to sharing their own knowledge.

Furthermore, coordination seems to be influenced by the development stage a start-up is in. Organization that are already in the stage of having customers seem to experience the influence of coordination in their use of existing customer contacts to a greater extent. The need for coordination seems to be higher in network use for more developed organizations.

Therefore, the following propositions are suggested:

Proposition 3a: the relationship between creating a balance between knowledge sharing and knowledge protection, and network development is influenced by the development stage the organization is in

Proposition 3b: the relationship between creating a balance between knowledge sharing and knowledge protection, and network use is influenced by the development stage the organization is in

Proposition 3c: the relationship between coordination and network use is influenced by the development stage the organization is in

4.6. Legitimacy

In this research, legitimacy is referred to as the (potential) contacts' perceived desirability of the start-up and its actions. This perceived desirability is important in developing contacts for start-ups, as it is often the only thing (potential) contacts can judge start-ups and their progression on. As illustrated by the CMO of ArtMen: *"All we do is use money and we don't sell anything, so our progression and the perception that people have of our progression is the only measure."*

Many of the informants experience the need to keep up their reputation. As illustrated by MoBio: *"We are a start-up, we can't make mistakes in the data we generate."* Since this perception is so important, they use the perception other contacts have, to try to convince potential contacts. As was the case for Surlants in acquiring grants and subsidies: *"We used our deal with a big investor in conversations with the province and The Hague"* and *"We received letters from potential customers saying they would like to use the product once it's finished. These letters are helpful in acquiring grants."* The CEO of S-Waves also highly invested in ways to show his product is legitimate, but still it does not seem like it is enough: "*We have a Health Technology Assessment. We have an official statement from an academic hospital in the US. I have started a second research with another hospital. Well, I think we have something good and ready for the next financing phase. But this person* [investment agency] *does not buy it."* The CEO of BioPack also invests in confirmations from partners: *"We had another organization research our lifecycle analysis. And we use this knowledge in the*

commercialization, to show our product is this, and other products are this." Like S-Waves and BioPack, most of the informants indicate that they do use reports or certificates to show legitimacy to new or existing contacts. This can be referred to as regulatory legitimacy, which is about the start-up complying to laws and regulations. Unlike the other informants, the CEO of BioPack is using press to gain legitimacy: *"We try to win prizes, with which we gain publicity."* Furthermore, BioPack sends newsletters to customers to inform them about prizes, which might lead to new projects with existing customers.

Legitimacy can also be gained from existing contacts. Having the right contacts seems to change the general perception of a company's desirability, which can lead to the development of new contacts. For instance in the case of S-Waves: *"I got to test my product in Dutch hospitals because I flew in my partner* [American doctor who is an investor and colleague]. *Because they don't believe me."* MicFlu also experienced this, for them, their relationship with the university is very important: *"We do say we are a university spin-off. People find a spin-off more interesting than a start-up, because this means it is based on validated research. A start-up might as well be the bakery around the corner."* Even the choice of customers can influence the perception people have of a company. *"We chose to focus on big customers. Because if you produce for, for example Microsoft, it can help if you go to another company and say you produce for Microsoft"* (CEO, BioPack). Also, employee relationships can have an effect on perceptions: *"One of our colleagues is currently studying at Harvard. And just mentioning this, makes people think: okay this is not bad"* (CEO, MicFlu). Furthermore, existing relationships with investors seem to be important in attracting new contacts, as the CEO of MoBio illustrates: *"What's very important in the case of investors, is to win the first one over. Once the first one is in, number two, three and four will follow much faster."* These examples show that associations can really influence perceptions. qHeart even managed to change people's perception by being associated with one of their own 'side' business models: *"We started*

organizing health conferences. Because our name was associated with these conferences, people saw us as a settled company in the market that had been active for two decades. ... In the customer's perception we were no longer a start-up, but a stable, legitimate, solid supplier."

All in all, the previous examples show that most of the interviewed entrepreneurs highly invest in showing (potential) contacts their legitimacy, which helps them with both the development of new contacts, as well as use of existing contacts. Subsequently, the informants highlight that legitimacy can be gained from existing contacts. Therefore, the following propositions are suggested:

Proposition 4a: Legitimacy positively influences network development

Proposition 4b: Legitimacy positively influences network use

Proposition 4c: Network use positively influences legitimacy

4.7. Incubator support

Most of the informants are or were involved in different incubator programmes, which mostly support start-ups with access to their network and office and/or lab space. In the table below an overview of the kinds of incubator support the start-ups have used, is shown.

Table 4. Types of incubator support

	ArtMen	qHeart	S-Waves	MoBio	Frontra	Surlants	ITPharma
Office and/or lab space	Yes	Yes	No	Yes	Yes	Yes	Yes
Coaching	No	No	Yes, start-up bootcamp	Yes, business plan	No	No	No
Network meetings	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Access to network	Subsidies	Subsidies Marketing	Assessment Potential supplier	Subsidies	Subsidies Suppliers	No	Potential customers

Most informants obtained office and/or lab space through the incubator. Most incubator programmes are situated at a campus where many start-ups are located. This specific location can be of influence on a start-ups network development. As illustrated by the CMO of ArtMen: *"When you're located at a campus like this, you talk to a lot of people and you will meet investors."* Frontra experienced something similar regarding suppliers: *"I was looking for a place where other companies were situated. And that went well, because through the campus we found our producer and our warehouse."*

For qHeart, the reputation a campus has was important in gaining publicity: *"We organized these conferences and we had an advantage because we organized it on this campus."* Furthermore, the incubator actively supported qHeart in gaining publicity: *"It was primarily support in networking and publicity. We have gotten in touch with tv and newspapers through the incubator. That really helped us."*

Another kind of incubator support that was experienced by most informants was the access to the network of the incubator. The CMO of ArtMen highlights the value of the incubator's network: *"They talk to a lot of people and every company has its own problems, but often also the same problems. They talk to all these companies. ... So they have general knowledge of who to contact for what."* The CEO of S-Waves supports this: *"The incubator's network brings a lot of opportunities. I found a potential supplier here."* The incubator's network was mostly used by the informants to get access to financial resources. The importance of the incubator support for access to financial resources is highlighted by the CEO MoBio: *"The incubator support at least accelerated our access to financial resources, and might have enabled it."*

Finally, incubator programmes often organize network meetings. Most of the informants do think these meetings help in developing a network, but to a certain extent. To the question if his network could have been like this, without incubator organized network meetings, the CEO of Frontra said: *"Yes, but it makes it easier."* The CMO of ArtMen supports this by saying: *"It*

has played its part in the bigger picture, but I don't think our network would have been completely different if they were not here. .... But, it is one of your network sources."

For most informants, the network meetings do support in developing network contacts. As illustrated by the CTO of qHeart: *"We were able to make contacts in the healthcare network and with financial institutions. So for our network this was good."* As well as by the CEO of S-Waves: *"I go to these meetings, purely for networking. And sometimes I hear interesting presentations. So for knowledge, as well as for networking."* The CEO of MoBio states that even though he does not think the specific contacts he needs attend the network meetings, the meetings can lead to new insights: "*We are now focused on finding customers for MoBio, and they are not here. But, on the other hand, I am very eager, because I'm enthusiastic, to talk about MoBio. Sometimes good ideas come from the most idiotic perspectives. So my experience is: talk about things and sometimes this comes with fantastic insights."*

Only two of the informants said they received coaching from the incubator. For example the the CEO of S-Waves: *"Yes I have been to some sort of start-up bootcamp. I don't think I learned much contextually, but it did help with my network."*

All in all, the incubator's support in network development, through office and/or lab space on a campus, network meetings and access to the network, was highlighted by the informants Therefore, the following proposition is suggested:

Proposition 5: Incubator support through providing access to the network, network meetings and office and/or lab space on a campus positively influences network development

4.8. Proximity

In the questionnaire, the informants were asked about the importance of five different types of proximity in the development of two specific contacts. The five types that were discussed are: cognitive, geographical, institutional, social and organizational proximity. Due to non-response

and measurement issues (the questions did not reflect the concept of proximity very well), the results are not clear for all types of proximity. However, with additional information from the interviews, two types of proximity were highlighted by the informants, namely cognitive and geographical proximity.

4.8.1. Cognitive proximity

Cognitive proximity is about similarity in expertise and experience in certain knowledge fields. Almost all the informants say similarity in expertise and/or experience influenced their decision to work or not work with a certain company or person.

For MoBio the expertise of an organization that provided funding was of influence in the decision to work with this organization: *"They know a lot about some topics in our business plan."* The same goes for Surlants, regarding a collaboration with a university professor: *"A professor needs to have sufficient knowledge to collaborate."* The CEO from S-Waves experienced that cognitive proximity was needed to convince a potential partner: *"I got to test my product in Dutch hospitals because I flew in my partner* [American investor and colleague]. *Because they don't believe me. ... My partner is a doctor and he talked to another doctor in this hospital, who then said: 'I want this'. ... So you do need people that speak each other's language. ... This definitely matters."* qHeart highlights that cognitive distance can be a challenge: *"Often it is hard to understand what a partner is thinking. If the partner is not a technical partner, he speaks another language. The healthcare language* [in this case]. *And healthcare has other perspectives on certain problems. It is a challenge to understand what is going on in this perspective. It's not always easy."*

These examples suggest the following propositions:

Proposition 6a: Cognitive proximity positively influences network development

*Proposition 6b: Cognitive proximity positively influences network use*

4.8.2. Geographical proximity

Geographical proximity is about literal closeness in terms of travel time and accessibility. For the CEO of Surlants, geographical proximity was important in a collaboration with a university professor: *"He is on 200 meters distance. Distance was definitely a criterium."* The CEO of S-Waves does acknowledge that geographical distance prevents him from meeting his partner. However, he does not see this as a big problem: *"My partner* [colleague] *and business angel is located in Washington DC. Travel time and costs do prevent us from seeing each other often, we only meet twice a year. We do talk a few times a month via the phone, skype and e-mail and for now this is enough."* The CEO of MoBio also indicates that, at least for his relationship with a funding agency, other forms of communication are sufficient: *"The distance is not a problem because we don't have to talk to each other that often. Besides, modern communication gives us enough space."* The CEO of Frontra does not see geographical distance as a problem in maintaining his international contacts in the USA, EU and India: *"Travelling is no problem once the relationship exists."* All in all, most of the informants do not really see geographical proximity as a criteria for either network use or development.

4.9. Conceptual model

The aforementioned propositions are illustrated in the conceptual model below.
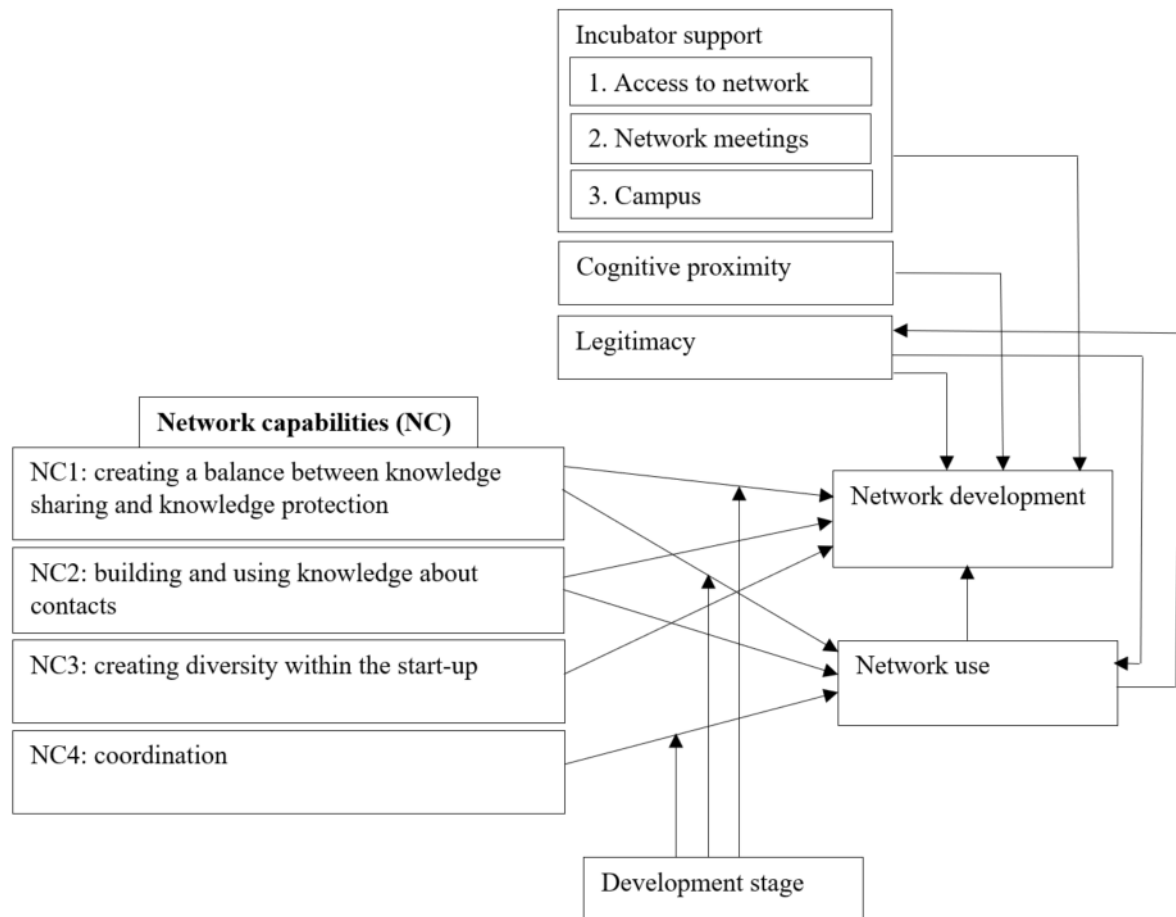
Chapter 5. Conclusion ⸺

The purpose of this research was to understand how start-ups in the chemical and life sciences and health industries develop and use their networks in order to contribute to sustainable radical innovations. More specifically, this research was focused on discovering capabilities that are needed in order to develop and use networks: network capabilities. Furthermore, the influence of incubator support, legitimacy and proximity was studied.

The research question is:

In what way can start-ups in the life sciences and health and/or chemical industries develop and use networks to realize sustainable radical innovations?

To answer this research question, eight entrepreneurs from start-ups in the life sciences & health industry, chemical industry and cross-overs between these industries were interviewed. Subsequently, two additional interviews were conducted. In this chapter, the main findings that resulted from the interviews will be discussed.

5.1. Start-up's networks

The interviews showed that start-up's networks are used and developed for three main goals: (1) acquiring resources; (2) acquiring a market position and (3) acquiring access to networks. Furthermore, the interviews showed that for start-ups, new contacts are mostly developed through existing contacts. In other words, existing contacts are used to get access to new networks. Another finding is that existing contacts serve many different goals, which might differ from the goal for which the contact was initially developed.

5.2. Network capabilities

Four capabilities that start-ups seem to need to develop and/or use their network, have been found: (1) creating a balance between knowledge sharing and knowledge protection; (2)

building and using knowledge about (potential) contacts; (3) creating diversity within the start-up and (4) coordination.

The first capability entails creating a balance between knowledge sharing and knowledge protection. The informants showed that they tried to collect as much knowledge as possible. However, they were quite careful in sharing their own knowledge, which seems to prevent them from not only developing new contacts, but also using these contacts to acquire knowledge. Therefore, creating a balance between knowledge sharing and knowledge protection seems to be important in both network development and network use. The influence of this capability seems to be dependent of the development stage an organization is in. Start-ups that are in the early stage of developing and testing their products are especially careful in disclosing information, but are very open to receiving knowledge. Start-ups that are further in product development seem to be more open to sharing knowledge.

The second capability is building and using knowledge about existing or potential contacts. This capability seems to especially be important in the development and use of customer contacts. Knowledge about potential customers can for example help in negotiating with these customers, since being aware of the customers' goals can improve a start-up's bargaining position. Furthermore, knowledge about current customers is important in network use. It can help in maintaining relationships with customers, by responding to customer needs. Furthermore, being aware of the knowledge and network a partner has, can help in using existing contacts to acquire resources or access to new networks.

The third capability concerns creating diversity within the start-up. Diversity in this research refers to different backgrounds in terms of expertise and nationality. This diversity can give access to different networks and therefore positively influences network development.

The last capability: coordination, especially seems to be important in network use regarding customer relationships. Coordination between project groups or departments is necessary to prevent repeating mistakes and to communicate the customer's needs. This capability also seems to be influenced by the development stage a company is in. In more developed organizations, internal communication seems to be experienced to a greater extent.

5.3. Legitimacy

The results show that most of the informants highly invest in showing potential contacts that they are legitimate, which helps them in network development and use. Furthermore, legitimacy can be gained from existing contacts. Having the right contacts can change the perception potential partners have of a start-up. For example regarding investors: once a start-up is invested in by others, potential investors might be more likely to invest as well, because others already believe in the business. Therefore, legitimacy is believed to be enhanced by network use.

5.4. Incubator support

Incubator programmes can provide start-ups with access to a broad network. Not only does the incubator directly connect the start-ups to potential contacts, but the fact that most incubator programmes provide start-ups with office and/or lab space on some sort of campus, also gives access to new contacts. The incubator's network is mostly used to get access to financial resources, for example through meetings with financial institutions. Furthermore, network meetings organized by incubators support start-ups in developing their network.

5.5. Cognitive proximity

Cognitive proximity, which is about similarity in expertise and experience in certain knowledge fields, seems to be important in network development and use. The results highlighted that speaking the same 'language', for example the healthcare language, is important in network development and use.

5.6. Contextual differences

Start-ups from different industries and with different levels of success were interviewed. No

differences in networking behaviour between industries and levels of success were found.

Chapter 6. Discussion

This research provides a new perspective on networking behaviour, in the context of start-ups in the life sciences & health and chemical industries. Furthermore, it shows the importance of legitimacy in network development for start-ups in this context. Additionally, even though previous studies have generated conflicting results regarding the influence of incubator support. This research shows that in this context, incubator support does play a role in network development for start-ups. Also, cognitive proximity is shown to be important in developing new contacts. However, more research is needed to study the influence of other types of proximity.

6.1. Theoretical implications

Previous literature on networking behaviour has introduced different perspectives on network capabilities. The ability to develop and use networks has been referred to in different terms and with slightly different definitions. Furthermore, in previous studies the dimensions underlying network capabilities vary.

Whereas multiple studies proposed relational skills as a network capability (Lechner and Dowling, 2003; Walter et al., 2006), it was not highlighted as a network capability in this research. Even though all the informants did confirm that they thought they had sufficient relational skills, the effect it had on their networking behaviour was not clear. This might be because asking informants directy about their own relational skills, might not be a very sufficient and objective measure.

Another network capability that was emphasized in previous literature was absorptive capacity (Lechner and Dowling, 2003), which entails "the ability to recognize the value of new external information, assimilate it and apply it to commercial ends" (Cohen and Levinthal, 1990, p. 128). The results did show that it is important to be open towards external information. However, this

research proposes that there should be a balance between knowledge sharing (both acquisition and disclosion) and knowledge protection. The assimilation and commercialization of knowledge, was found to be important for start-ups in general, but no clear effect on networking behaviour was found.

Furthermore, systemization of knowledge is one of the network capabilities that was found in previous research (Gebauer et al., 2012; Van den Bosch et al, 1999). Although the informants did find knowledge sharing within the organization important, none of the start-ups had implemented routines to systemize knowledge. This could also be explained by the fact that smaller organizations do not require such systems, as spreading knowledge over fewer people generally demands less coordination. Coordination in general however was highlighted as a network capability.

Incubator support was expected to have a moderating effect on the relationship between network capabilities and network development and use. However, the results did not reflect this kind of relationship. Even though the incubator did help in network development, the results did not show that the incubator really facilitated the exploitation of network capabilities for network development and use. Furthermore, no effect on network use was found, which might be explained by the fact that few of the start-ups have received or participated in coaching by the incubator.

Legitimacy was also expected to influence the relationship between network capabilities and network development and use. This moderating effect was not reflected in the results, which might be explained by the fact that the degree of legitimacy was not measured. However, legitimacy was found to be very important in network development and use.

Additionally, previous research has emphasized the importance of geographical proximity in facilitating interactions. Therefore, it was assumed to influence network development and use.

However, most of the informants indicated that they do not see geographical distance as as problem. Even though some previous research has taken modern communication into account, this result might be explained by further technological advancements in communication.

6.2. Limitations & recommendations

This research has a number of limitations. Firstly, whereas the aim of this research was to explore start-up's networking behaviour, the generalizability of this research is limited. All interviewed start-ups are located in the Netherlands and only a small number of cases was studied. Furthermore, due to to low accessibility to start-ups in the chemical industry, only two interviews were conducted in this context, of which one was with an entrepreneur from a more matured company. This might also explain why no clear differences between the three industry categories were found. Therefore, it is recommended to conduct quantitative research on a bigger scale and in different contexts to find out if the findings of this research can be confirmed.

Secondly, networking behaviour of start-ups who received incubator support could not be compared with start-ups that did not receive any incubator support. Due to low accessibility of "independent" start-ups, most of the interviewed entrepreneurs were involved in an incubator programme. Therefore, it is recommended to incorporate both independent as well as incubated start-ups in future research.

Thirdly, the questionnaire that was sent to the entrepreneurs in order to map their individual networks, appeared to be not very clear, which resulted in incomplete answers. Furthermore, the questionnaire included questions on proximity, which did not reflect the concept very well. The answers to these questions could only be used to a limited degree, consequently, only two types of proximity could be studied sufficiently. Therefore, it is recommended to further explore the concept of proximity in future research.

Fourthly, this research does not take the personality of entrepreneurs into account, while this could be important in networking behaviour, since a start-up often only consists of a few employees. Therefore, the entrepreneur's personality should be incorporated in future research.

Lastly, this research has only studied networking behaviour from the perspective of the start-up. However, since networking behaviour is also dependent on the (potential) contacts, certain external factors might have been overlooked. Additionally, this research has shown that legitimacy is very important in network development and use, however, the degree of legitimacy in the eyes of the (potential) contact was not measured. Therefore, it is suggested to explore the (potential) contact's perspective in future research.

6.3. Managerial implications

This research holds several managerial implications for both start-ups and incubator programmes.

6.3.1. For start-ups

For start-ups, one of the insights they could gain from this research is to create diversity within the start-up. Employees from multiple backgrounds, regarding expertise and nationality, can provide the start-up with new opportunities through the different networks this diversity brings. Furthermore, entrepreneurs should try to gain knowledge about (potential) contacts. Knowledge about potential contacts can help in negotiating with these contacts. Knowledge about existing contacts can help to really use the contacts for multiple goals, as different types of contacts can serve many different purposes. Additionally, entrepreneurs should pay attention to creating a balance between knowledge sharing and knowledge protection, as it helps them to optimally acquire new knowledge resources through network contacts. Furthermore, entrepreneurs should encourage coordination between departments, project groups and employees, especially when they are more developed and in the stage of having more customers. Subsequently, investing in

showing legitimacy, through for example assessments or reports, can help start-ups in network development. Lastly, joining an incubator programme, preferably on a campus, could be helpful for start-ups in getting access to new networks. Concluding, start-ups should try to be more aware of their networking behaviour, because their network and the network of their contacts can bring many opportunities.

6.3.2. For incubator managers

Even though the incubator is already very helpful by providing access to its network, network meetings and office and lab space, one insight is that the incubator should invest in coaching the start-ups. The incubator should make the start-up more aware of its networking behaviour and legitimacy. Furthermore, the incubator can coach the start-up on the four network capabilities and focus on how these capabilities can be developed. Additionally, the incubator can help start-ups through providing tools, for example aimed at network mapping, so that they become more aware of their own network and the purposes it can serve.

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Appendices

Appendix A. Operationalization

Dependent variables

Network development	
Construct	**Indicators**
Network development (based on Lorange et al., 1992; Scarbrough et al., 2013;)	Selecting potential relationships
	Evaluating potential relationships
	Negotiating and agreeing on terms

Network use (goals)	
Construct	**Indicators**
Network use (goals) (based on Baum et al., 2000; Elfring and Hulsink, 2006)	Acquiring resources
	Gaining legitimacy
	Spotting new opportunities
	Efficient network management

Independent variables

Network capabilities		
Construct	**Dimensions**	**Indicators**
Relational capability (Walter et al., 2006)	Coordination	Analysis of desired achievements with partners
		Matching the use of resources to the individual relationship
		Knowledge of partners' goals, potentials and strategies
		Judge in advance which possible partners are

		preferred for building a relationship
		Appoint coordinators who are responsible for relationships
		Regularly discussing with partners how to support each other
	Relational skills	Ability to build personal relationships
		Ability to relate to partners
		Ability to deal flexibly with partners
		Ability to solve problems with partners
	Partner knowledge	Knowledge of partner markets
		Knowledge of partner products/procedures/services
		Knowledge of partner strengths and weaknesses
		Knowledge of competitor potential and strategies
	Internal communication	Regular meetings
		Informal contact
		Communication across projects/subjects
		Feedback
		Spontaneous exchange of information
Absorptive capacity (Gebauer et al., 2012)	Explorative learning processes	Recognition of external knowledge sources

		Engagement in joint knowledge-creation projects
		Regularity of meetings with externals
		Motivation to use external knowledge sources
		Identification of new knowledge in external sources
		Generating information on business environment relevant to new business opportunities
		Acquisition of knowledge through various sources
		Selecting and retaining knowledge obtained from external sources
		Classifying and internalizing acquired knowledge
	Assimilative learning processes	Shared interpretation of the newly acquired knowledge
		Discussion of the acquired knowledge
		Achieving collective understanding of the acquired knowledge
		Integration of new knowledge into firm's knowledge base
		Dissemination of new knowledge throughout the firm

		Using tools for spreading knowledge throughout the firm
	Transformative learning processes	Maintaining and reactivating knowledge
		Creation of new knowledge based on the acquired knowledge
		Reconstructing acquired knowledge
		Facilitating transference and novel associations concerning the knowledge
		Discursive interpretation of knowledge
		Adding new knowledge to the acquired knowledge
		Constructive combination and re-combination of knowledge
		Linking existing knowledge with new insights
	Exploitative learning processes	Transmute knowledge into commercial applications
		Applying knowledge to commercial purpose
		Launching innovations to the market
		Converting innovative ideas into commercial applications
		Using generated and disseminated knowledge in market activities

Combinative capability (Van den Bosch et al., 1999; Gebauer et al., 2012)		Engaging product or service innovations
		Commercial use of knowledge
Combinative capability (Van den Bosch et al., 1999; Gebauer et al., 2012)	Systemization	Degree of formalising knowledge
		Degree of routinisation for systemising knowledge
	Coordination	Degree of cross-functional interfaces
		Degree of participation in decision-making processes
	Socialization	Intensity of social relations
		Density of social linkages
		Shared social experiences
		Gender diversity
		Diversity of role understanding and attitudes

Other factors

Legitimacy		
Construct	**Dimensions**	**Indicators**
Legitimacy (Zimmerman & Zeitz, 2002)	Regulatory legitimacy	Compliance with laws
		Compliance with regulations
	Normative legitimacy	Addressing societal norms and values

Incubator support	
Construct	**Indicators**
Incubator support (Hansen et al., 2000)	Funding
	Coaching
	Office space
	Common services
	Organized networking

Proximity		
Construct	**Dimensions**	**Indicators**
Proximity (Werker, Ooms and Caniëls, 2016)	Geographical proximity	Travel time
		Accessibility
	Institutional proximity	Similarity in country/region-specific regulations
		Similarity in culture
	Cognitive proximity	Similarity in expertise in specific knowledge fields
		Similarity in experience in specific knowledge fields
	Social proximity	Embeddedness in similar knowledge fields
		Member of similar professional associations
		Member of similar social communities
	Organizational proximity	Similar organizational objectives
		Similar organization-specific formal rules and regulations
		Similar organization culture

Strength of relationships		
Construct	Dimensions	Indicators
Strength of relationships (Baer, 2010)	Frequency	
	Duration	
	Closeness	

Appendix B – Online questionnaire previous to the interview

1. English

Introduction

The purpose of this questionnaire is to specify and add to the questions for the upcoming interview. When asked about contacts, all possible contacts that are or have been part of your organization's network. This includes for example relationships with suppliers, customers, investors, partners, the government, universities, former colleagues and family.

You will be asked to describe a number of contacts. You can but you do not have to mention any names. Existing or former contacts can be mentioned. Up to 15 contacts can be filled in, it would be nice if you could describe at least 6 contacts.

Examples:

1. Can you describe a contact and indicate what the purpose of the relationship is/was?

At the start of my company I was in contact with another entrepreneur who started a business in the same sector a couple years ago. He helped me with some practical things, like writing the business plan and applying for patents.

How did you meet this person/company?

I was introduced to him by a university professor in science.

2. Can you describe a contact and indicate what the purpose of the relationship is/was?

One of our customers is the Jeroen Bosch hospital. I am in contact with the manager of the urology department.

How did you meet this person/company?

I was introduced to him by a former colleague.

Part 1:

1. What is the name of your organization?

2. How many employees does/did your organization have?

3. Can you describe a contact and indicate what the purpose of the relationship is/was?

4. How did you meet this person/company?

5. How often are you in contact with this person/company?

	Never	Once a year	Few times a year	Once a month	Few times a month	Few times a week	Daily
Contact	○	○	○	○	○	○	○

6. How long has the relationship existed? (weeks/months/years)

7. How close are you with this contact?

	Not close at all	Not close	Neutral	Close	Very close
Closeness	○	○	○	○	○

Part 2:

The following questions are about two specific contacts. You will be asked to choose one successful and one less successful relationship. It is about what you see as successful or not successful. An example of an unsuccessful relationship can be one that has disappointed you. The contacts mentioned can overlap with contacts you have mentioned in part 1.

Contacts can be for example current or former suppliers, customers, partners, investors etcetera. You do not have to mention any names.

Successful

1. Can you describe a contact that is/was successful? What is/was the purpose of the relationship?

2. Why did you decide to work with this person/company?

3. Where is this person/company situated? Did distance (travel time/accessibility) influence your decision to work with this person/company? Why (not)?

4. Did national laws and regulations influence your decision to work with this person/company? Why (not)?

5. Did culture influence your decision to work with this person/company? Why (not)?

6. Did this person/company's expertise influence your decision to work with this person/company? Why (not)?

7. Did this person/company's experience influence your decision to work with this person/company? Why (not)?

8. Did the knowledge fields this person/company is in influence your decision to work with this person/company? Why (not)?

9. Did the involvement of this person/company in professional associations influence your decision to work with this person/company? Why (not)?

10. Did the involvement of this person/company in social associations influence your decision to work with this person/company? Why (not)?

11. Did this company's goals or ambitions influence your decision to work with this person/company? Why (not)? (if applicable)

12. Did this company's regulations influence your decision to work with this person/company? Why (not)? (if applicable)

13. Did this company's organizational culture influence your decision to work with this person/company? Why (not)? (if applicable)

Unsuccessful

1. Can you describe a contact that is/was successful? What is/was the purpose of the relationship?

2. Why did you decide to work with this person/company?

3. Where is this person/company situated? Did distance (travel time/accessibility) influence your decision to work with this person/company? Why (not)?

4. Did national laws and regulations influence your decision to work with this person/company? Why (not)?

5. Did culture influence your decision to work with this person/company? Why (not)?

6. Did this person/company's expertise influence your decision to work with this person/company? Why (not)?

7. Did this person/company's experience influence your decision to work with this person/company? Why (not)?

8. Did the knowledge fields this person/company is in influence your decision to work with this person/company? Why (not)?

9. Did the involvement of this person/company in professional associations influence your decision to work with this person/company? Why (not)?

10. Did the involvement of this person/company in social associations influence your decision to work with this person/company? Why (not)?

11. Did this company's goals or ambitions influence your decision to work with this person/company? Why (not)? (if applicable)

12. Did this company's regulations influence your decision to work with this person/company? Why (not)? (if applicable)

13. Did this company's organizational culture influence your decision to work with this person/company? Why (not)? (if applicable)

2. Dutch

Introduction

Deze vragenlijst is bedoeld om het interview dat binnenkort gepland staat te specificeren en aan te vullen. Wanneer er gevraagd wordt naar een relatie worden hiermee alle mogelijke relaties die onderdeel zijn of zijn geweest van het netwerk van uw bedrijf bedoeld. Het gaat bijvoorbeeld om relaties met leveranciers, klanten, investeerders, partners, de overheid, universiteiten, voormalige collega's en familie.

Er zal gevraagd worden of u een aantal relaties kunt omschrijven, hierbij hoeft u geen namen van bedrijven of personen te noemen (dit mag wel), het gaat vooral om de aard van de relatie. Er mogen zowel bestaande relaties als voormalige relaties genoemd worden. Er kunnen 15 relaties ingevuld worden, het zou fijn zijn als u er minimaal 6 kunt invullen.

Voorbeeldantwoorden:

1. Kunt u een relatie beschrijven en aangeven waarvoor deze relatie dient/heeft gediend?

Bij de opstart van mijn bedrijf heb ik veel contact gehad met een andere ondernemer die een aantal jaren geleden is begonnen met een start-up in dezelfde sector. Hij heeft mij geholpen met een aantal praktische zaken, waaronder het schrijven van een business plan en het aanvragen van een patent.

Hoe bent u met deze persoon/dit bedrijf in contact gekomen?

Ik ben met hem in contact gekomen via een hoogleraar scheikunde van de universiteit.

2. Kunt u een relatie beschrijven en aangeven waarvoor deze relatie dient/heeft gediend?

Een van onze klanten is het Jeroen Bosch Ziekenhuis. Ik heb contact met de Manager van de Urologie afdeling.

Hoe bent u met deze persoon/dit bedrijf in contact gekomen?

Ik ben aan deze persoon voorgesteld door een voormalig collega.

Part 1:

1. Van welke organisatie bent u?

2. Hoeveel werknemers heeft/had uw organisatie in totaal?

3. Kunt u een relatie beschrijven en aangeven waarvoor deze relatie dient/heeft gediend?

4. Hoe bent u met deze persoon/dit bedrijf in contact gekomen?

5. Hoe vaak heeft/had u contact met deze relatie?

	nooit	1 keer per jaar	een paar keer per jaar	1 keer per maand	een paar keer per maand	een paar keer per week	dagelijks
Contact	○	○	○	○	○	○	○

6. Hoe lang bestaat/bestond de relatie? (in weken/maanden/jaren)

7. Hoe 'close' voelt/voelde u zich met deze relatie?

	Helemaal niet close	Niet close	Neutraal	Close	Heel close
Closeness	○	○	○	○	○

Part 2:

De volgende vragen gaan over twee relaties in het bijzonder. Er wordt gevraagd om één succesvolle en één minder succesvolle relatie te kiezen. Het gaat hier om wat u beschouwt als succesvol of onsuccesvol. Een voorbeeld van een onsuccesvolle relatie kan een relatie zijn die u teleurgesteld heeft. Deze relaties mogen overlappen met relaties die u hierboven ingevuld heeft.

Onder relaties vallen bijvoorbeeld huidige of voormalige leveranciers, klanten, partners, investeerders etc. U hoeft geen namen van personen of bedrijven te noemen.

Succesvol

1. Kunt u een relatie noemen die volgens u succesvol is/was? Waarvoor dient/diende deze relatie?

2. Waarom besloot u met deze persoon/dit bedrijf samen te werken?

3. Waar bevindt deze persoon/dit bedrijf zich? Heeft/had afstand (reistijd/bereikbaarheid) invloed op uw beslissing om met deze persoon/dit bedrijf te werken? Waarom wel/niet?

4. Hebben landelijke regels en wetten invloed (gehad) op uw beslissing om met deze persoon/dit bedrijf te werken? Waarom wel/niet?

5. Heeft cultuur invloed (gehad) op uw beslissing om met deze persoon/dit bedrijf te werken? Waarom wel/niet?

6. Heeft de expertise van deze persoon/dit bedrijf invloed (gehad) op uw beslissing om met deze persoon/dit bedrijf te werken? Waarom wel/niet?

7. Heeft de ervaring van deze persoon/dit bedrijf invloed (gehad) op uw beslissing om met deze persoon/dit bedrijf te werken? Waarom wel/niet?

8. Hebben de kennisvelden waarin deze persoon/dit bedrijf zich bevindt invloed (gehad) op uw beslissing om met deze persoon/dit bedrijf te werken? Waarom wel/niet?

9. Heeft de betrokkenheid van deze persoon/dit bedrijf bij professionele verenigingen/organisaties invloed (gehad) op uw beslissing om met deze persoon/dit bedrijf te werken? Waarom wel/niet?

10. Heeft de betrokkenheid van deze persoon/dit bedrijf bij sociale verenigingen/organisaties invloed (gehad) op uw beslissing om met deze persoon/dit bedrijf te werken? Waarom wel/niet?

11. Hebben de doelen/ambities van dit bedrijf invloed (gehad) op uw beslissing om met dit bedrijf te werken? Waarom wel/niet? (als van toepassing)

12. Heeft het reglement van dit bedrijf invloed (gehad) op uw beslissing om met dit bedrijf te werken? Waarom wel/niet? (als van toepassing)

13. Heeft de organisatiecultuur van dit bedrijf invloed (gehad) op uw beslissing om met dit bedrijf te werken? Waarom wel/niet? (als van toepassing)

Onsuccesvol

1. Kunt u een relatie noemen die volgens u minder succesvol of onsuccesvol is/was? Waarvoor dient of diende deze relatie? (dit mag een beëindigde relatie zijn)

2. Waarom besloot u met deze persoon/dit bedrijf samen te werken?

3. Waar bevindt deze persoon/dit bedrijf zich? Heeft/had afstand (reistijd/bereikbaarheid) invloed op uw beslissing om wel of niet met deze persoon/dit bedrijf te werken? Waarom wel/niet?

4. Hebben landelijke regels en wetten invloed (gehad) op uw beslissing om wel of niet met deze persoon/dit bedrijf te werken? Waarom wel/niet?

5. Heeft/had cultuur invloed op uw beslissing om wel of niet met deze persoon/dit bedrijf te werken? Waarom wel/niet?

6. Heeft/had de expertise van deze persoon/dit bedrijf invloed op uw beslissing om wel of niet met deze persoon/dit bedrijf te werken? Waarom wel/niet?

7. Heeft/had de ervaring van deze persoon/dit bedrijf invloed op uw beslissing om wel of niet met deze persoon/dit bedrijf te werken? Waarom wel/niet?

8. Hebben de kennisvelden waarin deze persoon/dit bedrijf zich bevindt invloed (gehad) op uw beslissing om wel of niet met deze persoon/dit bedrijf te werken? Waarom wel/niet?

9. Heeft/had de betrokkenheid van deze persoon/dit bedrijf bij professionele verenigingen/organisaties invloed op uw beslissing om wel of niet met deze persoon/dit bedrijf te werken? Waarom wel/niet?

10. Heeft/had de betrokkenheid van deze persoon/dit bedrijf bij sociale verenigingen/organisaties invloed op uw beslissing om wel of niet met deze persoon/dit bedrijf te werken? Waarom wel/niet?

11. Hebben de doelen/ambities van dit bedrijf invloed (gehad) op uw beslissing om wel of niet met dit bedrijf te werken? Waarom wel/niet? (als van toepassing)

12. Heeft het reglement van dit bedrijf invloed (gehad) op uw beslissing om wel of niet met dit bedrijf te werken? Waarom wel/niet? (als van toepassing)

13. Heeft de organisatiecultuur van dit bedrijf invloed (gehad) op uw beslissing om wel of niet met dit bedrijf te werken? Waarom wel/niet? (als van toepassing)

Appendix C - Interview questionnaire

(format that was used as a basis for the (unstandardized and semi-structured) interviews, for entrepreneurs from terminated organizations the past tense was used)

1. Interview questions (English)

Introduction

This interview will be used for my Master Thesis about start-ups and networks. Your name and your company's name will not be mentioned in the report and the information you have given me will be treated carefully.

Case description

1. Can you tell me something about your background?
2. Can you describe your company?
3. For how long does your company exist?

When asked about relationships or partners, all possible relationships are meant. These can be suppliers, customers, collaborations, former colleagues, investors, family, government etcetera.

Part A

Network development

1. Can you describe how you select potential relationships?
2. Can you describe how you evaluate potential relationships?
3. Can you describe how you negotiate about contracts?
4. Do you think you are successful in developing networks? Why?

Network use

1. Can you describe how you acquire resources through your network?
       (financial resources, knowledge, employees etc.)
2. Do you think you have gained legitimacy through your network? How?

(Legitimacy = "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs and definitions")

3. Can you describe how you use your network to spot new opportunities?

    (new customers, new markets, new partners, new products)

4. Can you describe how you manage your network?

5. Do you think you are successful in using networks? Why?

Part B

Relational capability

Coordination

1. Do you actively analyse what you would like to achieve with which partner? How does this help you?

2. Do you match the use of resources to the individual relationship? How does this help you?

3. Do you inform yourselves of your partners' goals, potentials and strategies? How does this help you?

4. Do you judge in advance which partners you would like to build relationships with? How does this help you?

5. Do you appoint coordinators who are responsible for partner relationships? How does this help you?

6. Do you regularly discuss with your partners how you can support each other? How does this help you?

Relational skills

1. Do you feel like you are able to build good personal relationships with business partners? How does this help you?

2. Do you feel like you can put yourselves in your partners' position? How does this help you?

3. Do you feel like you can flexibly deal with your partners? How does this help you?

4. Do you solve problems with partners constructively? How does this help you?

Partner knowledge

1. To what extent do you feel like you know your partners' markets? How does this help you?
2. To what extent do you feel like you know your partners' products/procedures/services? How does this help you?
3. To what extent do you feel like you know your partners' strengths and weaknesses? How does this help you?
4. Do you feel like you know your competitors' potentials and strategies? How does this help you?

Internal communication

1. Do you have regular meetings for every project? How does this help you?
2. Do employees/colleagues develop informal contacts among themselves? How does this help you?
3. Do you feel like communication is across projects and subject areas? How does this help you?
4. Do you and your colleagues/employees give each other feedback? How does this help you?
5. Do you and your colleagues/employees spontaneously exchange information? How does this help you?

Absorptive capacity

Explorative learning processes

1. Are you open towards external knowledge sources? How does this help you? Can you give an example?
2. Do you feel like you are able to recognize knowledge in external sources? If yes, through various sources?
3. Do you regularly meet with externals?
4. Do you engage in joint knowledge-creation projects?
5. Do you generate information on the business environment relevant to new business opportunities (industry information and trends)?

Assimilative learning processes

1. Do you feel like you and your team have a shared interpretation of the newly acquired knowledge? How does this help you?
2. Do you and your team discuss the acquired knowledge? How does this help you?
3. Do you integrate new knowledge into a firm's knowledge base? How does this help you?
4. Do you disseminate new knowledge throughout the firm? How does this help you?
5. Do you use tools for spreading knowledge throughout the firm? How does this help you?

Transformative learning processes

1. Do you interpretate knowledge discursively?
2. Do you maintain and reactivate knowledge? How does this help you?
3. Do you create new knowledge based on the acquired knowledge? Can you give an example? How does this help you?
4. Do you link existing knowledge with new insights? How does this help you?

Exploitative learning processes

1. Do you apply knowledge to commercial purposes? How does this help you?

Combinative capability

Systemization

1. Is your knowledge formalized? (procedures, methods, templates) Why (not)? How does this help you?
2. Do you have routines for knowledge systemization? (flexibility on templates, procedures, methods) Why (not)? How does this help you?

Coordination

1. Does everyone have their own specific tasks? Do you rotate tasks? How does this help you?
2. Do you communicate across different functions? How does this help you?
3. Who in your organization participates in decision making? How does this help you?

Socialization

1. Can you describe how intense social relations are within your organization? How does this help you?

2. Do the members of your organization differ in backgrounds? (education, gender: man-woman rate, cultural background etc.) How does this help you?

Part C

Incubator

Funding

1. Have you received funding through your incubator programme?

2. Do you think you could have been successful without this funding?

Coaching

3. Have you received coaching through your incubator programme?

4. Do you think you would have been successful without this coaching?

Office space

5. Have you received office space through your incubator programme?

6. Do you think you would have been able to find office space without your incubator programme?

Common services

7. Do you have the possibility to use common services? (such as labs etc.)

8. Do you think you would have been able to get this possibility without your incubator programme?

Organized networking

9. Does your incubator programme actively organize networking? (meetings etc.)

10. Do you think you would have been able to meet as many people without your incubator?

Legitimacy

- *Regulatory legitimacy: compliance with laws and regulations*

    1. Do you have a health technology assessment report or something similar?

- *Normative legitimacy: addressing societal norms and values*

    2. Are you actively engaged in corporate social responsibility?

2. Interview questions (Dutch)

Introductie

Dit interview zal gebruikt worden voor mijn Master Thesis over start-ups en netwerken. Uw naam en de naam van uw bedrijf zullen niet genoemd worden in het verslag en er zal zorgvuldig omgegaan worden met de informatie die u mij gegeven heeft.

Case beschrijving

4. Kunt u me iets vertellen over uw achtergrond?
5. Kunt u beschrijven wat uw bedrijf doet?
6. Hoe lang bestaat uw bedrijf?

<u>Part A</u>

Wanneer er gevraagd wordt naar relaties of partners worden hiermee alle mogelijke relaties bedoeld. Dit kan gaan over leveranciers, klanten, samenwerking, voormalig collega's, investeerders, familie, overheid etc.

Network development

5. Kunt u beschrijven hoe u potentiële relaties selecteert?
6. Kunt u beschrijven hoe u potentiële relaties evalueert?
7. Kunt u beschrijven hoe u onderhandelt over contracten?
8. Denkt u dat u succesvol bent in het ontwikkelen van relaties? Waarom?

Network use

6. Kunt u beschrijven hoe u 'resources' verkrijgt via uw netwerk?
   (financieel, kennis, werknemers etc.)
7. Denkt u dat u legitimiteit verkrijgt via uw netwerk? Hoe?
   (Legitimiteit = de algemene perceptie of assumptie dat de dingen die u doet 'goed' zijn "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs and definitions")
8. Kunt u beschrijven hoe u uw netwerk gebruikt om nieuwe mogelijkheden te ontdekken?
   (nieuwe klanten, nieuwe markten, nieuwe producten, nieuwe partners)
9. Kunt u beschrijven hoe u uw netwerk managet? (onderhouden van relaties)

10. Denkt u dat u succesvol bent in het gebruiken van uw netwerk? Waarom?

<u>Part B</u>

Relational capability

    Coordination

7. Analyseert u bewust wat u wilt bereiken met uw partners? Hoe helpt dit u?
8. Koppelt u het gebruik van 'resources' (tijd, geld etc.) aan de individuele relatie? Hoe helpt dit u?
9. Bent u op de hoogte van uw partners doelen, potentieel en strategieën? Hoe helpt dit u?
10. Beoordeelt u van tevoren met welke personen/bedrijven u een relatie zou willen opbouwen? Hoe helpt dit u?
11. Wijst u coördinators aan die verantwoordelijk zijn voor bepaalde partners? Hoe helpt dit u?
12. Discussieert u regelmatig met uw partners over hoe jullie elkaar kunnen helpen? Hoe helpt dit u?

    Relational skills

5. Heeft u het gevoel dat u in staat bent om goede persoonlijke relaties op te bouwen met partners? Hoe helpt dit u?
6. Heeft u het gevoel dat u uzelf in uw partner kunt verplaatsen? Hoe helpt dit u?
7. Heeft u het gevoel dat u flexibel kunt omgaan met partners? Hoe helpt dit u?
8. Lost u problemen met partners constructief op? Hoe helpt dit u?

Partner knowledge

5. In hoeverre bent u op de hoogte van uw partners markten? Hoe helpt dit u?
6. In hoeverre bent u op de hoogte van uw partners producten/procedures/services? Hoe helpt dit u?
7. In hoeverre kent u uw partners sterktes en zwaktes? Hoe helpt dit u?
8. In hoeverre kent u het potentieel en de strategieën van uw concurrentie? Hoe helpt dit u?

Internal communication

6. Heeft u regelmatige meetings voor elk project? Hoe helpt dit u?

7. Gaan uw werknemers/collega's informeel met elkaar om? Hoe helpt dit u?

8. Wordt er gecommuniceerd tussen werknemers met verschillende projecten en werkvelden? Hoe helpt dit u?

9. Geven u en uw collega's/werknemers elkaar feedback? Hoe helpt dit u?

10. Wisselen u en uw collega's/werknemers spontaan informatie uit? Hoe helpt dit u?

Absorptive capacity

In de volgende vragen heb ik het over kennis, hiermee wordt kennis in het ruime begrip bedoeld. Dit kan zijn kennis over technologieën, kennis over de industrie, kennis over praktische bedrijfszaken etc.

Explorative learning processes

6. Bent u open naar externe kennisbronnen? Hoe helpt dit u? Heeft u hier een voorbeeld van?

7. Denkt u dat u in staat bent om kennis te herkennen in externe bronnen? En zo ja, in verschillende bronnen?

8. Werkt u wel eens samen met andere partijen om kennis te creëren?

9. Heeft u regelmatig afspraken met externen?

10. Verzamelt u informatie over de industrie en externe omgeving? (trends etc., wat andere bedrijven doen)

Assimilative learning processes

6. Bespreekt u de verkregen kennis met uw team? Hoe helpt dit u?

7. Heeft u een gezamenlijke interpretatie van de verkregen kennis?

8. Integreert u de nieuwe kennis in het bedrijf? Slaat u het bijvoorbeeld ergens op? Hoe helpt dit u?

9. Verspreidt u de kennis binnen uw bedrijf? Hoe helpt dit u?

10. Maakt u gebruik van bepaalde tools om kennis te verspreiden? Hoe helpt dit u?

Transformative learning processes

5. Interpreteert u de verkregen kennis bewust?

6. Reactiveert u eerder verkregen kennis? Kunt u een voorbeeld geven?

7. Creëert u nieuwe kennis op basis van verkregen kennis? Kunt u een voorbeeld geven? Faciliteert u dit voor uw werknemers?

8. Linkt u bestaande kennis met nieuwe inzichten? / Combineert u nieuwe kennis met bestaande kennis? Hoe helpt dit u?

Exploitative learning processes

2. Hoe zet u kennis om in commerciële doeleinden? Kunt u een voorbeeld geven?

Combinative capability

Systemization

7. Is uw kennis geformaliseerd? Waarom (niet)?

8. Heeft u routines om kennis te systematiseren? Waarom (niet)?

Coordination

4. Heeft iedereen in het team zijn eigen specifieke taken? Wordt er geroteerd? Waarom/hoe?

5. Wordt er gecommuniceerd tussen verschillende functies? Wordt er met elkaar gedeeld wat er gaande is? Hoe helpt dit uw bedrijf?

6. Wie in uw organisatie neemt deel aan het maken van beslissingen? Hoe helpt dit u?

Socialization

9. Kunt u beschrijven hoe 'intens' sociale relaties zijn binnen uw organisatie? Bijv. Formeel/informeel, close/niet close. Denkt u dat dit invloed heeft op uw bedrijf? En op netwerken?

10. Verschillen uw werknemers van achtergrond? (als in opleiding, cultuur, geslacht etc.) Denkt u dat dit invloed heeft op uw bedrijf? En op netwerken?

Part C

Incubator

Funding

1. Heeft u financiële hulp ontvangen via uw incubator?

2. Denkt u dat u ook zonder deze financiële hulp gekund had?

Coaching

3. Heeft u coaching/training ontvangen via uw incubator?

4. Denkt u dat u zonder deze coaching/training had gekund?

Office space

5. Heeft uw incubator geholpen met het vinden van een werkplek?

6. Denkt u dat u dit ook had kunnen vinden zonder uw incubator?

Common services

7. Heeft u de mogelijkheid om gebruik te maken van gezamelijke faciliteiten?

8. Denkt u dat u deze mogelijkheid ook zonder een incubator had kunnen krijgen?

Organized networking

9. Organiseert uw incubator netwerkmeetings?

10. Denkt u dat u een netwerk zoals die nu is had kunnen hebben zonder incubator?

Legitimacy

- *Regulatory legitimacy: compliance with laws and regulations*

  1. Heeft u een health technology assessment report of iets dergelijks?

- *Normative legitimacy: addressing societal norms and values*

  2. Bent u bewust bezig met maatschappelijk verantwoord ondernemen?

Appendix D - Network mapping

ArtMen	Closeness	Frequency of contact	Duration	Through
Company that is making our CE files	Neutral	Few times a month	1 year	Start-up world
Company that is helping us with our clinical trials	Neutral	Few times a month	2 months	Start-up world

qHeart	Closeness	Frequency of contact	Duration	Through
Family	Very close	Few times a week	Years	Family
Administrative office	Close	Few times a week	Years	Administrative office
Education	Neutral	Few times a month	Years	Post doc/MBA

S-Waves	Closeness	Frequency of contact	Duration	Through
Colleague and investor	Close	Few times a month	9 years	Previous job
Business angel	Very close	Few times a month	9 years	Previous job
Employee	Close	Few times a week	5 years	Daughter

MoBio	Closeness	Frequency	Duration	Through
Incubator	Close	Few times a month	6 years	Co-founder
Investment and advisory agency	Close	Few times a month	3 years	Incubator
Start-up	Very close	Few times a week	4 years	Consultancy job
Governmental investment agency	Neutral	Few times a year	4 years	Own research
Scientist	Close	Few times a year	2 years	Our network
Scientist	Neutral	Few times a year	2 years	Own research
Scientist	Close	Few times a month	4 years	Our network
School	Neutral	Few times a year	1 year	Recommended by another company
Potential investor	Close	Few times a year	8 years	Own network

Surlants	Closeness	Frequency	Duration	Through
University	Close	Few times a month	12 years	Professor from existing network
University	Neutral	Few times a year	7 years	Professor from existing network
Hospital	Close	Few times a year	8 years	Professor from existing network
Investment agency	Neutral	Once a month	11 years	Own network

BioPack	Closeness	Frequency of contact	Duration	Through
Customer	Close	Few times a month	8 years	Former customer
Customer	Close	Once a month	7 years	He contacted me
Account manager of a bank	Close	Few times a year	2 years	We were looking for financing

MicFlu	Closeness	Frequency	Duration	Through
External business developer	Close	Daily	18 months	University network