

New Business Partner Search, Find and Selection In Small High-Tech Companies: An Entrepreneur and Managers' Perspective

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Abstract

Nowadays technologies in high-tech follow each other in rapid succession, these technologies are discovered by entrepreneurs. These entrepreneurs need to collaborate with other companies to stay on top in their field of practice with new innovations and large added values for society when you think of high-tech medical devices for example. However the high-tech market is often a small market and while increased (online) network opportunities exist, it remains difficult for entrepreneurs to search, find and select the right new business partner for their novelties in a sustainable relationship. Therefore the goal of this paper is to study the process of how entrepreneurs of small high-tech companies in the Netherlands search, find and select a new business partner in order to develop a sustainable relationship and successfully innovate. To answer the research question, a literature review and an empirical study were conducted in the form of a qualitative research method. The research method consisted of fifteen semi-structured interviews that took place with people responsible for the search, find and selection process in small high-tech organizations. This is done in order to understand the process and to understand and explain the decisions entrepreneurs make in successful collaborations with new partners. Data shows that opportunity recognition and the partner search, find and selection process are individual processes in which different people are responsible. It also shows that entrepreneurs develop opportunities over time instead of “popping-up”. Furthermore, this research adds to the theory on the partner selection process with two new proposed stages “pre-search” and “project”. It also shows that collaborations in the high-tech sector often occur with larger vertical value chain partners. Additionally, interview data showed that the factors; personal trust, personal commitment, personal bond and time-to-market had an influence on the process. More precisely, they are not only good for a more efficient process and good decisions, but also for the long term. But, these factors also indicate that the process is very dependent on the people involved and their previous experience. However, this research managed to establish a list of recommendations for entrepreneurs and managers of small high-tech companies to give them a guide on how to search for and select a new business partner. Additionally, a suggestion about a new way of searching and finding a new business partner has been made.

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1. Introduction

A lot of small high-tech companies are established by novel entrepreneurs who identify opportunities and seek to expand their business. In starting business, entrepreneurs can choose a go-it-alone strategy. However, collaborations with other businesses and researchers might be needed in order to make a profit, be successful or at least viable. The main reason for this is that small high-tech companies excel in cutting-edge technology, but lack manufacturing capabilities or distribution channels to turn their technology into a successful or profitable business (Vanhaverbeke, Vermeersch & De Zutter, 2012).

In practice however, collaborations show a failure rate of 50% (De Man & Duysters, 2002; Holohan, 1998). The search-, find- and selecting process of a new business partner brings entrepreneurs uncertainty and costs a lot of time and money. A lecturer (S.J.A. Löwik, personal communication, 9 January 2017) at the University of Twente in the Netherlands experienced that entrepreneurs, from both small and large firms operating in different occupational branches, asked for a business partner that could contribute value to the development of their product. In these situations the lecturer functions as a 'bridge' between two companies, where he spent a lot of time to bridge the structural hole¹. On their own entrepreneurs experience difficulties in finding a partner themselves, often they had no idea where to start or what decisions to make. This is a problem because in high-tech industry, ideas, development and commercialization of technology is a long-term road and of vital importance for small high-tech firms. If the development of new technologies takes too long, the firm loses competitive position and thus business success. The high-tech industry is competitive, technologies and innovations follow each other in a short amount of time and product lifecycles are shortened (Vanhaverbeke et al., 2012). Entrepreneurs establish collaborations in all kinds of forms, such as commercial collaboration, joint ventures, mergers and even partnerships with competitors and clients. Such collaborations are not surprising because they give a company the opportunity and access to new resources, expertise and new ideas (Emden, Roger & Cornelia, 2006). In conclusion, collaborations are very important.

Emden, Roger and Droge (2006) showed a clear model of what managers pay attention to when selecting a business partner. However it remains unknown, to which phases the three alignment steps in their paper belong. In addition, it is not clear why and when the managers make decisions and which (individual) factors might play a role. As a result, there is no clear understanding of what, when and why decisions have to be made in this complicated process. This can lead to wrong decisions with regard to searching, finding and selecting a new business partner. It is suggested that collaborations therefore fail sooner causing entrepreneurs losing time and money.

The aim of this research is to understand and explain the phases of the search, finding and selecting process with new business partners and the decisions entrepreneurs make in order to establish a sustainable and successful collaboration. Additionally, it gives recommendations about ways of contacting a new business partner and how to efficiently manage the process, and maintain a sustainable collaboration.

¹ A structural hole exists between two actors when they are connected to the same other actor but are not connected to each other (Zaheer, Gözübüyük & Milanov, 2010)

1.1. Theoretical gap

The process of searching, finding and selecting a business partner starts with the recognition of an innovation, technology or market opportunity by an entrepreneur. Opportunity recognition is a wide studied subject. Studies show a lot of factors that influence opportunity recognition, however these factors are treated separately and are not linked to resulting business collaborations (Ardichvili, Cardozo & Ray, 2003; George et al., 2016; Kirzner, 1997; Casson, 1982; Baron, 2006; Shane, 2003; Shane, Nicolaou, Cherkas & Spector, 2010; Hansen, Shrader & Monllor, 2009; Sarasvathy, 2002). In the developing phase of an idea, entrepreneurs may benefit from collaboration with a business partner. So far, there seems to be a gap in the literature between the opportunity phase and the search, find and select phase to a new business partner. Academic research provides information about business partner selection and collaborations, however the theory about this subject is still growing (Tsou et al., 2015; Lee, Olson & Trim, 2012, Dawson, Young, Tu & Chongyi, 2014; Manick & Midler, 2008). Most study insights are based on individual cases of large manufacturing firms, for example in large multinationals like Siemens, Xerox, Philips and General Electric, due to their large internal R&D departments or because they are active in technology intensive industries. However, the results from these studies are not directly applicable to entrepreneurs of small high-tech firms, because of size, resources and structure constraints (Chesbrough, 2003; Varis, 2005; Van de Vrande, De Jong, Vanhaverbeke & De Rochemont, 2009; Gassmann, Enkel and Chesbrough, 2010). Therefore reason exists to study how collaborations are managed and organized by entrepreneurs in small high-tech firms. In particular the subsequent steps entrepreneurs make in the search, find and select phase to a new business partner. Prior research is mainly focused on the partner selection process based on an already narrowed list of possible partner. However, literature does not mention the important previous steps in how the 'right' possible partners are found. Our aim is to describe how decisions are made by entrepreneurs.

1.2. Insights from an exploratory, practical perspective

To become familiar with searching, finding and selecting new business partners in a high-tech environment, a preliminary interview has been conducted with the Managing Director of the Open Innovation Academy in Eindhoven, Margot Nijkamp-Diesfeldt. She started Packard Bell Europe, Intermec, E-One and Holst center which is the first Open Innovation Institute in the Netherlands. In addition, she set up the OpenSME program for niche market by SME companies.

During the interview, Ms. Nijkamp-Diesfeldt emphasized the importance of collaborations but also mentioned that there has to be a certain need or urgency for small high-tech companies to collaborate. Small high-tech firms are vulnerable to copy behavior or stealing of patents by large multinationals. Despite the open character and presence of patents, sharing knowledge and technology is a risky business for small high-tech firms. So, there must be a strong reason for small high-tech firms to make the decision to collaborate with new external parties. Ms. Nijkamp-Diesveldt further indicated that there should be a 'why' question for the entrepreneurs of small businesses because the entrepreneurs may not need anyone from the outside to develop, produce and commercialize their product. She also indicated that the 'human factor', especially in SMEs, is decisive in collaborations. Furthermore she told that entrepreneurs want to look each other in the eye and get to know each other before they enter into an intensive collaboration process. When this step is skipped in the process people tend to part faster because expectations could not be fulfilled. In short, there must be a high urgency, the collaboration must add value and the personal relationship between two parties is important.

1.3. Scope of the research

The purpose of this research is to provide a list of recommendations for entrepreneurs of small high-tech firms concerning ways to search new business partners, which steps to take in this process, what to look out for and how to maintain a sustainable relationship. The research focuses on searching, finding and selecting phases, because it appears from practice that entrepreneurs experience problems in these phases. They do not know where to search and what decisions to make in order to start and maintain an innovative sustainable relationship with new, unknown business partners. The scope of this research is up to the part where the entrepreneur makes the decision to collaborate. By doing so, this thesis distinguishes itself from prior research because it examines the earlier and subsequent steps in the search, find and selection model in order to provide a better understanding and explanation of the phases and the decisions managers have to take. This will be done by conducting in-depth interviews with entrepreneurs who successfully developed collaborations within their company.

In this study entrepreneurs of small high-tech companies are interviewed. New business partners they are looking for may be larger parties like multinationals. With the rapid changing industry it is likely that high-tech firms use the knowledge and resources of bigger companies in order to access new or larger markets for their products. Globalization also makes it possible for small high-tech firms to collaborate with companies from other countries due to instant communication. However, there is an assumption that in regional collaboration it can be easier to achieve a sustainable relationship due to similarities in geographical location and company culture. Therefore geographic location and culture seem to be very important in sustaining a good relationship.

1.4. Research question and sub research questions

How do entrepreneurs of small high-tech firms search, find and select a new business partner in order to develop a sustainable relationship and successfully innovate?

Sub research questions

1. How do entrepreneurs of small high-tech companies recognize opportunities?

Entrepreneurs have characteristics that enable them to recognize opportunities. In addition, it is unknown if the characteristics and the properties of the developed technology or innovation influence the search, find and select phase and the eventual decision to collaborate.

2. Why would entrepreneurs of small high-tech companies search for a new business partner?

Prior research suggests that collaborations are important. However, in the high-tech industry there is a challenge on this subject, because entrepreneurs can choose to do everything themselves. Why would they run the risk of exposing their idea to external new parties in collaboration, while they could develop their ideas themselves.

3. Why do entrepreneurs of small high-tech companies choose a particular way of seeking and finding a new business partner?

Which ways of searching do entrepreneurs prefer? With this question a possible link between the collected theory and data from practice is studied to make practical recommendations.

4. How do entrepreneurs go through the subsequent steps of new business partner search, find and select?

What are the subsequent steps in the search phase, what do entrepreneurs pay attention to, when do they make decisions and where are decisions based on? With this information possible similarities in the search, find and select phases among the interviewees can be found, in order to contribute to existing literature and to make recommendations for decision making in the model phases.

5. Which factors are important for high-tech entrepreneurs in the decision making of collaborating with a new business partner?

The assumption is that individual characteristics of the entrepreneurs play a role in the process of decision making. With this question the factors that play a role in the decision making are explored as well the phases they contribute to. To what extent is it possible to predict successful collaborations?

6. How do entrepreneurs maintain a successful, sustainable relationship in a collaboration?

In order to give correct recommendations for the search, find and select process, it is critical to know whether collaborations were successful among interviewees. However the scope of this research is up to the part where the entrepreneur makes the decision to collaborate (end of the select phase), knowledge of the further progress of decisions is needed to determine which recommendations are appropriate.

In the next chapter a theoretical background is given about opportunity recognition of technologies and innovations by entrepreneurs and search, find and select of a new business partner. With the theoretical background in mind, a research model will be derived which will be tested by using an empirical study. The next chapter is the method section, it discusses what methods are used in order to address the research objectives of the dissertation. After that the empirical research findings from interview with entrepreneurs of small high-tech companies will be presented and discussed. The last chapter argues both practical and theoretical contributions of the study from which recommendations for entrepreneurs of small high-tech companies will be derived concerning ways of searching, finding and selecting new business partners. Finally, limitations of the study will be described and suggestions for future research will be made.

2. Theoretical background

This chapter will contain the theoretical framework. The concepts and foundations of opportunity recognition and partner selection will be discussed. Furthermore, the factors influencing opportunity recognition are identified and it is examined whether these factors are related to the partner search, find and selection process. At the end of this chapter a research model based on the literature review will be presented.

2.1. Definitions, innovation, business partner, collaboration and small high-tech firms

Baregheh, Rowley and Sambrook (2009, p. 1334) defined innovation as follows: *“Innovation is the multi-stage process whereby organizations transform ideas into new/improved products, services or processes, in order to advance, compete and differentiate themselves successfully in their marketplace.”* In practice the focus is mostly on the ways in which ideas are transformed into new, improved or changed products or services. In order to develop a high-end product companies can benefit from collaboration, this is called co-innovation. Co-innovation is an iterative process that brings knowledge from many stakeholders together to support changes in technology, markets, regulations and other practices. In order to support the commercialization and implementation of the knowledge to improve production, exports, profits and/or the environment (Klerkx, Aarts & Leeuwis, 2010; Garb & Friedlander, 2014).

There exist lots of collaboration forms, like alliances, mergers and partnerships. Most important is that these terms may imply specific legal agreements that bind the involved companies. In this research a broad definition of collaboration is used, this includes: *“any activity where two or more partners contribute differential resources and know – how to agreed complementary aims”* (Dodgson in Leenders & Gabbay, 2013, p.358). When speaking of an alliance the following definition is used: *“any voluntarily initiated cooperative agreement between firms that involve exchange, sharing, or co-development, and it can include contributions by partners of various resources”* (Gulati in Ingirige & Sexton, 2006, p.521)

There are a lot of definitions concerning small high-tech. De Jong & Freel (2010) defined small high-tech firms as follows (1) firms that had no more than 100 employees; (2) were actively engaged in R&D; and (3) had developed new technology-based products in the past 3 years (Grintstein and Goldman, 2006). Further, these companies have an urge to protect their technology by making extensive use of Non-Disclosure Agreements (NDAs), patents and Intellectual Property (IP). The high-tech firms are traditionally found in specific industries, for example; manufacturers of chemicals, rubbers and plastic products, manufacturers of machines and equipment, technical wholesale traders, IT and telecom, manufacturers of aircrafts and spacecraft's, pharmaceutical industry, engineering and commercial R&D firms (OECD, 2011). In this paper, the definition of OECD is used to define high-tech and the definition of the European Commission (European Commission, 2018) to define the size of the company (<50 employees). In addition, the high-tech definition will be further substantiated with the criteria of Grintstein and Goldman (2006).

The term entrepreneur has a large number of definitions. In this paper the focus is on entrepreneurs of small high-tech firms, they can easily be confused with small business owners and managers, but the definitions are holding differences. According to Carland, Hoy, Boulton & Carland (1984, p.358) a small business owner or manager is *“an individual who establishes and manages a business for the principal purpose of furthering personal goals. The business must be the primary source of income*

and will consume the majority of one's time and resources. The owner perceives the business as an extension of his or her personality, intricately bound with family needs and desires". An entrepreneur is defined as "an individual who establishes and manages a business for the principal purposes of profit and growth. The entrepreneur is characterized principally by innovative behavior and will employ strategic management practices in the business". According to Schumpeter (1934) the entrepreneur is considered to be an innovator who disturbs the economic equilibrium during times of uncertainty, change and technological upheaval. It is a person who continuously does things that have not been done before and does not fit established societal patterns. Moreover, an entrepreneur is an individual who is an "instrumental to the conception of the idea of an enterprise and its implementation" (Kets de Vries, 1996, p. 856).

Studies find it hard to give clear definitions of both entrepreneurs and small business owners and managers but some managed to find some differences; Kecharanata & Baker (1999) found that value orientation of entrepreneurs is significantly different from professional managers, Busenitz (1999) found that entrepreneurs use biases and heuristics more than managers in their decision making, which according to the paper results in less risk in particular situations. Stimpson, Narayanan and Shanthakumar (1993) showed differences in business attitudes, with entrepreneurs scoring higher on innovation achievement and personal control compared to managers.

2.2. Perspective and background of opportunity recognition

Opportunity is a popular word in the entrepreneurial literature, a number of esteemed scientists concerned themselves with special attention on groundbreaking articles about entrepreneurship and opportunity recognition (Kirzner, 1997; Venkataraman, 1997; Shane and Venkataraman, 2000). The many studies conducted resulted in a variety of perspectives, this has led to different yet incomplete definitions.

Schumpeter and Kirzner had different perspectives on opportunity recognition. However both perspectives are seen as central principles in entrepreneurial opportunities. Schumpeter (1934) viewed opportunities as new resource combinations. In his theory opportunities could not only be applied to products and services but also to new production methods, new ways to organize markets and ways of discovering new materials. In contrast to Schumpeter, Kirzner (1997) viewed that neither market demand nor resources are in their final phase, but have to be invented. Additionally, Kirzner says that the greatest possibility to create economic returns from opportunities lies at the top of market imperfections, where entrepreneurs can benefit from the disequilibrium (Holcombe, 2003; Cohen & Win, 2007). Academics also have the perspectives that information is essential in opportunity recognition and in identifying opportunities for profitable new businesses (Ozgen & Baron, 2007; Shane, 2000, 2003; Ardichvili, Cardozo & Ray, 2003).

2.3. Conceptualization of opportunity recognition

In the literature there exist different definitions that describe entrepreneurial opportunity. One of the most cited and famous understandings comes from Casson (1982), later Shane and Venkataraman (2000) used this definition and modified it in their study. Shane and Venkataraman (2000, p. 220) defined the entrepreneurial opportunity as such "*are those situations in which new goods, services, raw materials, and organizing methods can be introduced and sold at greater than their costs of production*". Later in 2003 Shane (2003) defined an entrepreneurial opportunity as '*a situation in*

which a person can create a new means-ends framework² for recombining resources that the entrepreneur believes will yield a profit' (p.18). Baron (2006, p. 107) formulated the definition as follows "perceived means of generating economic value (i.e., profit) that previously has not been exploited and is not currently being exploited by others". Sarasvathy (2002) builds on the work of Venkataraman (1997), and uses the definition "a set of ideas, beliefs and actions that enable the creation of future goods and services in the absence of current markets for them" (Sarasvathy, 2002, p. 142). In this paper the definition of Sarasvathy (2002) is used, because it is likely that entrepreneurs have natural abilities to recognize opportunities. Especially in high-tech the expectation is that entrepreneurs believe in their idea and idea development without the presence of a market. So, this definition seems to fit best in this research.

2.4. Entrepreneurs recognizing opportunities

A lot has been written about entrepreneurs and how they recognize opportunities, but there seems to be no clear picture. The literature indicates various factors that influence opportunity recognition. The most frequently mentioned factors are discussed further below.

2.4.1. Factors influencing opportunities

The first of five factors to discuss is prior knowledge. Prior knowledge makes it possible for people to discover opportunities where others do not, because of prior information and the ability to make a value of it (Shane & Venkataraman, 2000; Audretsch, 2005). In addition, people who lack prior knowledge are likely to encounter serious difficulties in the entrepreneurial opportunity process (Kourilsky & Walstad, 1998).

Prior knowledge can help people to recognize patterns when they are confronted with information. According to Baron (2006) social capital in the form of networks can provide possibilities to the entrepreneurs. It is a general note that entrepreneurs need information and probably resources, these can be obtained through networks (Shane & Venkataraman, 2000; Baron, 2006; Ardichvili et al., 2003). Zaheer (2010) showed that networks have weak ties and strong ties. The quality of the ties will predict the quality, quantity and speed of the information that can be gathered. Whereas strong ties are people from stable, social and long-term relationships (George, Parida, Lahti & Wincent, 2016), weak ties are people where entrepreneurs get more information when they interact. Weak ties *are people with whom there are no strong business or social ties. These people include old school or college colleagues, business associates, sporting companions, or any other acquaintances. In the context of opportunity formation, it may also include friends, if these relationships are not characterized by frequent contact in the business context* (De Koning, 1999 p. 7). In addition Zaheer (2010) noted that the higher the amount of strong ties the more resources and strategic opportunities someone can get.

The next factor mentioned in the literature is the personal traits of an entrepreneur. The most mentioned traits are self-efficacy, risk taking, need for achievement, need for independence, creativity, open-mindedness, imagination, curiosity and locus of control (Ardichvili et al., 2003; Garg, Matshediso & Garg, 2011; Baron 2006; Shane, Nicolaou, Cherkas & Spector, 2010). Personal traits together with the already mentioned prior knowledge, environmental changes and social capital are important to recognize, identify and develop opportunities. Scholars found that creativity and the ability to view every situation from a positive perspective is higher with entrepreneurs compared to

² Means-end theory contends that people are continuously making choices in a specific situation that follows certain structured steps, when people understand the essence of those steps and how they are related to each other it is possible to get to know why people are motivated to act in a certain way.

non-entrepreneurs (Baron, 2006, George et al., 2016; Ardichvili, 2003). This creativity can lead to opportunities non-entrepreneurs cannot observe. The positive approach allows entrepreneurs to look beyond risks. They show less fear of failure and they are not surprised by success. According to Li (2011) this ensures that entrepreneurs see new ventures as opportunities. Furthermore, the self-efficacy makes that entrepreneurs set higher goals and achieve them too.

A large part of the early literature on the recognition of opportunities assumed that recognition of opportunities is preceded by a systematic search for available opportunities. Systematic search helps individuals discover opportunities by actively searching for them. Fiet, Piskounov & Patel (2005) note that, discovering opportunities can occur when an entrepreneur has the ability to possess private information and knows how to get specific information that suits the already existing prior knowledge. Other researchers who have investigated this search approach argue that some people recognize the value of new information that they receive by accident, due to alertness (Koller, 1988). A high level of entrepreneurial alertness enables an entrepreneur to identify opportunities without actively searching for it. According to George et al., (2016, p. 336) *“alertness is the capacity to possess keen insights into identifying entrepreneurial opportunities.”* Different scholars involve this factor in their research (Shane & Venkataraman, 2000; Ardichvili et al., 2003; Kirzner, 1973). The literature reported that most entrepreneurs possess high levels of alertness instead of systemic search in order to recognize opportunities for their company. Teach, Schwartz and Tarpley (1989) found that companies that were based on business ideas discovered by alertness instead of a more formal screening process (systematic search) achieved a faster break-even turnover than colleagues who had undergone a systematic search. Therefore, it seems like these two factors, alertness and search, might have a different influence on the business partner search, find and selection process.

2.5. Partner selection criteria for co-innovation

Partner selection decision processes are complex and often comprise a lot of criteria. Different scholars developed a broad range of models and requirements. These requirements are often based on reliability, honesty, quality and fit (Kannan and Tan, 2002). Kannan and Tan more focused on the criteria commitment, honesty, fit, needs and capability in their partner selection method. However, the more criteria mentioned, the more complicated the partner selection processes becomes. Besides, the various criteria are often divided into different phases in the model of partner selection. The emergent model from Emden, Roger and Cornelia (2006) contains three broad phases that pinpoint the processes people follow and the requirements they set in order to select business partners. These phases are discussed below.

2.5.1. Phases of partner selection

Little is known about the steps and decisions that entrepreneurs make in the business partner selection process towards a successful cooperation. The paper of Emden et al. (2006) provides clear phases, but they do not make a distinction in mainly the searching and finding phase. The paper talks about a selection process and seems to assume that the best potential partners are already been found, which means that the alignment phases that are mentioned are attributable to the find and select phases. That is why this section starts with literature about searching, followed by the alignment phases of Emden et al. (2006).

There is no literature on why entrepreneurs of small high-tech firms should search for a collaboration with a new business partner in advance. However, the search process according to Dekker and Van den Abbeele (2010) is an important organizational learning process that provides valuable partner information. Even more significantly, it is considered as a critical element in the management of

(inter)firm relationships and it can affect all subsequent phases (Ireland, Hitt & Vaidyanath, 2002). The partner search process differs from learning experiences in a way that it arises from circumstances, such as; emerging control problems, opportunism by the exchange partner and coordination of complex tasks that induce proactive information search. So the process can be considered as “deliberate learning” (Huber, 1991; Zollo & Winter, 2002; Gulati and Singh, 1998). Search can facilitate the identification of potential partners with valuable or complementary resources and knowledge. It can also soften control problems concerning transactions and the acquisition of information that might affect the subsequent phases of partner selection (Dekker, 2008). People who spend more time and effort on searching for a business partner affect the type of partner they choose considering capability and reliability. Through partner search firms may get critical information regarding the potential business partner, alternative partners and their products (Dekker, 2008).

According to Emden et al. (2006) entrepreneurs first focus at technological alignment. This phase attracts the attention of other entrepreneurs and can give reason to collaborate. In addition, Lusch, Vargo and O’Brien (2007) and Subramani and Venkataraman (2003) say that business partners with technological knowledge (i.e. expertise) will be more willing to engage in a collaboration. In this phase it is also important to convince the business partner of ones capabilities, certainly if partners are not sufficient informed about the technological competences of one another.

Technical resource and market complementarity is the second sub-category among technological alignment. Emden et al., (2006, p. 335) states “*partners would be able to exploit or create opportunities only by integrating their complementary skills and resources*”. By starting a collaboration, businesses have the ability to develop and create new market segments for their mutual product. Additionally, Hill and Hellriegel (1994) and Luo (1997) concluded that complementary assets of partners are making it more obvious for a collaboration to succeed. According to Glaister (1996) significant innovations often arise out of complementary skills.

The last sub-category of technological alignment is about overlapping knowledge of business partners. Emden et al. (2006) found that managers who partly have the same knowledge base allows them to recognize possible value in potential business partners competences. In addition the overlapping knowledge provided three important matters (1) realize technology potential; (2) discovering of complementarities of both partners competences; and (3) communicate these in the organizations (Emden et al., 2006).

Strategic alignment is divided into two sub-categories (1) motivation correspondence and (2) goal correspondence. The motivation correspondence means, according to Smith, Brock and Barclay (1997), the extent to which the perceived ulterior motives of business partners are in line with each other. In the study of Emden et al. (2006) it turned out that a variety of businesses had partners with very different but correspondent motivations to start a collaboration.

The last remaining emergent phase contains relations alignment. This phase is divided into three sub-categories, namely (1) compatible cultures; (2) propensity to change; and (3) long-term orientation. Compatible cultures is an enumeration of understandings, these are cognition, expectations, mindsets, norms and values in an organization (O’Reilly, Chatman & Caldwell, 1991). Additionally, it describes the behaviors in an organization and it shows how decisions are made within an organization. Emden et al. (2006, p. 337) state “*To have effective communication and exchange of knowledge, there has to be at least a minimum congruence in norms and procedures, that is, in the way of doing things. Partners should be able to speak the same language*”. It is obvious that business partners who

understand each other and have almost equivalent cultures are more likely to work towards a shared purpose. They also found that in some cases, where the culture differentiated a lot and would never match in the forthcoming period, openness and consistency from all involved could still provide a common ground for a fruitful collaboration. When businesses have the intention to work together the willingness to adapt is very important, certainly when the requirements of a collaboration change (Emden et al., 2006).

The final sub-category of phase three is a long term orientation. Business partners who focus on long-term relationships are preferred over other businesses, the reason; it gives a business partner the possibility to resolve problems and conflicts and it provides often a solid basis in times of uncertainty (Emden et al., 2006). Ganesan (1994) noticed that a long-term orientation pinpoints both current and future outcomes whereas short-term focus is exclusively focused on options and outcomes of the current period. In Figure 1 the emergent theory of partner selection is showed. It contains a framework that pinpoints the selection process for a business partner.

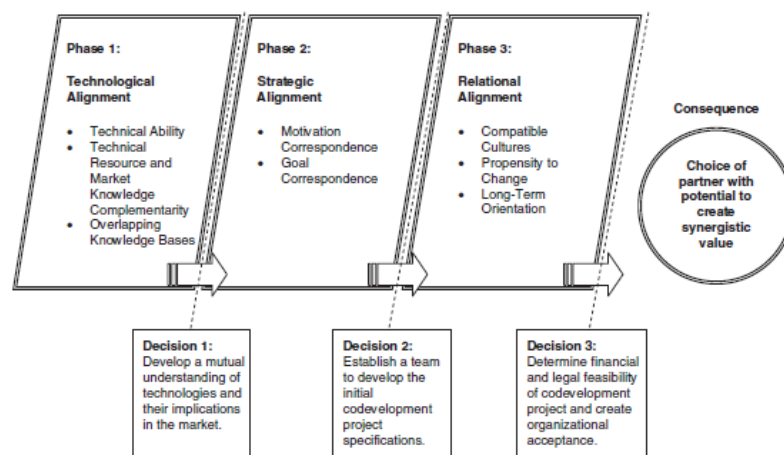


Figure 1. Emergent theory of partner selection for creating new products through collaboration (Emden et al., 2006)

2.6. Wat is a successful, sustainable collaboration?

One of the most difficult understandings in literature is success. In practice success is often viewed in terms of meeting the objectives that were set for the collaboration, it is mostly about whether products were developed as planned, within a certain time and budget. Dodgson (1993, p.151) confirmed the problems with measuring success: *"The range of firms' circumstances and their expectations and experiences of collaboration are so variable as to make uniform definitions of success and failure unwise"*. Other scholars shared this problem, Brockhoff and Teichert (1995, p.111) state *"Success is a concept with a multitude of facets, which makes it difficult to develop a measurement approach"*. In evaluating a collaborative success one may find technical success in combination with economic failure (Carvalho, 2002). Even when the goals and objectives set for the collaboration were achieved, some business partners may not be satisfied with the quantitative results but there might be an 'indirect' benefit from the collaboration. For instance, the acquired knowledge can be applied in other products and areas, therefore success is multifaceted. Since success is multifaceted the entrepreneurs opinion about whether a collaboration was successful or not is also needed, like Doz (1988, p.325) mentioned: *"Partnerships are going to be viable only insofar as the value of the joint results to both partners is superior to the opportunity cost they incur - in particular, the cost of the loss of control and autonomy that follows the partnership."* In addition Saxton (1997) also used the opinion of the entrepreneur as a way of better understanding the contribution of certain factors in explaining success and duration.

Finally another, rather vague, understanding is the term sustainable or long term collaboration. Barlow (1997) and Horton (1998) expressed short term and long term in terms of one-off projects and several projects. However, certain collaborations need longer relationships in order to reach their goals. According to Niosi (1996, p.99) the strategic importance of a collaboration and their consequences for the partners are not positively correlated with the length of time. Further, he stated that a collaboration could be called a long-term relationship when the duration was six months or more. In addition, the research indicates that the negotiation phase on itself can last for six months, which means that entrepreneurs know each other for quite a while before they sign the contract. In short, success is variable and interpreted differently by all people involved. It is also difficult to measure success due to qualitative goals such as acquired knowledge. Therefore the opinion of the entrepreneur in this research is important to establish whether a collaboration has been a successful or not. Moreover, it is perhaps better to measure a sustainable relationship with the various projects that have been started together.

2.7. Conceptual framework

In the paper of Emden et al. (2006) the conceptual model is not completely clear. First, it is not clear whether the model concerns new business partners. Second, it is not exactly clear how the process works and where one should start searching. The paper describes which elements managers pay attention to, but not what they do with the information and how they go to the next phase. This creates ambiguity and entrepreneurs do not know which decisions to make and how to work efficiently towards a sustainable relationship, all together resulting in lost time and money. That is why, based on the research question and the aforementioned literature, the following conceptual model is proposed. It is considerably based on the Emergent theory of partner selection from Emden et al. (2006). The new conceptual model that is created suggests factors of opportunity recognition as discussed in the theory section; search and alertness (independent variables) together with the alignment phases (10) of Emden et al. (independent factor) influence the search (1), find (2) and selection (3) process (dependent variables) and thus the decision to collaborate (7) in a sustainable relationship (9). Where and how these factors influence the process will have to become clear through this research, just like the determination of success (6). It is important to understand when these factors influence the search, find and select process to make practical recommendations to entrepreneurs from small high-tech companies in order to efficiently search, find and select, to save money and time.

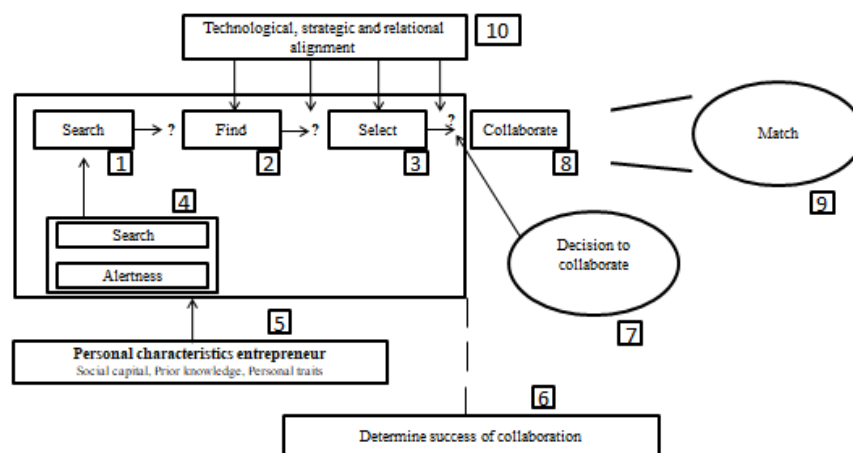


Figure 2. Conceptual framework from the researcher based on literature

3. Methodology

The purpose of this research is to investigate how entrepreneurs of small high-tech companies search, find and select a new business partner in order to develop a sustainable relationship and successfully innovate. In addition, a list of recommendations about ways of efficiently making contact with new business partners is provided in order to achieve a sustainable, innovative collaboration.

3.1. Qualitative method

In this study a qualitative research method is used in order to understand and explain the phases entrepreneurs go through and decision that have to be made in the search for a new business partner. (Eisenhardt, 1989; Myers, 2009). The use of case studies allows researchers to study the process in a natural setting and understanding the phenomena rather than measure it (Bryman & Bell, 2011). Eisenhardt (1989, p. 542) further noted that in-depth case research encourages theory building by allowing the constructs, their definitions or measurements, and relationships among constructs to emerge from the process rather than being specified at forehand. Nevertheless, the research problem was formulated and the existing literatures were reviewed to identify potentially important constructs. Additionally, large benefits of a qualitative research approach are gathering data from inside, that is, the field of practice. This method is characterized by its open view, which is focused on understanding the situation. The holistic view allows to get "meaningful" findings" (Miles & Huberman, 1994). Interviewing is one of the most widely used methods of qualitative research (Bryman and Bell, 2011). Qualitative interviewing is less structured compared to the structured approach where the researcher has a specified set of questions to be asked in a fixed order. In this study a semi-structured interview method was used, whereby the interviewer was able to use a more flexible approach in the questions asked following the main question. This method seemed best suited to maintain an open mind during the collecting of empirical data in the study. Moreover, other relevant sources like; articles and websites were used to gather information about the collaborations, representatives involved and company information. The unit of analysis in this study is the individual entrepreneur or manager responsible for the new business partner search, find and select.

3.2. Sample

Concerning sampling and sample size of qualitative research, enough is the amount where additional participants don't provide any additional insights, also referred to as "saturation". Saturation is reached when the researcher is no longer learning very much from each subsequent interview (Guest, Bunce & Johnson, 2006). They also notice that saturation usually take place at 12 participants. To ensure saturation is reached and no new major concepts emerged 15 interviews with entrepreneurs and managers, that is, those people responsible for the search, find and selection process were conducted. The target audience in this study consists of entrepreneurs and other representatives of small high-tech companies, who were responsible for the search, find and selection process in sustainable and successful relationships with new business partners. They participated in the interviews in order to get a deep insight in the process and valuable opinions and experiences. Their input was of great value for mapping the search, find and selection process with new business partners and giving recommendations on how to make contact with new business partners and setting up and maintaining sustainable relationships with new parties in a high-tech environment.

All the companies had less than 50 employees, were active in a high-tech industry with high-tech products and invented new innovations the past three years during a sustainable collaboration. The participants were all men aged 28 to 68 years, they all held positions as entrepreneur or manager (CEO, CDO, CTO, Sales & Marketing). In addition, the companies were all located in the Twente area. Some participants also ran several other (high-tech) companies in the Netherlands. The

interviews were held in the Dutch language because that is the mother tongue of the participants. Furthermore, the duration of the studied collaborations were measured from the start of the first joint project. Interestingly, all the collaborations consisted out of vertical value chain partners in technical development collaborations. In addition, there is some difference in the year of establishment between the companies (1982 - 2015). In the chapter findings we want to elaborate on the characteristics of the participants, as they are interesting for the research.

Participant information			Business description, high-tech sector	Founding year	Participant invented the innovation	Duration collaboration (measure of: 1st project or contract)	Amount of employees
	age	Position in the firm					
Anonymous1	48	CEO	Sustainability, reducing noise	2012	No	4 years	4
Anonymous2	68	CEO/owner	IT, Inspection systems and applications	1982	Yes	11 years	11
Anonymous3	36	Sales and Marketing Manager	Nano technology	1991	No	3 years	30
Anonymous4	46	CEO/owner	IT software medical devices	2014	Yes	4 years	5
Anonymous5	63	CEO	Developer Medical instruments	2005	No	4 years	10
Anonymous6	28	CDO	Robotics	2012	No	4,5 years	20
Anonymous7	49	CEO/Co-owner	sustainability, space and process cooling	2014	No	4 years	6
Anonymous8	37	CEO/owner	Micro and nano technology medical industrie	2011	Yes	6 years	8
Anonymous9	47	CEO	IT, electronics and software	1994	No	3 years	45
Anonymous10	31	CEO/Co-owner	IT software	2014	Yes, partially	4 years	8
Anonymous11	32	CEO/owner	Micro and nano technology medical industrie	2015	Yes	3 years	10
Anonymous12	40	CEO/Co-owner	Micro technology ultrashort pulse laser	2008	Yes, partially	3 years	6
Anonymous13	47	CEO/Co-owner	Chemicals solutions industry related	1974	No	8 years	38
Anonymous14	36	CEO/Co-owner	IT software	2005	No	4,5 years	40
Anonymous15	42	Strategic Purchaser	IT software, energy sector	1983	No	6 years	35

Figure 3. Firm and participant information sample

3.3. Measurement instrument

In order to conduct the semi-structured interviews, an interview protocol was set up (appendix 1). This interview protocol served as a guideline and helped to cover the scope of the research. Furthermore, Flick (2015) noted that interviewees are expected to reply as freely and extensively as they wish. It was very difficult to find suitable participants and it was difficult to schedule meetings through full planned agendas and other obligations. Ten face-to-face meetings were scheduled and five phone calls were conducted, each interview lasted from an hour to an hour and three quarters depending on the time the participant had and the questions that were answered. With the exception of one interview, all interviews were recorded by telephone. In addition, notes were made by the researcher immediately after and during the interviews. Due to agreements between collaborating companies the names of the involved participants and small high-tech companies had to be processed anonymously. After the interviews the audio tapes were transcribed into text files and analyzed with the help of advanced qualitative software for large bodies of text, audio and video data, Atlas.ti (version 8). This was done to make interview results more organized and as a result a list of empirically discovered quotes from participants could be linked to some aforementioned constructs.

3.4. Reliability and validity

One characteristic of qualitative research is that the findings in the field reflect reality at one point in time, because of the complexity and dynamics of the situation, data is hard to replicate (Saunders, Lewis & Thomhill, 2009). However, conducting semi-structured interviews may lessen reliability,

cause and effect cannot be measured, it will probably involve some bias since it is not possible to guarantee the honesty of the interviewee, errors such as data processing error, sampling error, data collection error can occur and it is harder to compare answers (Bryman and Bell, 2011). To cover these drawbacks as much as possible, short after and during the interviews, notes were made in order to enable other people to understand the findings when necessary and to have a back-up when audio recordings would have failed (Robson, 2002). To further care for reliability and validity a variety of competences were applied to decrease interviewer bias for instance. Healey and Rawlinson (1994) argued that an assurance about anonymity should make interviewees more relaxed and open about the information that they are willing to discuss, this should increase the level of confidence in trustworthiness and reduce the possibility of interviewee or response bias. A more friendly atmosphere was created at the beginning of the interviews, to increase credibility, trust and to promote a smooth and easy conversation. Additionally the researcher showed commitment to confidentiality by not naming other organizations that have participated in the research, or by talking about the data obtained from them. Further the open questions were phrased clearly so the interviewee could understand them and questions were asked in a neutral tone of voice (Healey & Rawlinson, 1994; Easterby-Smith, Thorpe & Jackson, 2008). Further, theoretical concepts and jargon were avoided as much as possible since terms may vary from that of the participants (Ghauri & Grønhaug, 2005). Further, behavior of the researcher reduced the bias due to the avoidance of comments, beliefs and non-verbal behavior, such as gestures indicating bias in thinking for example. The researcher had an open posture, which indicated attentiveness to the interviewee (Torrington, 1991) and also the appearance of the interviewer was appropriate.

Five interviews were conducted through phone calls. This might have influenced the results because phone calls reduce the non-verbal communications of the participants. This could lead to misunderstandings in interpretations and decreased trust between the researcher and interviewee because they could not see each other. To avoid misunderstandings and misinterpretations, the phone calls were audio recorded

The participants involved in this research were all men, in the age of 28 to 68. They were all involved in sustainable collaborations with new business partners lasting from three to eleven years, measured from the first signed contract or the first joint project.

3.5. Data analysis

Like mentioned earlier in this study, the data from the interviews was transcribed and organised by coding the data, the next step was analysing and finally conclusions were made with the help of quotes from the data. For coding and organizing the data, Atlas.ti was used, an advanced qualitative research software tool. Analysing concerns coding, patterning, categorizing and reasoning which obviously are also part of data analysis. The coding process is based on the structure of Strauss and Corbin (1990), they used a structure with three phases; open, axial and selective coding.

Organising typically starts with 'open' coding in which the data is examined line-by-line and given a code consisting word or short phrase, regarding axial coding, to similar units of data the same codes were attributed and organised in sub categories. In the last phase codes were merged (Corbin & Strauss, 2015). Also the in vivo method of assigning codes using the respondents' own words and languages is used and add more analytical depth (Strauss, 1987). In short the codes are generated by terms emerged from the data, respondents and theory and literature. A list of codes can be found in Appendix 2.

Further, the data was analysed with the help of the conceptual model. This model was formed thorough a literature study and helped to organise the data. Furthermore a deductive approach is used; the analysis started with summarizing the main findings of the interviews and categorizing and coding the data using Atlas. Additionally, relationships, main themes and patterns were identified to eventually draw conclusions.

4. Results

This chapter outlines the results from the conducted interviews. The findings are substantiated with quotations to strengthen the interpretations. Paragraph 4.1. concerns information about the participants, 4.2. describes the phases entrepreneurs go through and the decisions they make and 4.3. concerns the factors making the process more efficient.

4.1. About the participants

During the interviews it became clear that **founders of small high-tech companies do not always have the CEO positions** (9 of the 15 cases). Entrepreneurs are not always seen as capable of actually leading the founded company, instead investors appoint managers who will lead the companies. That is why in this research entrepreneurs and managers were both interviewed. Anonymous1 said: *“I have been asked by investors to leave my job as director of (.....) behind me to get started as CEO of (.....). My position is CEO but I am an entrepreneur or at least entrepreneurial”*. Interesting was that some managers such as anonymous1 have had their own business in the past. Anonymous 3 gave another view on the challenges a small high-tech company. His answer probably reflected the characteristics of an entrepreneur, the establisher of the company, and the innovation best: *“Ideas are often conceived from a technical point of view, innovation often comes from a technical angle, then something is tried and investments are needed. At the time that investments are made, people want return on investment and that is often not so fun and exciting for technical people”*. Anonymous 10 emphasize the importance of capital: *“at a given moment you need money for product developments and expanding of the organization and luckily we got that too, early phase loans and someone who stepped in early.”* Anonymous 7 noted that investors looked at the extent to which the entrepreneur and the existing team could provide a return: *“We needed investments in the early beginning of our company to further develop our product and to grow. Investors look at the people who are running the business and required that I work five days a week for the firm instead of three.”* The team must be able to take care of problematic situations, to minimize the loss of investors’ money.

4.1.1. Need to search new business partners

The interviews show that there are substantiated reasons why entrepreneurs and managers of small high-tech companies search for new business partners outside their own trusted network (1st degree contacts). The most mentioned reasons were a **lack of resources** (12 cases), **lack of knowledge** (11 cases) and **lack of capital** (6 cases). All participants were active in business-to-business (B2B) collaborations because their innovation was not yet ready to enter the market as a useable product. Anonymous10 gave the following example: *“During our study we realized that we had to work together, so there was a need to collaborate actually. Our product itself has little value until you integrate it. We are a like Word or Excel program that also has value for a customer but has to run on a certain operating system such as Windows”*. They need another company with specific resources to make their product of value. Going alone is not an option as Anonymous6 argued: *“We started a completely new product. We did not have the knowledge ourselves, nor the numbers and especially not the consistency of the quality of the 3D printing. That is unknown territory for us. We have also been thinking of buying a 3D printer ourselves, but then you are stuck with major investments but also with ignorance in our own company, it is not our core business. Moreover, if he does not print, he would have to print for others in order to get a return, the result is that you move away from your core business. You should not have that either”*. The specific knowledge, resources and (market)experience a third party has, can contribute to the willingness of an entrepreneur or manager from a small high-tech company to search outside their 1st degree contacts. Even experienced managers with large networks can benefit from searching outside their networks because their knowledge is very specific and dependent on the high-tech sector. For example, anonymous5, who switched from a job as senior

manager in the pharma industry to a small medical high-tech company. He had to rebuild his network contacts because his accumulated contacts could not help in the new sector. Additionally, 9 of the cases mentioned that, even if potential business partners are in the contact list of an entrepreneur or manager, it does not automatically mean this potential business partner is chosen. Anonymous15: *"You do not enter into a partnership on the basis of knowing someone, because then a certain laziness creeps in. You trust each other anyway, but you will miss that step you want to make. Fine if it is true, that you enter into a partnership with a known contact or friend. But I like to see it first myself. Companies with five man production staff and three office workers do not bring us any further"*. It looks like all of the business partners, in the investigated cases, are larger than the founders companies. Also they are part of a vertical value chain, after all, the innovation is not ready for use yet. Therefore resource dependence and operating in a niche market seems to be the dominant reason for entrepreneurs and managers of small high-tech firms to start searching a new business partner. All studied cases show that, although the small high-tech entrepreneurs could make products in a go-it-alone strategy, they lack the specific knowledge, capital and quality to develop the whole product by themselves and as a consequence they lose time to market.

4.1.2. Characteristics of entrepreneurs and managers

Characteristics in business partner search

Findings show that participants responsible for business partner search in this research, had some important characteristics. They **communicated easily** (12 cases), had a **large network of business contacts** (8 cases) and were **not afraid to leave their comfort zone** (12 cases). Anonymous11 noticed: *"You see a lot of the world; you speak at congresses and are forced to step out of your comfort zone"*. This happened during the early research and PHD phase of this participant. During exhibitions and conferences participants attempt to make people enthusiastic for their product (9 cases). This is an important requirement for finding or attracting new partners and arousing the interest of the end user. Anonymous6: *"Our CEO has a background in aerodynamics but is also very good in sales, enthusiasm people in our innovation and the operation of such a product. Important requirements for the commercialization of our innovation"*. Anonymous14 said: *"Then I contacted him via e-mail and said; you do not know me and I do not know you, but I am affiliated with a small software company. That is not my background at all but I have the ambition to be a leading software company in the Netherlands that is why it is better for you to join me now"*. This manager was looking for a business partner shortly after he started his new job. This somewhat bluffing statement awakened the interest of the owner of a large and renowned company.

Broad knowledge and experience

Additionally, 11 of the cases show that for the business partner search process participants **do not need sophisticated technological knowledge**, as different participants stated: *"I do not have to know, at a molecular level how chemistry works. I especially need to know what we can achieve with our chemistry in terms of properties"* (anonymous13), *"I have a technical background, but this was abracadabra for me and I do not need to know the precise technique"* (Anonymous3), *"someone who does everything around it, a kind of handyman. That is me"* (Anonymous7). In addition, the interviews showed that **managers had an important advantage over entrepreneurs**. Because of their **knowledge of (large) organizations, organizational structures and their individual work experience** (8 cases). Like Anonymous5 who gained experience in large pharmaceuticals multinationals: *"In the large pharma companies, decisions are made on different layers and take a long time. My advantage was that I understand the problems, the structure and decision making process in such larger firms. It helps the process because you know the problems they deal with"*. Anonymous4, entrepreneur of a medical tech company, elaborated on his experience and commercial

and technical knowledge of managing people: *"I have had technical positions, I managed production and engineering departments and as a commercial officer I gained a lot of experience over the years which helped me to search and get into contact with people"*. However, it is possible for entrepreneurs of small high-tech firms to stay in the company and manage it. Anonymous 10 followed education to train himself *"I 'am a researcher not an entrepreneur, I had to learn because, as an entrepreneur you have to be inherently open and in any case not afraid to go into the meadow world. I sometimes thought 'this is a nice technological trick, this will sell itself', but I was quick to realize that technology is far from a product. In my opinion, even less than one percent of what is ultimately a product of the company. I found out you really need other people to train and guide you because you do not have those qualities as a researcher"*. Furthermore, 9 of the cases mention that they have to be able to make economically risky decisions. Anonymous15 noticed: *"We searched for a new business partner and it involved an annual turnover of 1.5 million which is quite a lot of money for a small company like ours"*. This indicates a sort of pressure to do the partner search right in the first attempt.

Feel comfortable in uncomfortable situations

Further, CEO's and managers ought to have a certain **curiosity** towards internal people such as staff and external people such as employees from other companies, what they do and why they do it, that curiosity applies to every other thing that crosses their path. By constantly asking questions they can understand and test people with whom they work in order to assess reliability and gain knowledge and new insights about markets and technology. Further, the CEOs and managers should have self-confidence and embrace difficulties; they like to overcome setbacks, keep a positive attitude towards problems or issues and can also work towards them in a goal-oriented manner. In conclusion, there should be a form of fearlessness; CEOs and managers should feel comfortable in uncomfortable situations. They often had to start in situations where nothing was known (8 cases); no roadmap, no business plan or whatsoever. Anonymous6 mentioned: *"You have many materials of which you do not know what to do with them and what the properties are. Then you have a product of which you do not know how strong it should be. Further, there was no detailed business plan"*. Managers in this research embrace challenges and made several career changes to keep up a challenge and learn new skills (8 cases). This allows them to manage change in companies with a view to the search, find and selection of a new business partner for a sustainable collaboration.

So, it is beneficial for key people that are involved in the search phase, to step out of their comfort zone, to be easy in making contact with people and to be enthusiastic. To ensure the interest of target groups and potential partners, a broad understanding of the high-technology is needed to start the process. This indicates that later in the process more sophisticated and technological conversations occur **and other employees with a technical background might be involved**. Further, prior working experience in high-tech and larger firms are helpful, as these larger firms often are partners for small high-tech firms. Understanding the process in such a company can therefore fasten the whole collaboration process, because experienced managers know how these organizations operate. In addition, prior work experience in large companies may be beneficial because someone has already experienced collaboration processes and may be able to make better decisions. Being able to cope with stress and pressure are also important characteristics. Managers and entrepreneurs experience pressure, because of the wanted returns on investments by investors and because of important (financial) decisions with far-reaching consequences that have to be made. In 12 of the cases it is mentioned that the process of searching a business partner, is time consuming. Besides that, this task often has to be carried out alongside multiple other functions that entrepreneurs and managers have to fulfill. So, the time to find a new business partner is limited, and entrepreneurs and managers want to use it as optimally as possible.

4.2. New conceptual model

This paragraph answers the questions concerning the steps and decisions entrepreneurs and managers make. Additionally it shows why the people involved in the selection process choose a particular way of seeking and finding.

This paragraph starts with a **proposal for a new conceptual model based on empirical data that represents the most important findings. Based on the data, opportunity recognition is seen as a separate phase because this phase requires specific characteristics for recognizing opportunities in high-tech. Furthermore, 'pre-search' is proposed as a new phase.** This involves acquiring market knowledge, product knowledge and organizational knowledge that is needed to search and find a new business partner. In the 'search' and 'find' phases, entrepreneurs and managers try to find technological alignment (Emden et al. 2006). Additionally, they try to find strategic alignment (Emden et al. 2006) in the 'select' phase. The decision of entrepreneurs and managers to move to the next phase with a certain party is influenced by; **relational alignment, individual trust, commitment, personal bond and time to market. These latter factors flow through the entire process and according to the data are highly dependent on the individual.** Finally, **successful long-term collaborations often start with a small project** in which the strength of the relationship is tested before moving on to a long-term partnership. The phases are further explained in the next paragraphs.

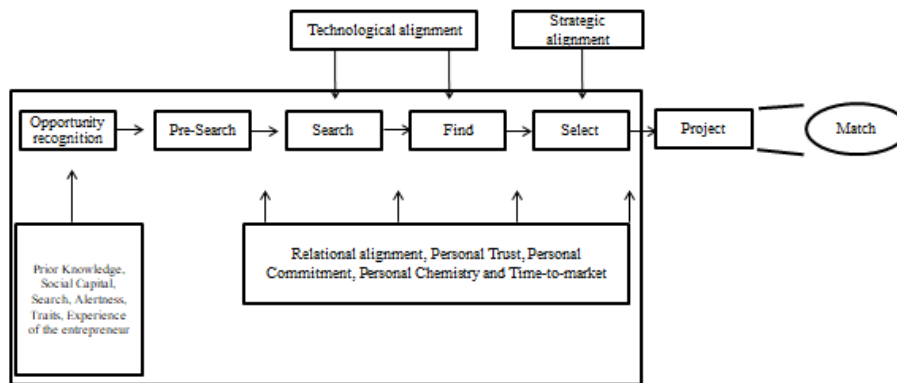


Figure 4. New conceptual model based on empirical data

4.2.1. Phase 1: Opportunity recognition

In appendix 3 a table is included that holds quotations of interviewees about opportunity recognition. Through opportunity recognition, innovations are discovered for which companies later have to look for new business partners. When analyzing the quotes, a number of things stand out. It looks like systematic search or alertness, mentioned in our conceptual model, had a more subordinate role and cannot be seen separately from each other. All cases show that **before a high-tech company is established, extensive research is carried out by the entrepreneur and founder of the company.** For example at the University during a master or a PhD research. The interviewees have come into contact with their subject for years and therefore acquire a lot of knowledge and experience. Further, entrepreneurs have had advise through contact with fellow students, teachers and business people is mentioned. Interviewees noticed that, when opportunities were seen, it was easier to use the same technology from their innovation in other fields of practice (9 cases). Anonymous2 mentioned: *“the principles remain fairly the same, I can also apply the techniques in different branches, although the technique is sometimes slightly different there”*. So, prior knowledge, social capital and earlier experience rather than alertness and systematic search are seen as important factors to recognize opportunities in high-tech.

4.2.2. Phase 2: Pre-search

Gaining Market knowledge

According to the collected data, entrepreneurs and managers have to become familiar with the market and the products to know what they should look for in a new business partner (15 cases). Therefore they have to **gain market knowledge** and **knowledge about their own company's capabilities** and strategy. They prepare themselves by looking at their own company, innovation and the expected market. The first question entrepreneurs and managers ask is; 'does there exist a demand for our innovation in the market?'. To answer this question, they test the market, for example by visiting exhibitions and end-users. Anonymous11 stated: *"Confirmation from the market, that's how it started, because you can keep typing behind your PC for a long time and think you have a great idea, but 'proof of the pudding' is about your future customers and your value proposition even though the technology is not yet fully developed, just pitch your value proposition. We have a technical idea and think we can do this and this and we see those and the advantages for your product, what do you say?"* Anonymous8 said that he first gained experience in a large pharmaceutical company to get a feeling for the practical problems that exist by developing the product and its effects in practice. In this case the unique properties of the product were tested. This method offered a quick way to get feedback from the end user about the operation of the product and made end users and potential partners enthusiastic. Additionally, he said *"We also hope to get as much feeling as possible with the end user, because if you start interacting about it in a too late stage, then your product is already finished, but it will not be used and time to market is very important in high-tech. Moreover, you see that the whole development is very costly, so if you can shorten that, then that is very valuable"*. Anonymous5, a former senior manager from a large Pharmaceutical company who started a new challenge as CEO of a high-tech company, used a sample of his product at a trade fair. He came up with a game: *"doctors and directors (mostly decision makers) are triggered to work with our products and test what the possibilities are. Afterwards, their personal details were collected and we all send them a personal letter, this works very well for us to build up publicity and to enthuse people for our product under a group that is interesting for us"*. So, if a high-tech entrepreneur quickly goes to the market with a first (test) version of the product or technology, the feedback from users can be used to improve the concept and to enthusiasm potential partners and end users. This can ultimately lead to a faster generation of the first cash flows and development of their product. So in short, this phase is focused on the possible future commercial value of their product, the understanding of the market and the possible future target group, that is, the end user.

Understand own company's capabilities

In 15 cases entrepreneurs and managers mention they define how they wanted to be identified as a company and what they could add to the market. Anonymous15 said: *"you first look at what is (.....) for company, what do you want, what can it do and what has it done in the past. Then you quickly look at what kind of company fits in with that. We therefore first looked at what the current supplier network looks like now, then together with another colleague we investigated 'what can we do? And who can we attract to make our growth possible?'"* This step makes clear what the company is doing now and what it still needs to do to take the next step in developing the product.

Business plan or 'learning by doing'

So, a business plan and future vision is made, but here too the answers differed; data showed that entrepreneurs and managers from larger companies often had clear written plans. **Entrepreneurs and managers of smaller companies (5 cases) invested less in a business plan and more in a 'learning by doing' strategy.** These entrepreneurs and managers seem to see a business plan as something that looks more like an obligation to raise capital, as Anonymous11 replied: *"You have to have a bit of an*

idea of the type of company and what you want to do with your technology, who can help a lot of patients. This has become increasingly clear over time, and at that stage we have received subsidies and investments to better shape that image, the business plan. There are always changes in course, it is not so you write a business plan and you can tick off every step. It is very dynamic, I also stopped writing the business plan, we now keep an investor deck and that is the summary of the company ".

This quote suggests that the primary reason for high-tech starters to write a business plan is to convince external financiers. They acknowledge that it is difficult to convince investors to invest their money in something that has not yet been fully elaborated especially when they do not know whether there is a market for it. The starting point is the same for all entrepreneurs and managers; knowing what you can do, what you are good at, what you want and how you want to do it. The difference is that one entrepreneur or manager spends more time on the strategy, future collaborations and also elaborates these findings on paper for everyone to understand, where others have the plan in their heads.

4.2.3. Phase 3: Search

Desk research, exhibitions and conferences

In every data case entrepreneurs and managers start their search for potential business partners by consulting (1) the internet and subsequently (2) visiting exhibitions and conferences. Interesting is that entrepreneurs and managers often know the future potential business partner company name (12 cases). This indicates that the business partners are often renowned parties, it also shows that managers and entrepreneurs have already done research as described in the pre-search phase.

Entrepreneurs and managers in this phase conduct desk-research on possible business partners; how these companies are structured, if it is privately owned or listed and how it is structured technically. This is often focused on the long term. If you are going to partner with a small business that goes bankrupt or merges with a competitor, the playing field will look completely different. A larger listed company, is often financially more stable, has been around for some time and has a responsibility towards the market. This makes the risks somewhat smaller. A lot of this work is done through Google. Anonymous15 who did not know the business partner by name at the search moment: *"We sometimes got the question, 'what if you did not discover a potential business partner on the internet?' That is possible, but then you can also ask yourself what does the company do to make it known? Because, it was no easy task in Google. We searched for a huge number of different terms and did not stop at page one, we continued until page 30 and beyond, but we also consulted overview lists through industry associations. So, when you are not on such a list as a company, then I wonder 'what kind of company are you?'".* The entrepreneurs and managers indicate that a lot of information was already known about their business partner before they started the search, anonymous5: *"Because there are only a few in this market you already know who can do something for you, we had a name, we knew who was responsible for what (through LinkedIn), we knew the organization and we knew the products, which is actually quite a lot, the only thing is that we have not done business with this party before ".* Desk research is a commonly used instrument to collect information in order to create a better understanding of the potential business partner and its capabilities.

First form of contact exhibitions, conferences

In all cases, first contacts between small high-tech entrepreneurs, managers and the potential business partners consist of face-to-face contact at an exhibition, conferences or through phone calls. Usually entrepreneurs and managers speak to a salesperson or account manager; the commercial people (12 cases). **The industry specific fairs and conferences are used a lot by the interviewees, because it is the place where professionals meet.** Anonymous5 explains: *"We find the end-users but also suppliers, competitors, technicians etc. at the exhibition. You can already find a lot of information*

about companies via the internet and then I am talking about what they do and who they are. Moreover, the high-tech world is small, there are often only a few companies that produce or can produce what you need at a certain quality level ". The last sentence of the quote is probably the reason that business partners can be located around the globe. Traveling is inherent to the business, people meet each other anyway. Why should you meet at an office if you can meet all professionals together at a certain place in a certain week. That is much more efficient. Additionally, it is possible to explain what your company can do, why you wanted a conversation, look each other in the eye, see the products and keep track on the latest developments. At such a conference or exhibition parties have contact, they speak to each other at product level. The goal is to arrange a follow-up appointment to continue conversation. In most of the cases (11), apart from an exception, entrepreneurs and managers send two delegates to the fair or conference; mostly a technical person and a commercial person.

Desk research and phone calls

Some entrepreneurs and managers (5 cases) preferred to make a call to gather information, because their potential partners already present themselves on the internet. However, when you make a call, you can find out the company does something completely different. It is the goal to make a short list and arrange a face-to-face meeting, as anonymous15 explained: *"we first have a general chat, then we explain first what we are looking for, that is also nice for the other party and then they also know a little how they can answer. Depending on what they say and what I am actually looking for, I just want to know what kind of company it is, in what kind of market they operate, who are the customers, do they have a lot of customers. You try to get an idea of what kind of people you have to deal with, whether they have already undergone major reorganizations and staff turnover in recent years"*.

Larger business partner

Entrepreneurs and managers in this research initially searched for a larger partner, which has the resources, manpower, distribution channels, market and product experience and the capital to possibly pre-finance, further develop and commercialize technology (13 cases). As anonymous8 indicates: *"For me it was important that the potential partner would have experience in developing a product for a comparable market, experience in making a medical device, because that has to meet many requirements, including the materials that have to be of a certain quality. Budget and timelines is also a very important one. We had just started, so we had very little financial resources"*. Entrepreneurs and managers of small businesses require complementary assets that larger companies own, so they depend on larger companies. This is interesting because the entrepreneurs and managers of high-tech companies **almost all (13 cases) wanted independence in order to develop quickly and be able to do this with every party that could help them further**. The entrepreneurs and managers often have good relations with universities, research labs, research experts and they are often funded by capital funds (14 cases). These are all sources that are interesting for large companies.

Some entrepreneurs (3 cases) mentioned that potential partners insist on becoming preferred supplier and guaranteeing exclusivity, but entrepreneurs and managers of small firms do not always want to go with this. Anonymous8 said: *"As a small high-tech company you are a tasty bite for larger parties and you have to keep your freedom and independence, the other party did not want that. They wanted more control with shares. But freedom is worth a lot to me"*. This was another collaboration that was stopped by the entrepreneur because expectations did not match. Further, in 3 cases entrepreneurs and managers tried to speak to the market follower as a strategic consideration, anonymous11: *"The dominant party in the market is often more reserved, you speak the number two or three that has everything to win. You try to find as many parties as possible and in the end it's all about how much they pay for it and who is most interested"*. Anonymous11 further hired a market research firm to

explore the offer of potential partners and establish the first contact at an exhibition. The market research firm had the experience, skills and knowledge of the market and anonymous11 was not on that level yet. So, if you want to fasten the process and do not have the market knowledge, it might be wise to buy this knowledge. In this phase it becomes clear that the participants searched 'broad' and spoke to a lot of potential partners.

Technological alignment

Additionally, in 15 cases is mentioned that both parties try to develop a mutual understanding of technical capabilities, technical resource and market knowledge to test each other's suitability.

Anonymous3 mentioned: *"we speak at a product level and discuss mainly what it does, what it can do, what I can do and what we can do together. In addition, we discuss what the market looks like"*.

Anonymous11 added: *"We try to explain in technical terms what we can do in order to get an idea whether we can be of value for each other"*.

Further anonymous3 mentioned that the other party saw their technical capabilities: *"I think that with regard to our technology, we have technology and expertise that no one else has in the world and what acknowledges, so they see the value of it"*.

Further, participants indicated to understand the culture and organization structure in order to build trust and the importance of whether the partner wants to enter into a long-term relationship,

anonymous7: *"Because we wanted to grow, it is important to know for the continuity of the company whether they can handle a higher production and engage for a longer period of time in a collaboration"*. Due to the growth of the small high-tech firms and the newness of the innovation both key persons involved from the partnering companies required adaptability in advance.

4.2.4. Phase 4: Find

Towards a sophisticated company selection

Once the conversations are done, 13 participants indicated that several phone calls are conducted and emails send to get a better understanding of the technology. Based on all this information together a short list is created. This means that based on earlier and general conversations in the search phase entrepreneurs and managers have made a more sophisticated selection based on technological alignment and individual trust, commitment and personal bond (9 cases). These are the companies who can expect more interest by receiving a second call for more information or a face-to-face meeting at the partners head office. The first conversation is general and can best be compared with a company presentation and a beginning to understand each other's technology. When entrepreneurs and managers focus more specifically on the technology, all participants required to sign a non-disclosure agreement (NDA) before speaking about technical specifications.

According to the data, in eleven cases, three to seven companies on the short list get a company visit, this is done by a telephone call or written (email) appointment. The visit often starts with a presentation of both companies with their products and in addition the reason for the meeting is made clear. During a company tour, the entrepreneurs and managers get an idea of **how the potential business partners work, the atmosphere in the company** and the **identity of the company**. That is important because as anonymous15 indicated: *"Every company in a manner of, can do what you want them to do, that makes it difficult, companies want to push their boundaries and you also visit companies that you think 'well ... I do not know if they can do it, 'but I don't want such a party, because when we really run into problems, then I am busier with their growth than with ours"*. He further indicated that, by walking around on the premises and in the building, he could quickly see whether the agreements made are being realized, whether there is rubbish on location, or whether people can move to other spaces without identifying themselves, other participants confirmed this. This indicates whether the culture and identity of both companies will match and it helps to build trust

concerning the possible collaboration, it also refers to relational alignment. Relational alignment is discussed later in this thesis, because this factor influences the process at several moments. The company visit is an important indicator for entrepreneurs and managers to get an idea of the possible partner and it may also be important to decide whether or not to continue with a possible partner in the process.

Technological alignment

According to the data, commercial and technical skilled persons from both sides further start to recognize the potential partner competences which can be used in joint activities. Further, in all cases, the potential partners possessed technical resources and market knowledge that were different but complementary to one other. Anonymous3 said: *"We are very good at helping the designer bring the designer to manufacturing. Then you have here (.....) and (.....) and (.....) above, they are all software partners and they have a different product but are complementary to what we do. So we are actually a kind of spider in the web and they have a large market share but also because they also focus very much on the bottom of the flow so we are of added value"*. Further, in the cases studied, there was only slightly overlapping knowledge. That might be the reason why there are several conversations needed to understand each other's technologies and products. Everyone in this collaboration is an expert in their specific area and together they can create value.

Several contact moments after the visit

After these visits, information is shared through email and phone calls. Additionally the findings of the visits are communicated within the company of the entrepreneur and manager. In this way engineers and other people within the company get more involved in this process. Entrepreneurs and managers develop a short list based on individual opinions and feelings.

4.2.5. Phase 5: Select / Decision to collaborate / Forming contract

Selecting (a) partner(s)

According to the data, a select group of potential business partners' remains and these are all good options to work with. However, the decision to select a (or several) business partner(s) depends on a lot of factors. The most important ones refer to the very beginning of the process such as **welcome on-site, personal bond, mutual trust, mutual commitment and time-to-market** (15 cases).

Anonymous15 selected the partner from five other parties and declared: *"I saw that the five remaining parties were very close together, at least you cannot say that they perform worthless, because than it would have been an easy story. So, you start to look more at feeling, so with what kind of people do you work, then it becomes trivial of what you pay attention to. But, I think that's where the power lies, the things that you cannot really quantify. So, how did they welcome me, what happened on the work floor, how much attention did I receive, did they react quickly. These were things that really started to play"*. Another interesting finding is that **in six cases, collaborations with other selected parties are also started in order to be flexible and not fully dependent on one business partner**. But even then, the degree of cooperation ultimately depends much on the organizational structure of those parties and the benefits it offers as anonymous10 said: *"The American club had an agent in Europe, so any question we sent or called to America was forwarded to Europe and an agent is only interested in selling the product, they did not do any development"*. This quote indicates that **corporate structure, culture and hierarchy** can have an important influence on whether or not to engage in intensive cooperation. In six of the interviews it is indicated that small activities are being carried out for these large companies. That could include; providing a license or a plug-in integration, but if there is no technical support from the other party and they have a 'closed mindset', intensive collaboration becomes difficult.

The selection and decision to work together is a learning process in which information is collected and used for a subsequent conversation, this was mentioned in six cases. Anonymous7: *"because you have seen several methods, materials and prices, we played a little bit with the knowledge that we could get from the tenders, phone calls and e-mails each time. This has been a four-week process, we were in a hurry so it went very fast"*. This was the first collaboration for this manager, the knowledge and experience from this collaboration was used for the next and current business partner. Because the success of a business relationship can never be estimated in advance, there will always be a kind of uncertainty in the decision to collaborate (15 cases).

Gradual process

Further, entrepreneurs and managers stated that it is very difficult to determine specific moments in the process because the selection and decision to collaborate with a new business partner is made almost at the same time, it is a very gradual process. After the decision has been made, the parties with whom no collaboration is established will be notified by telephone or email (9 cases). It is important that this is done nicely because you might need each other in the future. Further, **from this moment employees from both sides will also communicate intensively with each other**. This takes place after a personal discussion with the entrepreneur / manager and the key contact person from the business partner in which joint, but corresponding goals are discussed.

Strategic alignment

The conversation about the alignment of goals and motivations aims to make clear that both parties strive for mutually beneficial intentions. It also determines whether they will enter in new joint development projects and thus; a sustainable, long-term collaboration. After all, a one-sided advantageous cooperation is doomed to fail, all entrepreneurs and managers noticed the importance of a win-win situation. **It does not mean that both parties are also pursuing the same goals** as anonymous3 shows: *"We have technology that no one else in the world has and what our business partner recognizes, so they see the value of it. Further, our software cannot be sold by simply downloading it from the internet, they need education and support from us. We find it nice to work with them because they are a large technology company, but also market leader. We now have access to a large market"*. Some managers will argue that they have a common goal, but in reality they are different. However, the differences might be the reason for success in a collaboration because the company's complement to each other with their own specialism and resources.

Forming contract

Short after the decision to collaborate is made and goals are aligned, a time-bound contract is drawn up (14 cases). Anonymous11 stated that this contract comprises in broad lines on which parts the collaboration applies, such as technical aspects, manners, business conditions, the goals to achieve and a 'no-go' part that states that if things do not seem to work the collaboration will stop. Moreover a financial and protection part is included. This part describes how involved parties deal with costs that arise from the collaboration and what is done with joint technology results, because both parties bring in technology. Besides that, entrepreneurs mentioned that both parties have to distribute the earnings that arise from it. Additionally, this sometimes difficult conversation can go smoothly through a strong mutual bond as was said in seven cases. The most important characteristics of such a contract are clarity and the possibility to keep in touch with each other. Because, when the conversations do not go well, it is possible to point to the contract.

By working on the formalization of the contract, entrepreneurs and managers reduce misunderstandings and increase mutual expectations. As a result, the **negotiation process contributes to the success of the collaboration**. Due to the strong bond, the contract is more like an operational task which is further explained in chapter 4.3. The negotiations and the signing of the contract are always face-to-face, while small adjustments to the contract are solved by email (15 cases). The practical side of the collaboration, according to the entrepreneurs and managers, will be discussed during or short after the signing of the contract.

4.2.6. Phase 6: Project

Short term projects

Data shows that a long-term collaboration starts with a short term project (15 cases). Based on the issues and experiences in practice an evaluation is made. This determines whether entrepreneurs and managers decide to work on more projects with the same business partner. Anonymous9 explained: *"What works great for me is starting a project, working together with all the stress and payment problems, then your relationship is really put to the test and you really face each other. You can announce a partnership in advance and make extensive contracts, these are all good intentions, but it is about how you work together, then you can say afterwards whether it is good and if necessary continue and formalize"*. Thus, people can have a strong bond and the feeling can be good, in practice they experience what happens when people are under pressure and have to meet deadlines.

Measure success

According to the empirical data, successes of collaborations are diverse for all entrepreneurs and managers. They all agree to the **importance of the qualitative aspects**, because the successfulness of a collaboration is not fully dependent on goals, return or other commercial driven aspects.

Collaborations in high-tech might be challenging and as a consequence the targets that have been predetermined might not have been met. Further, there could have been issues during the collaboration, the way these are handled is also important in the evaluation process (15 cases).

Anonymous1 gave an opinion about the perception of success: *"Successful cooperation means that people work together in a communicative way and do things well together because you share a common interest and have built a strong mutual bond. We both deserve something, and he delivers quality because it is also important to keep our business going, so we do not have any problems with the quality, I call that a success, together striving for a victory"*. These findings emphasize what the presence of a strong mutual relationship can do with a collaboration. However, entrepreneurs and managers mentioned that collaborations have been set up to make two companies better, also from a financial perspective (15 cases). Goals such as sales, a technical level of quality and profit are certainly important for small high-tech entrepreneurs and managers.

4.2.7. Phase 7: Maintain relationship / Match

Regular communication

There is no written rule that unequivocally leads to a successful cooperation. However, all successful cases had in common that they communicated on a regular basis in orally and in writing. During the collaboration **communication takes place across different levels of both companies** (15 cases). Data shows that communication is more intensive at the moment when deadlines have to be met or when a project has just started. This manifests itself in **daily phone contact between operational people** (10 cases), **weekly phone contact at management level** (13 cases) and **monthly to once every three months through a company visit at management level** (11 cases). Besides that, key persons of both sides meet each other at fairs or conferences (12 cases). Regular contact is necessary as evidenced by the results, anonymous7: *"A few times we have been waiting for each other, both*

parties did not know that we were waiting for each other. We need to have drawings to order parts, then I asked if they had already sent those drawings. They replied that they did not know we would need them to order parts. As a result, nothing happened for a week. From that moment we appointed someone who maintains daily contact to make everything run as smoothly as possible". This contact is mainly business-related, it is about discussing the progress of projects and bottlenecks that people encounter (15 cases). In case of problems, it is important to make a call, even for very small issues, because small issues can evolve to big problems over time.

Using networks

In the cases studied new projects have been started or the current joint project was further developed, through information and knowledge sharing. Additionally some parties (7 cases) used each other's network to try and find new opportunities with different kinds of partners such as government, universities, research partners, and business partners etcetera. The advantages of using the partners network is that they can rely on references and the reputation of a particular party through information that cannot be found anywhere else, namely information and experience of the business partner, anonymous8: *"We are expanding our network quickly via our business partner, people know how to find us and we can easier find the specialists we need. Further, it is easier to retrieve references".*

4.3. Influencing factors

During the analysis of the interviews, it became clear that relational alignment, trust, commitment, personal chemistry and time-to-market were the factors that could be related to every stage. Moreover, when decisions had to be made during the process these factors were decisive towards selecting a potential business partner. Below the findings considering the drivers of these factors are given.

4.3.1. Relational alignment

Entrepreneurs and managers in this research mentioned the importance of the **propensity to adapt** (8 cases), **compatible cultures** (13 cases) and the **long-term orientation** (15 cases) in and between the stages. Surprisingly this corresponds to Emden et al. (2006) relational alignment, which consists of three subcategories; compatible cultures, propensity to change and long-term orientation. Without these factors it is hard to start a collaboration that stands a long term partnership, like anonymous7 mentioned in paragraph 4.2.3: *"Because we wanted to grow, it is important to know for the continuity of the company whether they can handle a higher production and engage for a longer period of time in a collaboration and they saw the long-term value and knew they did not have to expect a lot of return in the short term".* Additionally, anonymous6 says: *"For both of us the long term was very important to guarantee the continuity of the product and company. We cannot just switch between partners, because there are no thousands of providers. And they also invest in a smaller company, us, which entails uncertainties".* Further, the comparison with a relationship was made by entrepreneurs and managers, a relationship evolves over time; you meet someone, take her out for a dinner, get to know her parents and so on, that goes with business partners as well, they mentioned. Further, anonymous 11 says: *"We have had delays and the wishes changed in the meantime. For both sides adaptation is important from the first moment you meet each other ".* Concerning adaptation, anonymous7 said: *"Our partner also recommended certain materials because they were cheaper and much more editable, and we were therefore more prepared to say, we should try that".* Anonymous3 mentioned the propensity to adapt as the requirements and stage of a collaboration change over time. You see that if more money can be made, relationships become more businesslike. *"So, what we used to do for each other and how we dealt with each other, like ask for a license of the software, that will be fine. That is no longer, they will have to pay now".* Entrepreneurs and managers mentioned that this

long-term perspective and the propensity to adapt starts in an early stage because of the costs and time associated with a collaboration, and because the process of collaboration is full of uncertainties.

4.3.2. Drivers of personal trust

Reputation

Reputation is a driver of trust. According to the interview data, this reputation can be created by various **external sources such as corporate websites** (13 cases), and **sources such as the qualification of managers and technical staff** (10 cases). On the internet for instance, there is no interaction with people, so the company website is analyzed too see how a company presents and profiles itself as anonymous⁷ indicates: *"As CEO you also look a bit at your own branding, so you look continuously at which party suits our firm, you look continuously at the logo, at the layout of the website and what type of company it is and then you would like to work with high quality parties and not with some sort of junkyard with all respect, so you are constantly looking for a party that wants to be on the same level as we do".* Further, anonymous⁸ noticed: *"During the conference, we were looking for a development party, but we also wanted the party to have a proven experience with the type of product we intended to develop. You can still see managers of companies who consider this a nice challenge to do a new kind of product. We have to do everything ourselves, so our development partner needs experience, qualified engineers and capital to help us further".* Reputation indicates that collaborating with a larger, experienced partner ensures that the initiated innovations can be easier realized within the time and budget limits. For high-tech entrepreneurs and managers, this is of great importance as they operate in a very uncertain environment.

Working and life experience

Trust according to the data is further dependent on the individual who leads the process and the working and life experience of this person (9 cases), as anonymous¹ a former manager indicates: *"Based on earlier experience I always have a healthy mistrust and I try to eliminate that by asking stupid questions, by 'fishing', trying to see if the person is honest. For example, I ask something of which he should actually say 'that it is a stupid question'. In 6 out of 10 cases, someone just tells you things to do business with you, to earn money from you and at such a moment I'm done with it. I am looking for an honest answer, because I already knew that is was a stupid question. So I try to find confirmation of what I feel".* Based on earlier experienced situations in working life, anonymous⁴ emphasized: *"Through my years of experience I look closely at the posture, the attitude of people and ask questions at certain points where you see people doubting. I do this to build trust".* The individual trust based on early life experience and work experience tends to strongly influence the first phase.

Openness

Another, important factor 13 participants called is openness. Anonymous⁴ says: *"My business card is very showy as you can see, but I'm the first to admit that things go wrong. So, also showing a piece of your own weakness, that gives confidence to a person. Further, I also know various parties that are very closed and anxious to sell their ideas. Just when you are not open, people start to look for all sorts of things, that is disastrous for your trust".* Anonymous¹⁵ told that openness is very important, he gave an example: *"I think you will get the most fruitful collaboration with another company at the moment you dare to expose yourself, that you dare to be vulnerable. You cannot remain independent, because when you have a product and you let it develop at another company, you are actually already entering into a kind of marriage".* Often openness in high-tech is enabled after the signing of an NDA. Every participant signed an NDA before going into detail. An NDA offers two parties the opportunity to exchange confidential information. In the NDA it is agreed what information is secret, for what purpose information is provided and what the receiving party can and cannot do with it. However there exist different forms of NDA's, therefore entrepreneurs and managers demand that NDAs are

made two-sided so that both parties can provide and receive confidential information. Further, an NDA is meant to getting to know each other before continuing a collaboration agreement. The parties involved at this stage don't experience difficulties with signing this contract, anonymous1 noted: *"after the first conversation we go more into the technical details so, we work with an NDA. When you trust each other, it is no problem to put both signatures under the NDA, actually that is a confirmation of trust. This is important because if you want to work together with a party, you will still have to release technology to see if the other party can perform anything with it, because you do not know that in this high-tech world"*.

Organizational and cultural similarity

Besides openness organizational and cultural similarities are drivers of trust. This driver is especially applicable during the company visit in the 'find' phase, anonymous15 mentioned: *"You try to get an idea of what kind of people you have to deal with, whether they have already undergone major reorganizations and staff turnover in recent years"*. **During the company visit, entrepreneurs and managers experience the staff, structure and identity of a company** (15 cases). It seems that entrepreneurs and managers will have more trust in their potential business partner if they are not threatened by the way the other party conducts business. However, the participants worked with larger business partners which means that organizations are not the same. Additionally, this suggests an imbalance between the two sides, but anonymous8 says: *"The way of dealing with each other is important, you have to speak each other's language"*. Entrepreneurs and managers prefer to deal with like-minded people and therefore act with people who speak the same 'language' (8 cases).

Social networks

Social networks are seen as one of the last discovered drivers of trust from data (10 cases). Anonymous5 said: *"My network is mainly in another sector, here in the medical world I had to start all over again. If you need something then you often try it through people in your own network who know other people that you need. It is a fast track and it creates trust because the joint contact can tell something about both parties"*. In addition, the social networks that are developed by talking to all kinds of new people at an exhibition for instance lead to information about potential partners. This information through conversations can increase trust in a partner. Four entrepreneurs and managers further used references via unknown persons; when a person or company is mentioned several times by different people in a positive manner trust is created and gives the possibility to collect data that is not available via company websites or other internet websites.

Intuition

In this research intuition (15 cases) is based on early work life experience and prior learning. Experienced managers could use their prior information and earlier experience in similar situations to develop judgement. Anonymous15: *"You already feel whether what is being said or that can be realized in practice, I do have a list with requirements, but this is simply not quantifiable, but very important."* In this particular case extensive research with a list of criteria was conducted. So, intuition could be substantiated with quantitative data. But also less experienced entrepreneurs called intuition and compared it with a job-interview, anonymous8: *"you only have a limited number of contact moments, based on that you get an impression of how you could work with someone and make a decision"*.

4.3.3. Drivers of personal commitment

Efforts outside office hours

Seven entrepreneurs and managers perceived actions and delivering products outside of the

agreements as a sign of showing commitment. Think of sending technical drawings outside the office working hours (2 cases). Anonymous13 told: *"they are a party where you can also receive or send something outside the standard delivery procedures, because you need it just two days earlier"*. This situation stems from the selection phase but, also in the earlier phase exchange of information, is needed, for instance align technical resources.

Eagerness

Another driver is eagerness (10 cases), anonymous15 says, a company visit is also an important test for entrepreneurs and managers to test the eagerness. Participants rather prefer to work with people who are enthusiastic themselves than with people who 'just' carry out an assignment. Additionally, in larger firms management or senior managers are often involved in the collaboration process instead of directors. When a director presents himself at a company visit, it shows that the firm is highly interested and committed to the technology and collaboration (3 cases). Additionally, anonymous7 told: *"At the moment that potential business partners say, you can come this afternoon or tomorrow and then react very proactively then you know that they would really like to work with you too. In addition, it is mainly the signal that the other party thinks with us in a kind of workshop manner, they see a technology, they see a young company with ambition, they see the long term and know that they do not expect a lot of turnover in the short term"*. Anonymous6 added: *"after we have been with them they have been with us and they even recorded a promotional film. And from that moment on, we also have very good contact with them because they have also invested in us, they think along"*. Another subject entrepreneurs and managers mentioned was that the potential business partner asked technical questions between the phases to understand the technology (11 cases). This was also interpreted as commitment. During the company visit the entrepreneurs and managers, speak to engineers. After the visit, those people have to think about the technology issues internally and then come to the entrepreneurs and managers of the small high-tech firms with questions via e-mail, *"have we understood this correctly?"* It gives a signal that they are serious about the product and the collaboration and want to do this project together.

Involvement of skilled employees

Involvement of skilled employees is an important driver. This creates a mutual understanding and shows the commitment of both parties, anonymous9: *"I do notice that I 'connect' better with people who have got a technical background because they know better how it works and it gives me the feeling that we understand each other more quickly"* on the other hand anonymous13 takes a technically skilled person with him to potential partners: *"I often taken my head R & D to partners, because I do not know enough about chemistry but have made the effort to take the main responsible R & D with me. People find it nice that you do that "*. These quotes mainly apply to the beginning of the process, but remains important later in the process when teams are formed for a project. Anonymous12 states: *"It is a shame if a partner puts engineers on a project who just starting their career and actually do not know exactly about it "*. Anonymous15 could solve this by entering into a conversation: *"A good example is the last project, they have a very young team on the project and we have a more experienced or old team at least forty / fifty plus". Internally they thought what is this? they do not take us seriously, and what do we have to do with that? "I then phoned my contact person there and they made sure that two senior employees were added"*. This example indicates that the involvement of qualified personnel has a major influence on the deployment shown, this applies to both parties. By putting good co-workers on the cooperation, both parties show that they will strive for joint success. It also decides whether there is sufficient basis to move on to the next step in the process. In addition, the mutual bond between key actors makes it easier to solve many problems by entering into the conversation.

4.3.4. Driver of personal chemistry

The data shows that the **personal bond** of the entrepreneur, manager and the business partner is very important (8 cases). This bond becomes stronger through the process; the mutual contact becomes more informal. Anonymous13 indicates: *"I know what his hobbies are, what his house looks like and what he did last weekend. So, you are trying to build a bond and that also means that the trust grows and you have that little bit extra for each other"*. Anonymous11 told that they were drafting the cooperation contract, which can be erratic, because there may be something overlap in the technology or its outcomes. Anonymous11 said: *"We already had such an open communication and strong personal bond, we did not want to wring each other out. There must also be a synergistic model that is acceptable for both parties"*. This bond is built up by having a lot of contact through mail, phone and face-to-face meetings, dinners and discussing of informal topics. Because of this mutual bond people can overcome a lot of problems together. Consultation becomes easier and there is more mutual acceptance. However, the strong bond of a personal relationship in collaboration can be a weakness at the same time (4 cases). When one of the key persons leaves the company or gets another job in the same company, the field can be completely different and the project might stop. Anonymous2 declared: *"Short after we concluded the contract and started to practical implement the agreed effects, the business unit manager got another job and left there. That did not do the collaboration well, so we finished the contract but we are still working together because they have come to realize that our product has added value"*. Additionally anonymous1 experienced a similar situation: *"I also had to deal with a change of our contact person and there was no connection, in fact we were on a collision course. That is neatly told and eventually the relationship is recovered"*. So, this is a reason to screen the potential partner candidates carefully. Because due to insurmountable problems, such as not being able to work together, the collaboration can stop or the collaboration must completely be rebuilt from scratch.

4.3.5. Time-to-market

Time consuming process

The data further showed that time-to-market is a driver for entrepreneurs and managers to make (fast) decisions (11 cases). Entrepreneurs and managers of small high-tech companies do not want to wait too long for an appointment with a potential business partner, because then valuable time is wasted. The faster their product is on the market, the less costs and the higher the competitive first mover advantage. Data shows, it takes up to five months from searching a potential business partners on the internet until all the company visits on the short-list have been completed (12 cases). It cost a lot of time to search the internet, figure out information, create a list and make a planning. In the meantime, there is plenty work left with own technology development and managing the company.

The question is whether market demand exists, as anonymous12 stated: *"We were looking for an extension of our machine, a sensor system that could carry out measurements through our processing head. A number of specific requirements were required, but at a certain point in time we met someone at an exhibition. We agreed to pick this up together when the market would be ready and half a year later, a call from an EU project came along and together we wrote a project proposal for it "*. In addition, the question is whether both companies already have the required technical level, which is necessary to be of value to each other. Anonymous14: *"In the beginning we could not do what he wanted and he could not do what we wanted. However, there was a market demand, we were both not yet ready to serve each other well, but have made the decision to do a project together, he had confidence that we would come where we should be for the project in terms of skills"*. So, besides the, trust, commitment and personal chemistry, it depends on the time pressure, technical readiness and compatibility of both parties, whether entrepreneurs and managers make the decision to collaborate.

5. Discussion

This chapter discusses and explains the meanings of the results from this research. The aim of this research was to study how entrepreneurs of small high-tech companies search, find and select a new business partner to develop a successful and sustainable relationship.

Opportunity recognition

The expectation was that entrepreneurs recognized opportunities through systematic search or alertness, because these two are practically the opposite; active search is required when alertness is low. Additionally, the current literature noticed that opportunities “pop-up” suddenly, however **in this research, entrepreneurs develop opportunities over-time. The process of opportunity recognition required years of extensive research, lots of tests (experience) and guidance by experts** and that finding is contradictory with the current literature. Further, during the education there is guidance of fellow students and researchers. This seems to be an essential detail. Entrepreneurs cannot do without the specialist knowledge and expertise of researchers and the advice and new insights from fellow students and thus rely considerably on their social capital. However, it is difficult to measure to what extent these researchers and students have an influence on recognizing opportunities. Furthermore, Baron (2006) also talked about recognizing opportunities in the market. Entrepreneurs by their character; a strong sense of achievement and a firm belief in their own initiatives (De Jong, Overweel & Janszen, 2003) first develop their idea and then investigate if there is a demand for it in the market. Interviewees suggests this is also a reason why entrepreneurs often drag on the market for years and already know what is needed in 30 years. This explanation makes clear that **prior knowledge and social capital, more than active search and alertness, are the foundation for high-tech entrepreneurs to recognize opportunities**. That is why all the opportunity recognition factors cannot be viewed separately from each other. Further, some entrepreneurs noticed that they were able to apply techniques in different branches based on experience. This refers to the pattern recognition framework of Baron (2006, p.112); knowledge of a particular market, industry, or group of customers, for instance, would help entrepreneurs know where to search for new patterns that suggest business opportunities. These cognitive frameworks, in turn, can facilitate the identification of new opportunities. In short, based on their experience these people were able to ‘connect the dots’ and found new opportunities for their company.

Investors influence

As soon as the product goes to the market capital is needed. The results show that when this happens, entrepreneurs turn to provinces, governments and venture capitalists. These people, especially the venture capitalists, require a certain return on investment. However, entrepreneurs tend to remain independent and according to the data do not like managing a company or seem to not have the capabilities to manage a company. So, they weigh these requirements and leave the company or take the place as CTO. These answers can be linked to earlier research, Schumpeter (1934) mentioned that entrepreneurs typically do things that have not been done before and do not fit in established societal patterns. However, these often technological smart people lack the experience and skills to build and manage a company. Furthermore, investments are often risky ventures for investors, because it takes quite a time and a lot of money before they generate proper money. To limit the risks at the front and mitigate the risk that a competitor may accidentally be involved in the same innovation and is going to the market faster, investors often require intellectual property, patents and other people on key positions such as that of CEO. In short, the process of idea to development is influenced by at least two people, the entrepreneur and investors. In order to develop a successful and profitable product different competences are needed in the process of opportunity recognition and the search, find and select process. Therefore opportunity recognition seems a previous phase of pre-search. In this phase

an idea is developed into an innovation, but it cannot be sold directly in the market because it is not complete.

Pre-search

Pre-search is the new phase, all entrepreneurs and managers emphasized that the process starts by their own company and the market to be determined in the future. So; what kind of company do they want to be, where do we want to be within a certain time period and with whom. Although not all surveyed companies had a well-thought business paper strategy, they did start the process by looking at their own company, strategy and identity, which is in line with findings of Vanhaverbeke et al (2012). Literature on partner selection does not deal with this pre-search phase while it is very important. It is the starting point from which the future steps and potential business partner ensues.

Search

Entrepreneurs and managers explore the market online, using desk research. However, it remains difficult were offline search starts and online ends. The results suggest that the choice for search type, offline or online, is based on personal preference, budget or time. Entrepreneurs and managers search partners through online and offline sources. The possibilities are endless, certainly in this day and age. Many participants in this research use conferences and exhibitions to collect information and establish the first personal contact. The disadvantage is that they have to wait until these events take place. However when they take place, they are able to speak to a lot of people with a shared interest. That is why, firstly, it is suggested that offline search of potential partners in high-tech is more important, because people have to wait longer before events finally takes place. Secondly, entrepreneurs and managers are prepared to wait because they can see the techniques of possible partners at events. Thirdly, decisions often depend on the survival of an organization and because of the large amounts of money and resources involved people want to look each other in the eyes. Therefore, the success of a possible collaboration starts during the first contact moments, where involved persons present their company; what the companies can do, which products it develops and which problems it can solve. This partly corresponds with the first phase of Emden et al (2006) which states that managers first develop a mutual understanding of the technical abilities, technical resources and market knowledge complementarity. However, in this 'pre search / search' phase the shared information does not often go as far that an NDA is required.

Find

Consistent with findings of Emden et al (2006), this study shows that entrepreneurs and managers first try to align technical abilities, and technical resources, which is the first phase of the partner selection model of Emden. During the second meeting, entrepreneurs and managers visit the potential business partner to determine whether the people and the company fit theirs. According to Emden et al (2006) this comes in the final phase, namely; relational alignment after forming a team. However, according to this empirical research, relational alignment can be found through the whole process because the long-term relationship and the tendency to change must be taken into account in every step and every decision. While the techniques in this phase might be not fully developed, the company visit and subsequent contacts through email and telephone are used to get a mutual understanding of the technologies and the market.

Select / decision

This study shows that when there is still a choice to be made between different potential partners, entrepreneurs and managers link to the start process. All remaining companies on a short list are often equal in terms of skills. Now it is the mutual bond that is the deciding factor. In the selection phase and short after the decision making goals and motives will be aligned. This is consistent with Emden

et al (2006). But, according to this empirical study there will not follow a third phase of relational alignment because this phase can be found in every step and every decision. The existence of compatible cultures and understanding of a long-term relationship is crucial before goals are set and staff is introduced to each other. When key people are involved, this process seems to go smoother because they have built up a strong bond. They therefore can more easily compromise. Teece (1986) noticed the importance of a contract in case of hazards, certainly when complementary assets are specialized. This is recommended because often one or both sides have to commit to irreversible capital investments, these investments become valueless when the relationship breaks down.

Project

A lot of successful collaborations start with small joint projects in order to experience the collaboration in practice and see how both partners react when they experience stress or financial issues, literature so far distinguished short term and long-term collaborations (van Echtelt, Wynstra, van Weele, & Duysters, 2004) but did not mention that long term collaborations start with short term projects in which entrepreneurs and managers have already expressed a desire to enter into a long-term partnership with each other. Based on this phase, key persons decide whether to do a new project. So the success of a collaboration is highly dependent of the strength of the bond between staff and key persons.

Influencing factors

The entrepreneurs and managers in this research made decisions based on the following factors; trust, commitment, personal chemistry and time-to-market. These factors fasten or slowdown the search, find and selection process to a large extent.

Relational alignment

The data in this research showed that long-term relationship and the propensity to adapt are mentioned much earlier than prior research showed, namely; during the search and first contact. A relationship evolves and both parties have to be able to adapt to the circumstances and developments. According to the data, establishing a team takes place as soon as the selection of a future business partner is certain. Emden et al (2006) mentioned this phase as the last one, short after a team was established in their emergent theory of partner selection.

Trust

Reputation

Reputation in this research was based on the image and visual observation of the website of a potential partner for instance. This reputation is important for both sides, because the often larger business partner has to collaborate with a small high-tech firm that often does not have a track record or something. The finding that experienced CEO's are chosen by investors to further build the small high-tech firm might also have an influence on the reputation of a small high-tech firm. The education and professional credentials which managers bring, contribute to the reputation. Bierly and Gallagher (2007) also found reputation as a driving factor of trust. Their study showed that a stronger reputation will increase trust, because others will know more about the firm and therefore there will be less uncertainty. Furthermore, they mention that a reputation of being a 'fair and considerate' partner, ensures that managers will be trusted more than managers who, for example have a reputation of taking advantage of their partners.

Early life and working experience

Rotter (1967) found that an individual's propensity to trust strongly influences trust during a first meeting. They also state that this will be less important over time, as the individual learns more about the business partner. These findings are consistent with this research. However, they also found that an individual's propensity to trust is based on how people are treated from an early age by their parents and friends. This study did not find this because this topic was not included in the interviews. However it is likely that this would affect the process. This research did find that entrepreneurs and managers were often good of faith with the signing of a confidentiality statement. The idea behind this is that by trusting the other, the behaviour of the business partners will be influenced. This seems to be consistent with McKnight, Cummings and Chervany (1998) who mention a 'trusting stance'. It means that trusting a partner will lead to a trustworthy behaviour by the partner. Bierly et al (2007) showed results of prior partnerships which influenced the willingness to trust a new partner. This research showed that, working experience and guidance on previous collaborations with other companies influence the trust managers' experience.

Openness

Entrepreneurs and managers stated that openness was an important driver of trust; it made it easier to go to the next step. Openness, for example by showing weaknesses, has to come from both sides. However, this is also national cultural based. Bierly (2007) mentioned that national culture indeed would influence the propensity to trust. Arranging meetings with Dutch business partners are therefore more likely to succeed faster. Additionally, anonymous13 and 15 mentioned that their companies changed from a closed to an open culture, openness therefore includes an entire organization. Also, people working in a company with mutual trust might trust others outside their company faster. According to Bierly (2007) this also is the basic element of a company in trusting new business partners.

Organizational and cultural similarity

Entrepreneurs and managers have more trust in another firm or manager when they feel comfortable. Especially during a company visit where they experience the identity, work routine and the way of doing business of a business partner. Business partners were often larger companies, this means that the organization structure can be different. However, these companies often work with a head engineer, engineering teams or business units which allowed for a more similar kind of working method. Anonymous15 saw the director of the business partner company washing cups and clearing junk on location, which gave him a good impression of the culture that prevailed. According to Bierly and Gallagher (2007) greater understanding of the organization and culture help managers to feel more comfortable with the business partners operations and therefore increase trust. Additionally, these observations were one of the main reasons to decide to collaborate with this partner. Vanhaverbeke et al (2012) stated that firms of similar sizes are more likely to trust each other because they experience less threat of a larger firm, for example in its power to take advantage. However, in this research entrepreneurs and managers of small high-tech companies collaborated with larger firms. It might be that the form of collaboration plays a role in this, a strategic alliance for instance, requires that people working together even more intensively than the investigated cases. It might also be that the urgency was high, because without the resources of the business partner it was often impossible to further develop a product.

Social networks

At exhibitions and conferences entrepreneurs and managers start conversations with new people from new potential business partners or end-users. These conversations provide information that enables a more sophisticated evaluation of the potential partners and thus increases trust and confidence in a

future collaboration. Further, prior ties between firms and individuals such as managers, researchers and common customers also enable the development of trust (Young-Ybarra & Wiersema, 1999). This makes it more likely and easier for entrepreneurs and managers to contact a potential business partner.

Intuition

According to Bierly and Gallagher (2007), intuition is based on experience, training and prior learning. This research shows that, like experienced entrepreneurs, entrepreneurs with little business experience also mentioned intuition as an important factor. According to Barnard (1938) a lot of decisions do not follow a rational analytic process, they rely on intuition through a 'non rational' decision-making process. The entrepreneurs and managers in this study mentioned it sometimes was a feeling of 'just do it', based on feelings of earlier meetings. There is always some uncertainty in the process. However sometimes time pressures does not allow decisions to be made through a long analytic process. Bierly and Gallagher (2007) mentioned that it is difficult for managers to make rapid and effective decisions concerning partner selection when they have access to a limited amount of information. Though, intuition is somewhat different than emotion; Klein (2003) mentioned that skilled managers who made decisions on intuition were effective, but the decisions based on emotion were poor. Intuition can be developed through other means than work life experience, perhaps that upbringing in childhood has an impact on intuition.

Personal chemistry

The personal bond in a relationship is crucial for long-term success. The data showed success and weaknesses of this strong social bond. When one of the involved persons gets another job, this might influence the collaboration. Lorange and Roos (1991) mentioned the importance of a social bond; a strong personal relationship is crucial for collaborative success. The characteristics of individuals involved are important in establishing a relationship. Similarities in personal values lead to a stronger bond that is more likely to overcome changes and issues (Wilson, 1995).

6. Master Thesis contribution

6.1. Theoretical contribution

This master thesis contributes to the literature on new business partner selection with an adapted theoretical model, starting from the very beginning; the recognition of an opportunity by an entrepreneur. **Contrary to existing literature on opportunity recognition it seems that opportunities in high-tech do not suddenly “pop-up” but develop over time, through acquiring knowledge, extensive research and guidance from experts.** Entrepreneurs do this by taking advantage of all opportunity recognition factors, but prior knowledge, social capital and experience tend to have the most influence here. Furthermore, experience ensures that the entrepreneur can connect the dots faster in order to exploit new opportunities.

This research further adds to the literature by proposing two new phases to the initial conceptual model. These phases are “pre-search” and “project”. Pre-search tends to be the beginning point from where future directions of the small firm are determined by entrepreneurs and managers. This therefore can influence the choice of the kind of business partner that is needed. The phase “project” is added because it seems that most of the sustainable collaborations with new business partners in high-tech start with a short term project before entering into a long-term relationship.

Furthermore, the phases mentioned by Emden et al. (2006) are according to this research more nuanced. According to Emden, the phases of technological alignment, strategic alignment and relational alignment are consecutive, independent phases. However, this research shows that the phases are more intertwined. Whereas every case starts with technological alignment, relational alignment flows through the whole process. Therefore relational alignment is not a separate phase but a factor that influences the process at every moment.

The most important factors that influence decisions entrepreneurs and managers make and the associated speed of the decisions were based on relational alignment, trust, commitment, personal chemistry and time-to-market. These factors are present through the whole process and mainly based on individual preferences. While trust, commitment and personal chemistry are known factors, the drivers of the factors found in this study may be new. The individual preferences show that the partner search, find and selection process is not a fixed checklist, but mainly based on qualitative aspects and mutual relationships.

6.2. Practical contribution

This thesis has a couple of practical contributions for entrepreneurs and managers of small high-tech companies regarding the ways of searching, finding and selecting a new business partner. These recommendations arise from empirical research among the interviewed entrepreneurs and managers who have managed a successful collaboration. The recommendations are prioritized below:

1. It is recommended to *start with a clear business strategy*. Although the participants involved knew they needed other partners to eventually commercialize a product, they did not always have a clear overview of their own capabilities and the market. So, gaining market knowledge and understand the own firms capabilities turned out to be a good starting point. So, before you search the internet or visit an exhibition, it is recommended to have an idea of what you want to achieve with a collaboration. This helps to critically look at your own company and what possibly could be done better. Also, defining the type of help your company might need can result in a clearer view on where you want to go with your own company.

2. *Regular contact on a personal basis* can increase trust, commitment and strengthens the relationship between the parties involved in a collaboration. Regular contact can make environmental-, market-, technological- or relational problems easier to overcome. Further, this research shows that a *strong personal bond between key actors in partnering companies* are a key success factor for an efficient and sustainable relationship.
3. *The places to seek new partners are mostly places where you meet face-to-face, such as exhibitions and conferences.* Participants in this research travel around the world to meet other people from their industry at the very few large high-tech exhibitions. These places allow entrepreneurs and managers to efficiently arrange meetings and speak to different kinds of people; commercial and technical skilled people. Furthermore it provides the possibility to stay up-to-date with the latest techniques and developments in the field.
4. It is recommended to *search the potential partners by yourself.* First, managers and entrepreneurs know the firms technologies, products and needs better than anyone else. Second, they save money when they do the search, find and selection themselves. Even if you hire a market research firm, it is wise to spend time on the market to learn and see the market for yourself. Third, they will get more information about potential competitors and end-users of their product.
5. Empirical research has shown that most of the entrepreneurs and managers collaborated with larger firms. The difference in company size can be justifiable as the entrepreneur or manager of the smaller firm shares its technology and the larger firms share their resources, finance, marketing, etc. *Choosing larger companies as a partner* can help commercializing and developing innovations faster. Another advantage of collaborating with a large company is the experience they have with problem dealing. These companies often have gone through most of the problems small high-tech entrepreneurs and managers still have to face. Therefore they can help these entrepreneurs and managers in making the 'next step'. Side note to this advantage is that large companies have a different way of working. Decision processes are often way longer, less flexible and large companies have different organizational structures (formal, hierarchy).
6. This research suggests that *small high-tech firms can have an advantage when the CEO has experience as a (senior) manager* in a large firm. This CEO understands the decision making processes in large firms and knows how to deal with them. A CEO also knows how to present the company and its future plan. Besides that, a manager often has large networks which can open new doors. In small high-tech markets, the networks of entrepreneurs and managers can provide credibility and brand awareness to partners and end-users.

7. Limitations

This research has a couple of limitations that have to be mentioned. The target audience initially consisted of two parties, the seeking entrepreneur or manager and the business partner. The intention was to view the search, find and selection process from both sides. However, due to confidentiality agreements between the involved parties, the business partners were not interviewed. This also made it difficult to examine whether collaborations were successful or unsuccessful, because this was not verifiable. As a result, this study relies largely on the opinion of the interviewees. For the reliability, experience and opinion it would have been better to view the process from both sides.

Great efforts were made to get a homogeneous research sample, however it cannot be denied that the selection of firms was heterogeneous to a certain extent. There was a deviation in the development stages and years of foundation between the firms. One of the characteristics of high-tech firms is their fast growth. Because of this rapid development, many young high-tech companies quickly move over 50 employees. So, to be able to compare the interviews it was important to involve companies up to 50 employees. This made it not entirely preventable to involve firms in different development stages and years of foundation. Although the firms were all defined and recognized as high-tech by being actively engaged in R&D, the use of protective agreements and the requirement of developing new technology-based products in the past 3 years, it was inevitable that the companies were active in different branches. Desirably the research sample should have contained more comparable companies or branches to make a more fair and conclusive comparison.

Furthermore, from an opportunity recognition and partner selection process point of view, during one of the first interviews it became clear that in high-tech different persons are responsible for both processes. We could have decided to interview the person responsible for the opportunity recognition process and the partner selection process independently. But it turned out to be extremely difficult to plan interviews in practice, and in some companies the original founders were already gone. Therefore this was not workable in the timeframe of this research.

Furthermore, openness is also indicated as a driver of trust, but at most company's detailed information such as mutual e-mails, telephone calls from which certain characteristics could be traced, was left behind. In one case no audio recording could be made.

Finally, participants involved were all from the European Union EU, specifically the Netherlands. The economic environment and possible cultural differences might differ among countries, despite the fact that high-tech companies involve a lot of different people, from different countries and different cultures. For future research around this topic it is recommended to keep these limitations in mind and improve them if possible.

8. Conclusion

The starting point of this master thesis was that entrepreneurs experience difficulties with finding new business partners with whom they can develop new innovations in a successful and sustainable collaboration.

The research started with a literature review on the opportunity recognition process and the business partner selection process. Based on this information a conceptual model of the expected process of opportunity recognition, and partner selection phases model of Emden et al (2006), was formed. This theory was tested due to implementing it in the empirical research with entrepreneurs and managers from small high-tech companies. Eventually the findings led to adaptations in the conceptual model, which resulted in a better tuned display of the actual process.

According to the results of this study entrepreneurs of high-tech firms seem to develop opportunities over time instead of “popping-up” as mentioned in existing literature. Entrepreneurs did extensive research, acquired specific knowledge and were guided by experts in their field. Because a lack of resources, knowledge or capital these entrepreneurs have a need to search for a business partner. Because of the small market and required quality they often search outside their familiar 1st grade contacts. In the search for a new business partner they need to have a commercial mindset in order to fulfill investor requirements and they have to be able to develop the company. Additionally, they have to be able to leave their comfort zone and communicate with stakeholders to make them enthusiastic for the product. Participants from this study tend to use desk research on the internet to gather information about the market, their partners and possible competitors. The next step is making contact, the first contacts are mostly established at exhibitions and conferences, because the key persons involved in the partner selection process see each other at these events.

The general conclusion is that it is difficult to find a precise pattern in the steps and decisions entrepreneurs make. The factors trust, commitment and personal bond show that the process is dependent on the people involved in the process and their experiences. Trust, commitment and personal chemistry are not only good for more efficient decisions, but also for the long term relationship (Turnbull, 1979). Entrepreneurs and managers refer to the beginning of the process when they have to make a decision to collaborate with a new business partner. This study shows that when potential partners are close to each other on technical and qualitative performance, the influence factors; trust, commitment, personal bond and relational alignment are decisive. In none of the cases entrepreneurs and managers could predict in advance whether the collaboration would be a success. But the willingness to adapt, thorough preliminary research and the influencing factors mentioned, could increase the successfulness and sustainability. Important is that regular communication of key persons across different levels of both firms takes place at a regular basis. This allows firms to adjust when the planned goals are deviated or when unexpected problems arise.

Based on this study, online and offline search, find and select can complement each other by combining the first phases, search and find, online. Research has shown that people spend a lot of time on these phases and business partners are located in different places around the world. The barrier of time and distance can be removed by implementing a partner process online. A much larger and more extensive selection process can take place before the first contact. As a result the process could be more accelerated. Furthermore, online access ensures unlimited access to a larger amount of potential partners in any place. Through the use of algorithm this process might be further optimized. However, personal contact should never be underestimated. This research showed that personal contact is very important in every phase. It decides whether to go to a next phase. If something is implemented online then chat and video options are recommended to answer questions and get to know each other.

However, there still need to be face-to-face appointments. Because entrepreneurs and managers of small high-tech companies, all indicated that face-to-face contact is important to them. Therefore the online process can be applied in combination with a specific exhibition or conference in order to make it easier to match people.

8.1. Further Research

This research was explorative since no literature is written about the process of entrepreneurs and managers of small high-tech companies, who search, find and select a new business partners. This research provides some practical recommendations for entrepreneurs and managers, however results cannot simply be generalized due to the qualitative nature of the research and the sample size of 15 interviews. To gain more insight in the significance and generalizability of the phases and factors involved, further research is needed.

This research is viewed from the side of a high-tech entrepreneur or manager who seeks a new business partner. It would be interesting to view the process from the other side; from the business partner. This would lead to a more complete insight in the process, motives and reasons to decide to collaborate with a (an often smaller and less experienced) new business partner. As this study took place in the Netherlands and the high-tech companies consist of a very culturally different composition, it might be interesting to know whether entrepreneurs and managers in other countries follow the same steps and use the same characteristics. Then the results of this study might be better generalizable.

Furthermore, prior research showed that trust was an important factor in the entire process. However, in practice it is difficult to measure the concept trust. Further research must prove how much trust and commitment affect each phase in the process and to what extent that process can speed up or slow down. Next to that, this study shows that personal contact is important and will be important in the coming years. However, the current search, find and selection process is very time consuming for entrepreneurs and managers of small high-tech companies. Perhaps the needs and wishes for an online website or app can be examined, for example based on an event where entrepreneurs and managers from a specific high-tech field meet. It should facilitate the first part of the process, search and find through an advanced use of algorithms. The intention is to provide an easier and faster way to gather information and introduce entrepreneurs and managers to each other.

There is no such thing as a fixed scheme with subsequent steps to success. In fact, all entrepreneurs and managers indicated that there is no clear answer to the search, finding and selection of a business partner. It is possible to outline the broad lines. However, this study does not show any detail with exact data and conversations. Because, the process is too complex and dependent on the individuals involved. In addition, the participants indicated that they could not give this information, and that if they could they would not do it. In order to reflect this and to make it more measurable, it might be possible to set out a survey among a larger population in order to see whether the qualitatively proven corresponds to quantitative data.

9. References

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Appendices

Appendix 1: Interview Protocol semi-structured interview

Interviewee:

Company:

Interviewer:

Date:

Start time:

Requirements:

Interview Introduction

First of all, thank you for your willingness to participate in this interview. In the coming period, the University of Twente is working on a research regarding how entrepreneurs of small high-tech companies search, find and select a new business partner in order to develop a successful, sustainable relationship.

This research describes which search, find and selection processes entrepreneurs from existing small companies in the high-tech industry go through until they make the decision to enter into a sustainable partnership with a new business partner. Additionally, we are interested in how this collaboration progresses, and to what extent the decision has been successful. You are one of the cases that is being investigated, through an interview. The results are compared in order to understand how entrepreneurs in the high-tech industry search, find and select business partners who do not know each other beforehand. These insights will be used for scientific research. The aim is to establish a list of recommendations about the ways of contacting and the steps to take in order to make this process more efficient, the ultimate goal is to promote innovation. The best practices are shared with you and the results will be processed anonymously. Important to mention is that there are no good or bad answers, your story is important for the research.

During the interview the following topics will be discussed:

- Questions about your company and your background.
- Questions about your technological innovation.
- The most important constructs are explained (as stated on the hand-out).
- Questions about your search, find and selection process.

The insights from this interview are used for scientific research. With your permission an audio recording will be made during the interview. The recordings are kept safe and used exclusively for the elaboration of the interview, after the transcription of the interview the audio records will be destroyed. Further your answers will be treated confidentially.

Do you have any questions or remarks before we start the interview?

Most important constructs

Conceptual model

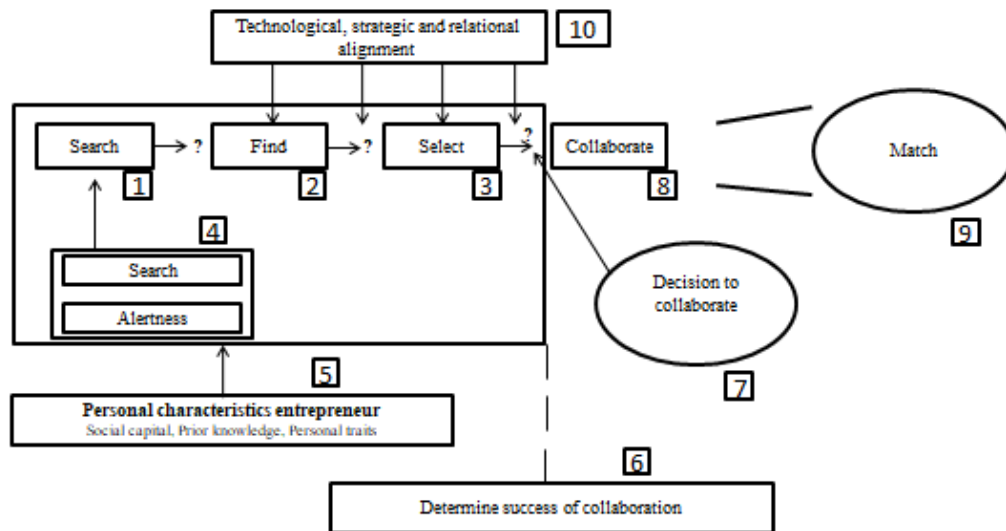


Figure 5. Conceptual model about the search, find and selection process for a sustainable relationship with a business partner in the high-tech industry, the conceptual model is based on the literature and developed by the researcher.

Short explanation model

Systematic Search and Alertness (systematic search and alertness) (4) are important concepts in recognizing opportunities by entrepreneurs. Alertness emphasizes the fact that opportunities can be recognized by individuals who are not actively looking for opportunities, but who have a unique willingness to recognize them when they appear. They are not involved in a formal, systematic search process.

In their search for a suitable business partner, entrepreneurs go through various processes (1,2,3,7,8) before there is a sustainable collaboration (9). In this research we are interested in how these processes work, how entrepreneurs make decisions, why, when and what effects this has when this business partner was previously unknown. This research is done with entrepreneurs and it is expected that his or her systematic search, alertness (4) and characteristics (5) influence the search, find and selection process.

Search - search: The search process is considered as a way of deliberate learning. It is also being done to obtain information about the potential business partners that can influence the later choice for a business partner. To do this, often search criteria are drawn up.

Find - finding: Finding a business partner does not mean that a collaboration is being set up right away. A party may have contact with various other parties before they start a collaboration. In this phase the potential partners meet the requirements but a more refined selection must be made, a shortlist.

Select - select: Select the most suitable partner. This partner meets the requirements. Emden et al., (2006) described three phases that ultimately lead to the partner with the most potential for synergistic value. In this phase the partner with whom a successful, sustainable relationship is established will be selected.

Collaborate – Collaboration is defined as: “*any activity where two or more partners contribute differential resources and know – how to agreed complementary aims* “(Dodgson in Leenders & Gabbay, 2013, p.358).

Match - fit together: A match is an abstract concept. A match is understood; A long-term collaboration (more than six months), in which the predetermined goals (quantitative or qualitative) with the well-being of both parties have been achieved. A sustainable collaboration is a two-dimensional construct that includes relationship quality as relationship stability.

Emergent theory of partner selection of Emden, Calantone & Droge (2006)

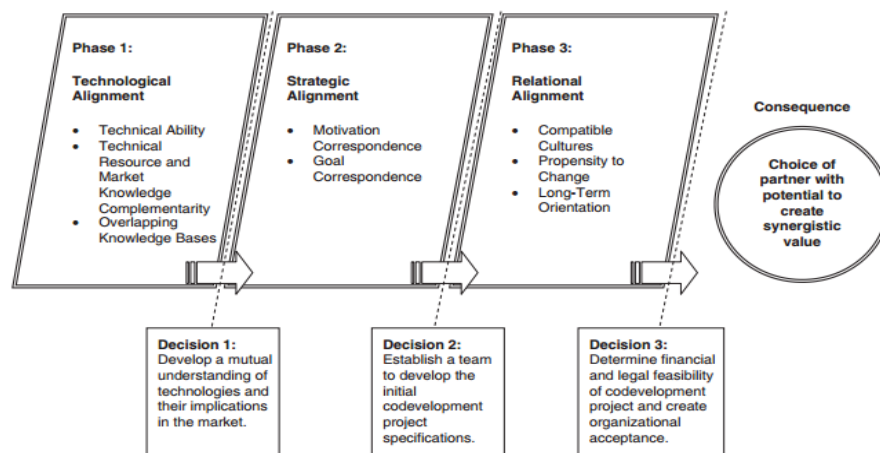


Figure 1. Emergent Theory of Partner Selection for Creating Product Advantage through Collaboration

Figure 6. Emergent theory of partner selection with potential to create synergistic value (Emden, Calantone & Droge, 2006)

Short explanation model

In the above model, you can see the phases (technological alignment, strategic alignment and relational alignment) that managers, according to the research conducted by Emden et al., (2006) go through when they select a business partner with maximum potential for synergistic value. The first phase is characterized by the presence of technical capacity, resource complementarity and overlapping knowledge base. Strategy is the next phase and is defined as the goals of an organization and the way they want to achieve them (Saint-Onge, 1996). The two emerging subcategories in this phase are (1) motivation correspondence and (2) goal correspondence. The final phase of the partner selection process shows that it is relational. Three subcategories are (1) consistent cultures; (2) propensity to change; and (3) long-term orientation.

Company details

Company details

Company size:

Founding year:

Industry:

Products:

Information interviewee

Age:

Gender: M/F

Profession:

Training (5):

Career (5):

Describe in short (max 2 min) who you are and why you do the work you do (5):

What is it you do in high-tech:

How long did the successful collaboration take:

How long did the unsuccessful collaboration take:

Interview questions

1. Please, briefly explain (2 minutes) how the entire successful process with a new business partner went from search to match.
2. What is most important to you concerning a collaboration and your technology?

Search

1. What was the reason to search a new business partner outside your own network?
2. How long did the first phase (search and find) take? If it has taken a long time, what did you do in the meantime? When (exact date) did you have the first contact, how and where did you have the first contact? (E.g. personal / email / telephone) What was the conversation about per contact moment?
3. What kind of business partner were you searching for? Could you give some examples? (small / large / more experienced / new technology / possession of important data / skills)
4. What knowledge about your business partner did you have at the time you searched for or found your current business partner?

Find

1. What information about your company did you share with the other party at the time you found them? Why this specific information?
2. How did you know that the techniques of both companies could complement each other? And how did you know that this other party might also be interested in a collaboration?
3. How did you come from finding to selecting a business partner?

Select

1. What information about your company did you share with the other party at the time you selected it? Why this specific information?
2. How many companies did you speak to before selecting your current business partner? Why did you not enter into a collaboration with the other companies?
3. Do you use the same search, find and selection strategy for every collaboration or does it change?

(Decision to) collaborate

1. At a certain moment you have decided to enter into a collaboration. When in the process and how did you decide to start working together? How do you determine future success?

Match

1. Why do you consider the collaboration as a success? How did you measure "successes"? Can you give examples?
2. Why do you think collaboration has become successful?
3. How did the culture and values of both companies contributed to the success of the collaboration?
4. Did the entire process went as planned or were there any issues that you have underestimated?
5. Which persons are involved in the phases search, find and select? What were their roles?
6. What were on fore hand reasons to stop the collaboration?

Personal characteristics

1. How did your involvement in the search, find and selection process contribute to the success of the collaboration?

Search & Alertness

1. How did you conceive the current core technologies? (4)

Last question

1. What question did you expect and has not been asked?

Thank you for your cooperation in this research. Am I allowed to contact you by telephone or email when additional information is required?

Answer: Yes / No

Email:

Telephone:

Appendix 2: Codes

Table 1: List of codes

New model			
Core category	Category	Code	Description codes
	Characteristics	Entrepreneur characteristics	Innovative curiosity, creating new technology products
			Risk taking by developing something new, long road to earnings
			Initiative and creativity, being the first to develop something new
			Independence personally and with the company.
			Dare to release technology
			High role ambiguity
			Solving technical challenges
			open-mindedness, imagination
		Managerial characteristics	Good in networking, social development, communicate easily
			Enthusiasm potential partners and end users for technology
			High interest in organizations and people
			Technically skilled, general understanding technology
			(Complex organisation) working experience
			Managerial challenges (deal with investments, return on investment)
			Decisive / dare to make economically risky decisions
Research model and subsequent steps	Phases	Opportunity recognition	Prior knowledge
			Experience of the entrepreneur
			social capital
		Pre-search	Formulate own company capabilities, gaining market knowledge
		Search	Technological Alignment + long list
		Find	Technological Alignment + short list
		Select	Strategic Alignment
		Decision to collaborate	Trust, commitment, personal chemistry and alignments phases
		Project	Working together with all the stress and payment problems, uncertainty, intern organizational acceptance
		Match	Open agenda, recognize future value, regular meetings, new projects
	Influencing factors	Relational alignment	Propensity to change and Long term orientation
		Trust	Social networks
			Reputation
			Cultural and organisational similarities
			Individual propensity to trust based on early life working experience
			openness
			Intuition

		Commitment	Efforts outside office hours
			showed interest / eagerness
			Involvement of skilled employees
		Personal chemistry	Personal bond
		Time - to - market	Readyness of the market
			Compatibility of both parties
			Time pressure

Appendix 3: Assessment of opportunity recognition

Table 2: Assessment of opportunity recognition

Participant	Quotes
Anonymous 1	The idea is from (.....) CTO, he studies (.....) at the University of Twente and did a lot of research into the concept of resonance in the past and when he came into contact with companies and province in a joint research project, the idea arose of curiosity, what can I do with resonance? So he actually came to the idea through knowledge and experience.
Anonymous 2	We have developed a scanner and software applications by means of a lot of research and knowledge. We are continuously working on expanding the number of applications of that scanner. Usually we design our technology from a demand from the market because the principles remain fairly the same, we can also apply the techniques in different branches.
Anonymous 3	Most people here all have a PHD and they graduate in a certain direction. Like (.....) our CTO and they are always looking for a new challenge, (.....) is also a graduate in photonics and that's where it started. (.....) started his working career as the chief architect of the software, which translated the design requirements needed by the a design group into software solutions, later he introduced the concept, which nowadays is the standard design approach in integrated photonics mask layout and modelling. Also keep in mind that the people who come up with this already think what we need over 30 years. You do not just come up with this, you have to be very smart and have done a lot of research into it.
Anonymous 4	I have had technical positions; I have been responsible for production departments and engineering departments. I have been a commercial agent, have gained a lot of experience over the years but have not worked anywhere for a long time. I like challenges and when the goals are achieved I am ready for another challenge. I have a fairly broad knowledge through my education at the University Medical Electrical Engineering and what I often do is I use solutions from other disciplines for the field in question. I see the world as things that are all the same, while in fact they are different. That's how I recognize opportunities and start building new medical devices.
Anonymous 5	Our COO has done his doctoral research into micro-encapsulation, what in simple terms means packing small particles. This is a process where drops with between 1 and 1000 micrometers are enclosed with a kind of protective layer.
Anonymous 6	(.....) graduated on (.....) an immediately wondered if it could be possible to do more with (.....) than just a PhD. (.....) has a background in aerodynamics but is also very good in sales and making people enthusiasm in the technology and the functioning of such a product. He bought the technology and further developed the product with his knowledge and experience.
Anonymous 7	Few architects do fundamental research on, for example, high-rise construction or insulation. Then I thought what is the challenge at the moment? it is the cooling of buildings. I learned at school that the warmth of buildings goes almost automatically, but the cooling of buildings is actually much more complicated. With that background, I spent a day a week researching the cooling of buildings in literature research. Then I came across the technique of (.....) CTO because I had discovered; what is the problem, when it is hot outside you want it cold inside and at the moment it is cold outside you want it warm inside, it seems like you have a half-year shift in supply and

	demand.
Anonymous 8	Promoted at the University on a certain way of how to make uniform microbubbles, a very nice technique which I have found through the study and help of scientists, but after that I wanted to know if I could do anything with it commercially. Then I first worked for a Pharmaceutical firm, in order to get a feeling for what practical problems there are and whether there is a need for a new technique with which they can make uniform bubbles. That need seemed to be there, by just talking to a lot of people.
Anonymous 9	When there are issues in electronics and software, you are looking for the components that you think you need, which is craftsmanship through research and experience. You can link techniques through experience and knowledge. You should know that most people who work here have a PhD or a master like me. Years of research precede before you come to a novel technology.
Anonymous 10	Simulating friction is a line of research at the UT, where much research is done. This research is often financed and driven by the industry, but there was never a commercial solution. We have built a commercial product around it. That sounds very simple but as we look back on it, it is actually a very complex idea. We went to the core, what really are the pain points of the industry, make it easy to apply for the industry and make it easily available for the industry.
Anonymous 11	After my bachelor I thought, there is more, because I could not really appoint certain subjects. The PhD study is the perfect opportunity to do that. It had to fit in with my interests; the biomedical side and also a study that can offer an opportunity to set up a company. I found that and the research appealed to me and gave me a lot of freedom to develop something and what we would then develop could immediately find an application in a medical setting. Of course with the advice of lecturers at the University.
Anonymous 12	During the PhD research we tried to edit surfaces or molds to make it self-cleaning. The industry was very interested in this technology. There was interest from companies to develop something new together. In the last year of the PhD project I actually did assignments for companies that wanted something with this technology and we were the only ones in the Netherlands that had that, so we complete assignments for them.
Anonymous 13	(.....) is responsible for the laboratory, chemically also the smartest, he has a PhD at the University here in Twente and therefore has a lot of knowledge about chemicals. We come up with new solutions every year, because you can keep in mind that the recipe can sometimes consist of 2 to 13 raw materials to have the right effect. So you can combine different raw materials with each other to create a new product.
Anonymous 14	The founders come from the University and have gained a lot of experience in IT, through the experience and knowledge they have seen the opportunity to build software in order to organize business processes. It is something that was not that well developed in the early years. We still do that now but then on a tailor-made basis.
Anonymous 15	We already did (.....), so high voltage level and (.....) had an idea with the TU (.....) and it is a small world. So, we started thinking about that and trying it, because it was also a challenge for us. The old owners, through their experiences and knowledge in the field, have seen certain points of recognition through which they could develop such a product.