The entrepreneur in the cluster

- a qualitative study of how cluster environments support the identification and development of new business ideas
Abstract
Entrepreneurship has become an important issue in the modern society where the business landscape consists of many small and medium sized firms. These firms have all been started by an entrepreneur who has identified and business idea and developed that idea into a new venture. We therefore see the idea identification and idea development process as a central part of the creation of a new firm.

A concept that has become popular in the discussion about entrepreneurship is the cluster concept and dynamic business settings. These concepts are based on the fact that in some geographical regions more firms are started than in other geographical locations. These firms are often started in the same field or industry which has lead to theories that the environment supports and stimulates entrepreneurship. The studies about clusters have often been conducted with an organizational perspective and studied formal contacts within clusters. Therefore we in this study want to study how cluster environments support entrepreneurs in their idea identification and idea development process with the perspective of the individual entrepreneur.

The study is based on a theoretical framework built around the cluster theories develop by Michael Porter who is considered to be the father to this concept. In addition to this we also present theories about the importance of untraded interdependencies, the triple helix, spin-offs and entrepreneurs as organizational products.

The empirical material for this study has been collected through interviews with five entrepreneurs in Sweden’s famous ICT cluster Kista Science City just outside Stockholm. These interviews are later presented as five individual cases which describe the idea identification and development process. The results from these interview shows that the cluster environment can support the entrepreneurs in several ways. The support we have found in this study could be linked to the existence of untraded interdependencies that provided the entrepreneurs with access to information, knowledge and experts through networks. These factors were useful both in the idea identification and the idea development process.
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1 Introduction
In the introduction we present the background to our research problem and the objectives with the study. We also describe the information and technology cluster Kista Science City where the empirical data to this study has been collected.

1.1 Problem background
Entrepreneurs and entrepreneurship has become an important part of every modern society today with the implication that government today actively work to improve the preconditions for entrepreneurship.\(^1\) Sweden is no exception as we have organizations such as NUTEK, VINNOVA, and ALMI that works in order to support entrepreneurial activity, added to this can be the governmental agencies in the municipalities. The state and the industry also work in joint projects in order to support research and entrepreneurship which might lead to new firms. The Swedish framework for development and economic growth have through the history had a big firm’s perspective with the basic idea that it is the big firms that leads the growth and development of the economy. It can however be concluded that it has been a change in this perspective lately. The importance of small-firms (SMEs) for the economic development has been widely recognized as the SMEs makes up a big part of the economy.\(^2\) Politicians and policymakers have therefore shifted much of their attention regarding development and growth from the big firms towards the SMEs\(^3\). Much of the attention has been focused on how the motivation to undertake entrepreneurial activities can be increased among the Swedish population as Sweden has a low level of entrepreneurship\(^4\). The most known form of undertaking entrepreneurial activities is the creation of a new-firm which is the outcome of the identification of a business idea. We therefore argue that the identification of business ideas is the central part in all creation of new firms.

In some regions more firms are created than in other which indicates that idea development might be easier there. One relative new concept that has been emerging in the entrepreneurial discussion is the concept about dynamic business settings that is regions or geographical areas that have more innovation and growth than other regions\(^5\). The concept of dynamic business settings are built upon that location and proximity are important factors that contribute to the productivity and development of firms. There are several different dynamic business settings with different characteristics such as clusters, industrial districts and regions of innovation. The Cluster concept is probably the most famous concept of a dynamic business setting.\(^6\) The theory was formed by Michael Porter who provides us with a definition: “Cluster are geographic concentrations of interconnected companies and institutions in a particular field”\(^7\). Porter states that dynamic business settings in form of clusters not is anything new but

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\(^1\) Nutek, ”Ett starkt entreprenörskap policykrift om nya perspektiv, ändrade förutsättningar och positiva attityder.” Stockholm, Get AB, 2003
\(^3\) Christian Longhi and David Keeble, “High-Technology Clusters and evolutionary trends in the 1990s” in High technology clusters, networking and collective learning in Europe, eds. David Keeble and Frank Wilkinson (Aldershot: Ashgate, 2000), 199-229
\(^4\) Jonas Frycklund, Lågt nyföretagande i Sverige, 2007-01-23, Svenskt Näringsliv
that it always has been economic regions with more growth and innovations. He further claims that it in clusters is easier to see opportunities, which then lead to ideas.\textsuperscript{8} This is something that the politicians have noticed the last years as they have tried to create favorable policies for existing clusters in order to create more innovation which can lead to more jobs and tax incomes.\textsuperscript{9} It is possible to find a number of clusters in Sweden such as the furniture cluster in Småland, the biotechnology cluster in Uppsala\textsuperscript{10}, the Biofuelregion in Örnsköldsvik or the car testing cluster in Arvidsjaur\textsuperscript{11}. The most famous and prosperous cluster in Sweden has been the IT and telecommunication cluster in Kista. The geographical area of Kista Science City have around 1400 firms and 30 000 employees\textsuperscript{12} and has further been ranked as one of the most dynamic and innovative IT and telecom clusters in the world\textsuperscript{13}.

A cluster is supposed to increase the competition which leads to a higher productivity, innovation and finally more new start-up firms. This is a result of that a cluster offers a high access to employees, suppliers and higher information flow between individuals and firms. Flow of information gives the entrepreneurs a better insight into market needs which gives the entrepreneurs better possibilities to come up with new innovative ideas to meet them quicker than outside a cluster. Important factors are also specialized infrastructure, good access to public goods and institutions and finally closeness to investors.\textsuperscript{14} Many of these factors can be found in Kista Science City as they have specialized infrastructure, good access to public goods in the royal institute of technology KTH that further is a source to highly educated employees. It is further possible to find investors in the area.\textsuperscript{15}

One basic assumption concerning clusters is that they contribute with more new firms than other geographical areas. This indicates that the entrepreneurial process of identifying and developing business opportunities is easier in a cluster environment. An explanation of this is that a cluster is characterized by high movement of people between organizations; the people working in these areas have access to a lot of information and networks which can lead to more ideas.\textsuperscript{16} It is believed that informal contacts and knowledge flows between individuals and firms are important for innovation and entrepreneurship.\textsuperscript{17} This is in line with other findings which suggest that prior knowledge about market conditions and customer needs, which the entrepreneur learns in other organizations, triggers the entrepreneurial process.\textsuperscript{18} It is further argued that a cluster provides a supportive environment for entrepreneurs as the cluster network provides the entrepreneur with better financial support and access to skilled

\textsuperscript{8} Nils-Olof Ollevik, ”Politiker kan inte skapa cluster, hävdar klustrens egen ”pappa””. E24 Näringsliv. 2008-01-28
\textsuperscript{9} ISA. Nutek. & VINNOVA. Att växa tillsammans ett samarbete mellan ISA Nutek och VINNOVA. Nutek Förlag 2005
\textsuperscript{10} Lindqvist, Göran et al. Svenska kluster kartor. En statisk inventering av kluster i Sverige
\textsuperscript{12} http://www.kista.com/sv/article/foretag_i_kista_science_city, 2008-04-16
\textsuperscript{14} Porter, ”Cluster and the new economics of competition.”
\textsuperscript{15} http://www.provins.se/kista.com/KSC_VB04-06_webb.pdf, 2008-05-26
\textsuperscript{16} Dominic Power and Mats Lundmark, “”Working through Knowledge Pools: Labour Market Dynamics, the Transference of Knowledge and Ideas, and Industrial Clusters,” Urban Studies, Vol. 41, (2004), 1025–1044
\textsuperscript{17} Porter,. ”Cluster and the new economics of competition.”
\textsuperscript{18} Shane Scott, “Prior knowledge and the discovery of entrepreneurial opportunities”, Organization Science, Vol.11, No. 4, (2000)
employees. This is in total supposed to lower the barriers to entry on the market for new individual entrepreneurs that are trying to develop their ideas into new businesses. It has however been questioned whether proximity and location really are important factors for innovation and entrepreneurial activity in geographical regions such as cluster. It has been concluded that firms in some areas, even if they were located close to each other, interacted more with firms located outside of the cluster area with the implication that the main sources for new ideas and innovation originated outside the cluster. These studies have nevertheless just been considering the formal contacts within the studied areas and not the informal. Informal contacts between firms have been studied and it has been concluded that informal contacts are something that exists and is important for firms in cluster environments. This has contributed to increase the understanding about cluster environments and it is today assumed that location and proximity do matter as important factors for the development of firms.

The research concerning cluster environments has shown that cluster environments can give firms advantageous as well as it has shown that more new firms are created in cluster areas compared with other areas. It can therefore be assumed that cluster environments offer entrepreneurs better possibilities to identify and develop business ideas. However most of the research done concerning clusters has been with a focus on connections and links between the different organizational actors in clusters such as institutions, firms, governmental organizations and universities which gives them an organizational perspective. That is they have not been focused on the individual entrepreneurs, which makes it hard to know how entrepreneurs that acts in cluster environments consider that the environment have helped them in their entrepreneurial activities. This despite the fact that individual entrepreneurs are factors that drive clusters development forward as they start new firms. New firms are based on a business idea that is identified by individuals. It is further individual entrepreneurs that continues and carries on the development of the business idea throughout the process that can lead to the creation of a new venture. That is to say entrepreneurial activities in form of new venture creations would not take place without individual entrepreneurs. We argue that it thereby is individual entrepreneurs that are supported by the cluster environment in the creation of new firms.

We therefore argue that it is necessary to turn the attention towards the individual entrepreneur in the cluster environment. We believe that a focus on the individual entrepreneur in a cluster environment can give us a better insight about how the entrepreneurs experiences that the cluster environment support him/her during the process to identify and develop business opportunities. We can through a focus on the individual entrepreneur approach the reality throughout the eyes of the entrepreneur. This can give us a better understanding about the reality as we through the eyes of the entrepreneurs can study the cluster environment from the inside instead as has been done before from the outside.

19 Porter, “Cluster and the new economics of competition.”
22 See for example Porter and Keeble
1.2 Research Problem
How do cluster environments support individual entrepreneurs in the process to identify and develop business ideas?

1.3 Research Objectives
The main research objective with the study is to understand how cluster environments help entrepreneurs to identify and develop business ideas into new firms. The ambition is to gain insights and knowledge that can contribute in the creation of a general understanding about how individual entrepreneurs perceive a cluster environment as a beneficial area to start up a new venture.

The different activities that take place during the process to identify and develop business ideas will be analyzed based on a theoretical framework of cluster theories for dynamic business settings. The aim with the analysis will be to see what kind of impact cluster environments have on the individual entrepreneurs during this process. This will be done by studying entrepreneurs that have started a firm within the ICT sector in Kista Science City. The intention is to contribute with results that can be useful for policy makers, future entrepreneurs and academics in order to better understand entrepreneurial activities in cluster environments.

1.4 Kista Science City
Kista Science City is a world known ICT cluster located outside of the center of Stockholm in the metropolitan area of Kista. Kista is located just 20 minutes away from Stockholm City and can therefore offer good communications. The number of ICT companies in the region is constantly growing and compared to other sectors it is growing with a higher pace. Today there are 520 ICT companies in Kista Science City with almost 30 000 employees. Only the last three years over 100 companies within the sector has emerged. The growth within the ICT sector has been a lot higher than in other sectors in the region. Expressions that have been used to characterize Kista are Europe’s Silicon Valley and Wireless Valley which can show the attention Kista have been given internationally. The cluster has for example been ranked as the second strongest ICT cluster after Silicon Valley in USA.

1.4.1 Background to Kista Science City
The planning of Kista as an industrial area took off in the 1960’s when the Stockholm region wanted to use an old military exercise field for industry, with surrounding housing areas and shopping. The politicians wanted to create a new town close to the Arlanda airport with both workplaces and residents for the workers. To lower the cost they placed it outside the city center with separate areas for houses and industry facilities. During the 1970’s a lot of houses were built because of high demand on apartments in the Stockholm region. At this time the politicians had no intention on creating a cluster, it did not matter what type of industry that

26 http://www.kista.com/sv/article/foretag_i_kista_science_city, 2008-04-16
27 http://www.kista.com/article/ksc_tillvaxtbarometer, 2008-04-17
28 Anttiroiko, “Science Cities: their characteristics and future challenges.”
wanted to establish there as long as it did not cause any environmental problems for the residents in the area. In the 70’s the first IT companies moved into the area with IBM in front. Lower cost compared to more central location was then a strong argument to move here. Another important argument was also that the royal institute of technology decided to establish in the area to provide skilled workers for the companies. The real development for Kista as an IT region took place during the 90’s when the telecom industry boosted and all the large companies within the sector was placed in the region with Ericsson as the locomotive.

A change in the business landscape in Kista took place in the beginning of this century. Two main reasons can be related to this change and it was first the IT-crash in 2001 and the downsizings that took place in Ericsson during this time. The office spaces in Kista had before this been full with high rents as a result that made it hard for firms to move in to the area. The downsizings in Ericsson however left many office spaces empty, the rents went down and new firms started to populate the area. The firms that moved in added new dimension to Kista’s business landscape which increased the diversity of firms in Kista. Kista today have a profile more characterized by small innovative and knowledge based firms compared to before where the landscape was dominated by big companies.

1.5 Kista Science City AB and STING
Kista Science City AB was founded as an organization in 2001. It is a joint project between the companies in Kista, the university in form of the Royal Institute of Technology and the municipality of Stockholm. The ambition is to create a world leading ICT cluster with a modern look. A sign of this is the construction of Kista Science Tower which is a 32 storage high building that with its glass offices, corporate services is a dominating landmark for Kista Science City. The shopping mall of Kista has further been rebuilt to offer more shops, a new food court with restaurants as well as meeting places. The geographical area of Kista Science City has finally been extended with new close related areas such as Husby, Akalla and Sollentuna. This has been done with the intention to prevent that the lack of office spaces will strangle the development in Kista. It is finally important to mention that Kista Science City is the name of both the ICT cluster in Kista and the organization that represent the cluster. After this we will refer to the ICT cluster in Kista when we use Kista Science City and not to the organization that coordinates the activities. It can further be said that it is STING that is the important organization for entrepreneurial activities in Kista.

Another issue regarding the development of Kista Science City was the creation of new firms in the area. The foundation of new firms was limited and the ambition from Kista Science City AB was to change this. Stockholm innovation and growth (STING) was therefore founded in 2002. STING is an incubator with the objective to promote the creation of new firms in Kista and Stockholm. STING offer new innovative technology firms office spaces, counseling and other services related to the start up of new innovative technology firms. STING was further extended with a new organization in STING capital in 2005. STING capital offers entrepreneurs a new service in venture capital or advantageous loans.

\[29 \text{Bienkowska D., Hedberg C.,} \text{ Arbetskraftens rörlighet och kunskapsspridning i kluster: Exemplet IT- och telekomföretag i Kista,} \text{ Uppsala: Uppsala universitet, 2006}\]
\[30 \text{Ibid.}\]
\[31 \text{Ibid.}\]
\[32 \text{http://www.provins.se/kista.com/KSC_VB04-06_webb.pdf, 2008-05-26}\]
\[33 \text{http://www.stockholminnovation.com/sv//article/finansiering , 2008-05-26}\]
2 Scientific method

In the theoretical method we go through our choice of topic and what preconception we had when we began this study. We further argue for our choice of research method and selection of theories and sources. We finally discuss our epistemological standpoint and the transferability of this study.

2.1 Choice of subject

The choice of subject comes from our mutual interest in entrepreneurship and new business creations. We have a strong believe that Sweden is in need of more entrepreneurs in the future and that many of these will start their companies within existing cluster. Since the business landscape is turning toward a characteristic of many small service orientated companies it is not unreasonable to believe that one or both of us will have an own company in the future. Therefore it is interesting to study they who already have taken the step to become entrepreneurs.

During our core courses on the Master program in Entrepreneurship we had the chance to develop our knowledge about things that drives the entrepreneur both on the individual and on a more environmental level and about different regional settings that can flourish entrepreneurial activities. Our interest in cluster theories became bigger when we read more about them. We further did a case work about clusters during the course Dynamic Business Settings in Örnsköldsvik which also provided some interesting reflections about clusters and the theories behind them. We finally got the possibility to participate in Venture Cup in collaboration with local researchers during the program. This gave us the chance to see that new firms often start with just one individual with an idea and an ambition to commercialize it.

The link between individuals and clusters we see as a natural and interesting connection to study because we believe that the core of entrepreneurship is the persons behind the companies. It will be of great interest for us to go out and meet the persons who have taken the opportunity and realized their ideas into new ventures. This study gives us the chance to test if the knowledge we have gained during our studies are applicable out in the “real life” environment of a cluster.

2.2 Preconceptions

2.2.1 Theoretical preconceptions

Our theoretical preconceptions are mainly related to our studies at the Umeå School of Business (USBE) where we have been able to gain a theoretical background that makes us ready to approach the subject of the thesis. Martin is for the moment studying his final year at the program for Business Administration and Economics at USBE. It can also be worth to mention that Martin have been studying one semester in Spain, Seville and the University of Seville where he took two courses about Entrepreneurship in Innovacion y Cambio and Creacion de Empresas, that is he has a theoretical framework of studies of Entrepreneurship from another University as well.

Thomas has a bachelor degree in social science with a major in business administration and is currently attending the Master Program in Entrepreneurship. The focus of Thomas previous studies has however been towards the field of restaurant business. The first three years at the university he spent at Restauranghögskolan and is now on his second year at USBE.
The main field of our business studies is Entrepreneurship. The courses that have been most important for our theoretical knowledge about entrepreneurship are the courses we took when we attended the Master Program in Entrepreneurship during the autumn semester of 2007. The Master Program in Entrepreneurship consists of the following courses: Innovation in Changing Businesses Environment, Dynamic Business Settings, Entrepreneurial Activity and Entrepreneurial Method and Design. It can be said that all the four courses have been of great importance for our knowledge about Entrepreneurship and they thereby gives us a good framework for the thesis. The course Dynamic Business Settings was however of extreme importance as it offers the theoretical framework about dynamic business settings and clusters that is necessary for the study.

2.2.1 General preconceptions
Martins general preconceptions can be related to Stockholm and the Kista area as his father are living in Akalla only two metro stations away from Kista. Martin has due to this been passing Kista with the metro more times than he can remember and he has further on a regular basis been visiting the Kista shopping mall. He has therefore been able to observe the development in Kista Science City as a contemplator from the outside. He is with other words very familiar with Kista and its surrounding areas without that he has had any kind of formal contact with the area. It is possible that the study can be affected by the fact that many people in Martins proximity have been talking about Kista in both positive and negative expressions. Many people living in the proximity of Kista have for example a negative attitude to the area as it have been defined as a segregated area as the business part of the area is not integrated with the part where people lives. The implication of this has been that very few people that work in Kista actually lives there while many of the people that live in the area are unemployed.

Thomas has no previous experiences from the Kista area or the IT and telecom industry. The “real life experience” he has from entrepreneurship is his work experience within small owner lead companies. The close contact with the entrepreneur has given him some insights into the problems that small firms stands before when it comes to monetary issues, employment of competent staff and access to new inspirational inputs. These experiences may affect the beliefs about the companies and entrepreneurs we study in the thesis.

It can finally be concluded that we together have a positive view on entrepreneurship and the creation of new firms which can be illustrated by that we have been studying the master program in entrepreneurship. We can both in the future very well imagine us to start our own firms in a yet unknown field. Our attitudes towards clusters are a bit divided as we have studied clusters as a subject in at the University which we found interesting. But it can at the same time be said that we lack practical experiences of cluster environments a part from the case study that we made in the Biofuel region in Örnsköldsvik during the autumn. We therefore feel that it is hard to have any real opinions about clusters as we need more practical experiences.

2.3 Scientific approach
We started this thesis work with a vague idea of which field and topic we wanted to explore in the study. To clarify the idea we went through what we had learnt during the course dynamic business settings. This was further complemented with a more detailed literature study of what had been done previously in the field of entrepreneurship, clusters and dynamic business
environments. By doing this we were able to deepen and refresh our knowledge and insights in the field and find the limitation to the problem we wanted to study. With a selection of the theories that we saw as relevant to the problem we built a theoretical framework. This framework later guided us in the gathering of empirical information during the interviews with the entrepreneurs in Kista. The empirical data was then analyzed on the bases of the theoretical framework. This study has therefore been done with a deductive approach since we start with theories and apply them on the reality.\footnote{Alan Bryman and Emma Bell, \textit{Företagsekonomiska forskningsmetoder}, (Malmö: Liber ekonomi, 2005), 23}

Even if the process might seem linear we constantly have gone back to previous parts along the way, refining the problem and the theory framework. This has been done when we have felt a need of clarification to better express the problem to the reader and to be able to do the best analyze possible of the studied problem. Therefore our approach, besides to be deductive, is best explained to be spiral. This approach is described by Berg to be a process where the researcher for every two steps forward takes on step back and reflects over the previous parts.\footnote{Bruce L. Berg, \textit{Qualitative Research Methods}, (Boston: Pearson, 2004), 18-19} In this way we feel we can provide the most accurate picture of the problem.

\section*{2.4 Perspective of the study}
Entrepreneurship is all about people, it is people that start businesses and it is people that together form a dynamic business setting in form of a cluster. We have therefore chosen to approach our study with an individual entrepreneurial perspective. That is we want to see and investigate Kista Science City from the point of view of the individual entrepreneur. The choice of perspective is important as it defines how we want our readers to approach and interpret the study\footnote{Halvorson, Knut: \textit{Samhällsvetenskaplig metod}, (Lund: Studentlitteratur, 1992), 37}. We believe that our perspective is important as most earlier studies have been approaching cluster environments with a macro or firm perspective with the implications that the most knowledge in the area that have been documented concerns a clusters contribution to a country’s economy or the contribution to a firm’s innovation. We believe that a perspective of the individual entrepreneur can contribute with valuable knowledge in the research area of dynamic business settings as we will highlight how the entrepreneurs as individuals perceive and benefit from the cluster dynamics.

\section*{2.5 Research method}
To reach our purpose for this study and increase the understanding of how cluster environments support entrepreneurs to identify and develop business ideas, we have used a qualitative research method. In order to get the focus on the individual level we need to use a method that puts the entrepreneur in focus and not just focus on the aggregate level as quantitative methods do. Quantitative methods are better to use when the purpose is to measure different phenomenon in numbers and to find differences between groups. An important argument for us not to use a quantitative method is that it does not consider that people live in social environments which will affect their perceptions.\footnote{Bryman and Bell, 89, 105} Entrepreneurs are human beings who do not act in the same way as the objects studied in nature science because people put social meanings to the environment they live in.\footnote{Ibid., 312}

Since we are studying how cluster environments support entrepreneurs in the idea development it is more useful for us to use a qualitative method that considers these factors.
With qualitative interviews we can let the respondents express what they have considered to be the most important factors in their idea development and start-up of the firm. Because the research done previously has been done with an organizational focus, these expressions have not been given much space previously. We can also interpret their stories of the process and discover factors that cannot be measured in numbers and we can also create a deeper understanding of how the respondents feel about the environment. It is also possible that we by using a qualitative method can discover factors that we had not considered before doing the interviews.

By creating the theoretical framework before interviewing the respondents we can benefit from previous research done in the area by developing a deeper knowledge of the cluster environment. However, we also suffer the risk of becoming too structured and being struck by tunnel vision in our interviews and risk to miss important facts. Structure is something that some researcher claims limits the usefulness of qualitative research. They argue that if the researcher becomes too structured he will limit the study and not discover important occurrences. Being aware of this in an early stage we believe that we have prevented the tunnel vision through a flexible design of the interview questions. By giving the respondents the possibility to freely tell their story without too much interference from us we avoid the risk of missing important factors in the process.

2.6 Scientific Ideal (Epistemological considerations)

Our study is based on the understanding that it exist geographical areas with a higher degree of innovation and growth. It can however be discussed which factors in the environment it is that makes the areas develop faster towards a higher degree of innovation. Is it the surrounding environment in form of good access to educated employees and support from governmental organizations that creates the development? Or is it the individuals that work in the area that together creates a beneficial environment for development and innovation? This topic can be lead to a relevant discussion within the entrepreneurship field concerning the rational choice theory that in many ways has been the starting point for the research in the entrepreneurship field that deals with human behavior. It can be said that the rational choice theory is closely related to the neoclassical economic perspective. The basic assumption has been that organizations independent of their culture are dominated by a competitive pressure that in an efficient rational way guides the organization in its actions. This competitive pressure is created by market forces and can therefore be found in every market economy.

The individual entrepreneur is further from a neoclassical view seen as a rational actor that takes rational decisions on given signals. The implication of this would be that all dynamic business environments are ruled by the same rational logic which indicates that it is a rational and efficient decision making from a macro perspective that makes the difference between different geographical areas. The use of the rational choice theory as well as a neoclassical perspective in the entrepreneurship field has however been criticized as it excludes individuals and creativity as important factors.

39 Berg, 6-7
40 Bryman and Bell, 317
42 Ibid.
44 Dunham, L. and Venkataraman, S., From rational to creative action: recasting our theories of entrepreneurship
The rational economic theory can be linked to a positivistic scientific ideal concerning epistemological considerations. This due to that the positivism sees the human as an in the essence passive being that is governed by the surrounding reality\textsuperscript{45}, just as the rational economic theory sees organizations as guided by a competitive pressure from the outside. The positivism as a scientific ideal has its history in the natural science. The starting point for research in a positivistic spirit is that it exists just one logic out in the world. The researchers function is to measure this logic as the positivistic view considers everything to be measurable.\textsuperscript{46}

Our standpoint is that the rational theory can be useful in order to explain certain common factors for cluster environments such as access to educated employees or public goods. This is factors that characterizes a cluster and explains its development and success, that is the rational theory can be useful as it can give a good framework for theories concerning dynamic business environments. It is however necessary to include other factors such as culture, creativity and individuals as well when approaching an area as cluster environments. It might be that clusters all over the world are developed after the same logic in terms of competition access to employees but it’s likewise true that all these clusters are unique by the fact that they are built around different types of fields, industries and knowledge. Kista Science City is for example dominated by ICT firms while Italy has its leather clusters dominated by shoe and clothes manufacturers. It can further be argued that geographical areas with higher growth would not be able to exist if there was any dominant logic our universal truth in order to succeed because in that case other geographical areas would be able to duplicate the success factors of a cluster like Kista Science City without any bigger efforts. This makes us reject the positivistic scientific ideal as well as we reject the use of the rational economic theory as a dominant logic for this study.

What is it that makes the difference in culture tradition and creativity between different geographical areas? We argue that the difference between different geographical areas is made of the people or the individuals that acts in them as it is the people that have developed their knowledge, culture and traditions. We believe that this development takes different directions in different areas as people are different and thereby drive their development in different directions. The identification and development of business ideas is further very much related to knowledge, culture and traditions and it is in our opinion very hard to measure this development in a numerical way. It can therefore be said that we have an interpretive scientific ideal. The interpretive scientific ideal considers the world as a place where it is hard to measure what is true or false. The reason for this is that we understand and perceive the reality that we live in different ways as it is based on our earlier experiences. The focus of the interpretive researcher is because of this to interpret actions and relations in order to create an understanding about the world and how different phenomena’s are related to each other.\textsuperscript{47} We argue as we have been discussing before that every geographical area in form of a cluster has its own characteristics that have been built on different traditions and ways of thinking. The process of identifying and developing business ideas is further a complex process that is very much about the identification of new solutions to problems. That is it is a process that differs from time to time due to that entrepreneurs develop different ideas after different problems that they want to build a business upon. It can therefore be said that that it is very likely that entrepreneurs that have been going through a process of identifying and developing a business

\textsuperscript{45} Maj-Britt Johansson Lindfors, \textit{Att utveckla kunskap} (Lund: Studentlitteratur, 1993), 41-42
\textsuperscript{46} Hartman Jan. \textit{Vetenskapligt tänkande} (Lund: Studentlitteratur, 2004), 107
\textsuperscript{47} Lawrence Neuman and Larry Kreuger, \textit{Social Work Research Methods Qualitative and Quantitative Applications} (Boston: Allyn and Bacon, 2003), 77-82
idea will perceive this process differently depending on the content of the process and its outcome. One example can be that a successful entrepreneur that have sold of his firm that he started in Kista Science City for a big amount of money will perceive his entrepreneurial process as meaningful and fun process while an entrepreneur that risked all his fortune in a firm that ended in bankruptcy probably will perceive the process in more negative terms. It can further be argued that every individual that is active in Kista Science City have his/her own relation to the area where he/she perceives the reality of Kista Science City differently. This can be illustrated with that a CEO in a firm in Kista Science City probably have different assumptions about Kista compared to a student at the Royal Institute of Technology. Entrepreneurship and the creation of new firms are further very much about relations between people; relations that it would be very hard to measure. Our ambition is instead to try to understand how different relations and ideas have affected the entrepreneurs and their realities as they have started their firms, which requires that we focus our attention on the entrepreneurs and how they perceive the reality that they acts in. This can be reflected in our research problem and research objectives as we want to increase the knowledge about how the entrepreneurs perceive that a cluster environment has helped them in the process to identify and develop business opportunities.

The positivistic and interpretive scientific ideals are finally separated by their approach to objectivity. The positivistic ideal consider it as crucial to stay objective while the interpretive ideal sees objectivity as important but at the same time argue that it is impossible to always stay objective. Our investigation requires that we interpret the entrepreneur’s stories and actions with the implication that we will get personally involved with them as we meet and speak with the entrepreneurs. We see objectivity as important but we are at the same time realistic and realize that it might be hard. It can for example be that we get along better with one of the entrepreneurs and therefore pay more attention to his stories with the implication that overlook the other entrepreneurs. Our scientific ideal is therefore also here in line with the interpretive scientific ideal.

2.7 Transferability
Our choice of a qualitative method which is based on interviews with entrepreneurs in Kista together with our epistemological standpoint makes it necessary to discuss whether or not the results of the study can be transferable to other clusters and entrepreneurs. As we argued when discussing our epistemological view we believe that every cluster is a unique environment shaped by the people in it. Since the study will be located to only one cluster and involve just a few cases, our study will not be generalizable to all cluster environments. Some might even argue that the results are not generalizable at all. We however argue that the study can provide useful knowledge transferable to entrepreneurs located in other cluster environments than Kista. This because our ambition is that study will describe what support clusters might offer the entrepreneurs in their idea generation and development and this is not unique for only one cluster. Silverman describes this as the concept of possibilities, which means that we will not describe what support every cluster will offer for every entrepreneur but what support they possibly can offer the entrepreneurs.

Concluding that the results are transferable to other cluster we also need to consider to what type of clusters that our study most likely will target. Since we conduct our study in a high-

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48 Hartman Jan, 107
50 Ibid., 215-216
technological ICT cluster it is reasonable to believe that the transferability is higher to other high-technological clusters but not only to the ICT industry. This assumption we base on the different types of knowledge and resources that are needed in different industries. In high-technological clusters the time of development of products and need of capital for expensive equipment is generally higher than in clusters that are more focus on craftsmanship and inherited knowledge. This gives different types of needs for support in the idea generation and development process. It is therefore our belief and ambition that the results in this study will describe possible supports that high-technology clusters can provide to entrepreneurs and will be useful outside the studied cluster.

2.8 Choice of theories
The theoretical part of our thesis has been formed after three main objectives. The objectives has been first, to create an understanding for how entrepreneurs identify and develop business ideas in to new firms as a process, second to provide an understanding for what a cluster is and how it functions and third to describe why and how a cluster can support entrepreneurs in the process to identify and develop business opportunities.

With the theories of opportunity identification and idea development we want to create an understanding of how entrepreneurs come up with business ideas and turn them into ventures. It is important to know how and where opportunities can be found in order to understand what kind of support the cluster environment can bring to this process. Also which institutional factors that affects the development of the idea is presented since it is the core of the cluster theories. Many of the factors are interconnected to the cluster environment and are therefore interesting for this study.

The intention with the theoretical description of the cluster environment is to give a basic understanding and knowledge about what a cluster is and how it functions. We have gone back to the father of the cluster theory Michael Porter’s works for the first basic description of the cluster. Porter’s works regarding clusters are however of a basic descriptive nature where he generally describes what a cluster is and how it works but it can be argued that they are rather simple. Many studies have further been made since Porter gave birth to the cluster theory and his studies have contributed with an increased knowledge in the area. We have therefore complemented Porters theories with other studies that provide a deeper knowledge in certain areas.

Cluster theories do not only relate to what a cluster is and how a cluster functions. Much attention has been paid to create an understanding and knowledge about how and why clusters emerge and develops from a normal geographical area into a cluster. This is interesting for researchers and governments as clusters as industrial regions are interesting as they contribute with more growth and innovation. The objective with this thesis is however not related to the emergence and development of a cluster as a historical process. We are interested in the entrepreneurs that act in a developed cluster and we have therefore no included any theories about a clusters emergence and development.

It can finally be concluded that the theories that we have used mainly are theories that are used in macro contexts with firms as the population. Our theories focus on macro setting and firms might be interpreted as non-combinable with our individual perspective due that these theories normally do not put the individual in the center. We motivate this choice of macro theories with a firm perspective with that the objective with this study is to put the individual entrepreneur in the center in a cluster setting. Our ambition is therefore to use cluster theories
with a firm perspective and see if they are combinable with the reality for the individual entrepreneur out in the cluster environment.

2.9 Selection of sources
The starting point for our gathering of sources has been the literature in form of scientific articles that we used during the course dynamic business settings. We came during this course in contact with the main topics concerning cluster environments as well as important authors of scientific articles and books like Michael Porter. This knowledge has been used in order to search for more sources with the objective to deepen the knowledge in the area.

Three main channels have been used in order to find suitable articles and books. A number of useful books and dissertation could be found in the University Library. The main part of the scientific articles that we have used was found through data bases for scientific articles such as Business Source Premier. We have finally used Google Scholar in the search for articles but as well when articles have been tracked down.

We combined words like cluster, entrepreneurial activity, new ideas, new firms, spin-off, untraded interdependencies, knowledge flow and entrepreneurial process in the search for articles. A number of interesting articles was further found as we searched for the names of authors that have had an impact in the field such as Porter, Asheim or Keeble. We have finally been able to find articles through sources in other articles that we have read and used for the thesis.

2.10 Criticism of sources
The majority of sources in this study consist of scientific articles that we have found in the database Business Source Premier or that we have used in the courses of the master program. All of these articles have been review and published in scientific journals with high credibility and many of the authors are also well known within their area of research, e.g. Porter, Shane and Etzkowitz. A lot of research has been done related to cluster environments and the elements that the environment consists of. We have therefore been forced to limit our selection of sources since we cannot cover all research in this study. The selection has based on the relevance of the theories for the objective of the study.

The theoretical framework and the study in whole is very much built on Porter’s cluster theories which we then have backed up with other theories related to cluster environments. This we see as natural since Porter is world famous for these theories and is refered to in a very high amount of all articles written about clusters. We have no reason to believe that it has been harmful for the credibility to base the study on these theories since our objective is to study environments that has been called cluster by Porter.

Books, reports and other non-scientific publications used in this study have not been reviewed in the same extent as scientific articles and have therefore lower credibility. Due to this we have minimized the use them and mostly used these non-scientific sources in the introduction in order to explain the problem and for our methodology. We have also used some anthologies with scientific articles in our theoretical framework. These books have been edited by highly ranked researchers like Keeble, Asheim and Cook. The contributions to the books have been made by professors and researcher who are leading within their areas which gives the content a high credibility and we therefore see no problem of using them in our study.
3 Theoretical framework

In this chapter we present the theoretical framework which this study is based on. We give an introduction to the idea identification and idea development process. We also present the cluster concept and further develop areas linked to the cluster such as the concept of triple helix and untraded interdependencies. Finally we present the theory behind spin-off firms and entrepreneurs as organizational products.

3.1 Idea identification

Business opportunities or business ideas can be defined as: “the chance to meet a market need (or interest or want) through a creative combination of resources to deliver superior value”\(^\text{51}\). Whether or not everybody can recognize the opportunities has different answers depending on which theory we look at. In a neo-classical perspective the answer would be that all opportunities can be seen by everybody and the environment is signified by equilibrium. All information is available to everybody at any time. This has however been challenged by Shane who has shown that not everybody is likely to see all opportunities since not all people assess all information and has the knowledge to use it.\(^\text{52}\) Shane arguments are therefore more compatible with the Austrian school of entrepreneurship which is based on the distribution of information between people and markets.

The Austrian school of entrepreneurship claims that different people possess different information which creates possibilities to see opportunities in the market to take advantage of the information. The information can be used to invent a new product or service or production method which will create profit for the entrepreneur.\(^\text{53}\) As we later will explain, the amount of information available and the ability to adopt it and see opportunities is claimed to be higher in cluster environments than in the normal business setting.\(^\text{54}\) This is linked to the fact that social networks can play an important role as source of creative ideas. According to Kijkuit and van den Ende “‘good’ ideas are the result of having non-redundant, heterogeneous contacts that enable a person to generate ideas by combining diverse information”.\(^\text{55}\)

The identification process can be a conscious process where the entrepreneur is actively searching for new opportunities but it does not have to be. It might be that the recognition of an opportunity happens without any search. Drucker claims that the discovery of innovation opportunities most often is a conscious process and the opportunities can be found from seven main sources which can be both inside and outside the company.\(^\text{56}\) New process needs, market changes, incongruities and unexpected occurrences are inside factors while new knowledge demographical changes and change in people’s perceptions are outside sources where the search can be done. Drucker also states that without knowledge there will be no innovation.

If we go deeper into the sources of opportunity identification presented by Drucker we can say that internal sources of ideas are laboratory research, the companies desire to go into new


\(^{52}\) Shane Scott, “Prior knowledge and the discovery of entrepreneurial opportunities”

\(^{53}\) Ibid.


markets or from the companies employees. Then external sources which might be of more interest in our study since we are looking at the effects of the cluster environment and how it helps entrepreneurs can be trading partners like suppliers, customers or distributors. Informal contacts is also said to be important and give birth to many successful ideas which we will return to later in this chapter since this is a central part of the cluster theory.⁵⁷

In contrast to the systematic approach presented above, Shane gives another view of opportunity identification. ⁵⁸ He argues in a case study on MIT students who had come up with new inventions that people will find opportunities in the market without actively searching for them. Instead Shane argues that experiences and knowledge gained from an industry will be the most important factors that affects who will discover new opportunities. He claims that when people get new information and combine it with previous knowledge gained in, e.g. their work, they can put it together and come up with new ideas.

To see the problem and to shape it into an idea or several ideas of how to solve it is perhaps the most important stage in the entrepreneurial process. As mentioned earlier the entrepreneur must use his previous gained knowledge and combine it with the information from these sources and an innovative idea can come into place.⁵⁹

### 3.2 Idea development

After discovering an opportunity the entrepreneur can start to develop the idea further. Over time the entrepreneur will develop the idea from being a vague idea of a problem and a possible solution. It is very likely that he during this process will start to investigate how the best approach to implement the idea will be. The opportunity might just have been defined in one sentence but now the entrepreneur will create more substance to it. This process might include studying previous research and contacts with potential customers and co-workers.⁶⁰ A study by Klofsten reveals that the development phase of the idea is to a large extent linked to the technical knowhow of the entrepreneur. This knowledge is often gained from previous employments and is very useful in the new venture creation. The results from this study also indicate that the idea development process is more intense after the company has been created than before start-up.⁶¹

Through this process the idea turns into a concept of how to exploit the opportunity and the entrepreneur will focus on different issues that are important in order to successfully start up a new firm. The entrepreneur will have to define which markets to target, how the product or service should be designed, how to finance it, how to gain customers and how to deliver it to the customer. This will many times end up in a business plan.⁶² The idea development process can be seen as a non-linear process since the entrepreneur can all the time re-evaluate earlier actions taken in the process when new information appears and thereby work with several

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⁵⁸ Shane Scott, “Prior Knowledge and the Discovery of Entrepreneurial Opportunities”

⁵⁹ Bob Kijkuit and Jan van den Ende, “The Organizational Life of an Idea: Integrating Social Network, Creativity and Decision-Making Perspectives”

⁶⁰ Ibid.


⁶² Alexander Ardichvilia, Richard Cardozob, Sourav Rayc, “A theory of entrepreneurial opportunity identification and development”
issues at the same time.\textsuperscript{63} We therefore want to highlight that it is very likely that an entrepreneur during the idea development process will come in contact with issues such as financing and design of the product etc. It therefore depend very much on every situation how an entrepreneur will approach different issues during the idea development process. It can for example be that one entrepreneur needs a lot of money to develop his business idea, financing will then be an important issue and the entrepreneur will have to spend much time in the search for investors. Another entrepreneur might have a business idea that does not require much money but he might lack the right contacts to launch the idea to the market. He will then have to spend much of his time with a focus on gaining important contacts. That is the idea development process is a complex process that takes many different forms depending on the business idea, the entrepreneur and his preconditions.

Another issue that is important during the idea development process is the contacts that an entrepreneur has. It has been argued that the idea development process is a process of interaction between different individuals.\textsuperscript{64} An entrepreneurs networks is therefore of great importance during the idea development process. An example of this can be that entrepreneurs that have a new innovative solution for how to improve the performance of mobile phones need to get into contact with a mobile phone producer. It will then facilitate if he knows someone that works at Ericson or Nokia. A network is further important as the entrepreneur can get advices, feedback and help from friends and partners who can help him improve his business idea.

\textbf{3.2.1 External effects on the idea development}

The idea development process can also be affected by institutions and external environmental factors related to the new venture that is occurring. This is a result of that the entrepreneur often involves other persons in the idea development process.\textsuperscript{65} The implication of this might be that the entrepreneur will not always be in full control of the business idea even at this stage of the process. If financing is needed from venture capitalists or other external investors they will influence the development process in order to create maximum value for their investment. This is due to the normative pressure that these companies are working under. Davidsson et al. states that ideas often become broader in scope if there are more external investors involved in the development phase.\textsuperscript{66}

If the opportunity has come from a contact of a firm who in the future will be a major client of the new firm it also might change the initial idea into a certain direction. If the entrepreneur feels that it is important to meet the needs and wishes from this potential customer then the idea will be narrower and be adjusted for those explicit needs. These adjustments are made to become more similar to the customer in order to make transactions between them smoother.\textsuperscript{67}

A third institution that can affect the development of business ideas are incubators. In these organization a certain culture often exist which forces the entrepreneur to follow a norm procedure when developing the idea. The development phase is often more formalized and there is demand of a written business plan. This might have the effect that the initial idea is

\textsuperscript{63} Andrew Bragg and Mary Bragg, \textit{Developing new business ideas} (Harlow: Prentice Hall, 2005), 12-13
\textsuperscript{66} Ibid.
\textsuperscript{67} Ibid.
refined during the process and becoming narrower than it was from the beginning since this is the expectation in the environment. There can also be influences from the other incubator companies that are copied into the business plan.  

3.3 Introduction to the cluster environment

Geographical concentrations of economic activities have throughout the history been returning phenomena. From that the first societies was founded in beneficial locations around commercial our agricultural activities until the industrial revolution and the breakthroughs that took place in form of an increased manufacturing capacity. Firms and organizations have during this time been able to take advantage of close locations as proximity have facilitated interchanges of resources, capital, technology and other inputs between in firms as well as between firms. This has however changed with the globalization that distinguishes the 21th century. A firm’s activities can today be spread all over the world as it has become popular to outsource many parts of the production to countries where it is possible to find lower production costs. It has therefore been argued that location and proximity no longer are important factors for a firm in the globalized world.

Location and proximity have however reemerged as important factors for the development of firms and societies in a globalized world although in a different way. The theory of the industrial cluster has here emerged as the most dominant theory that explains this new importance of location and proximity for economic development. Porter defines a cluster as following: “Cluster are geographic concentrations of interconnected companies and institutions in a particular field” A more detailed explanation of Porters definition can help us to better clarify what a cluster is. The firms within a cluster are first interconnected companies and institutions in a particular field. A particular field as a term includes a wider range of firms than an industry. Firms in a cluster can be involved in similar and related activities without that they are competing in the same industry. Kista Science City is for example an ICT cluster. Two firms that are located in Kista are Ericsson and Microsoft. Ericsson uses the information and communication technology for the construction of mobile phones in order to compete in the mobile phone industry. Microsoft on the other hand uses the information and communication technology in their industry the computer software industry. That is Ericsson and Microsoft are involved in activities that are related but they are not competing in the same industry or on the same market.

The significance of a geographical concentration refers to that firms are located close to each other in a geographical area. The size of each clusters geographical area can differ from a very small geographical area to metropolitan areas, cities and regions. Kista Science City consists of the metropolitan area in Stockholm with the name Kista but the area has further been extended with other closely located areas as Akalla, Husby and Sollentuna. The size of the geographical concentration that makes up a cluster is however not what is most important in the definition of a cluster. It is instead more important that the firms in the area are

68 Davidsson et al., “Institutional Forces: The Invisible Hand that Shapes Venture Ideas?”
70 Porter, “Cluster and the new economics of competition.”
71 Bjorn Asheim et al., “The rise of the cluster concept in regional analysis and policy a critical assessment”
72 Porter, “Cluster and the new economics of competition.”
73 Ibid.
interconnected in vertical and horizontal exchanges. Firms in a cluster are interconnected horizontally as a cluster can contain different firms that are active in different parts of a production process. Some firms can for example be suppliers of products and services to other firms which produce the final product. Firms in a cluster are further vertical interconnected as many firms have their customers in the area. The interconnection is finally many times strengthened by governmental organizations and trade organizations that have been established in order to coordinate activities and market the cluster.

The cluster theory is built upon a basic assumption that cluster environments are characterized by a high competition. The competition drives the development in a cluster forward which leads to innovation and a higher productivity. A firm can thereby obtain a competitive advantage by being located in a cluster environment compared to other firms located outside of the area. The competitive advantage is based on a number of basic factors that distinguish a cluster environment from other areas.

### 3.3.1 Access to skilled employees

A cluster environment offers its firms the access to a broad base of skilled employees. The environment is often characterized by a high degree of labor movement which is an opportunity for firms to attract new skilled employees from other firms. It is further common that universities or science parks are located in cluster areas which are a second source of skilled employees for the firms. Clusters can finally attract skilled employees from other locations as cluster areas give a signal of opportunity.

### 3.3.2 Access to suppliers

A better access to specialized suppliers is offered as cluster environments are habitated by a many firms in the same field. Specialized suppliers can therefore easier start activities in cluster environments. It can be said that it is a win-win situation where the large number of firms creates a market for specialized supplies from which they can contribute.

### 3.3.3 Access to information

The access to useful information is high in cluster environments as many persons with the same skills acts in the environment. The persons develop both formal and informal links within the area which then contribute in order to get access to information.

### 3.3.4 Complementaries

The great amount of interconnected firms in cluster environment creates a source for complementaries in a number of ways. Firms can first contribute from that different firm’s products complement each other in order to meet customer needs. Firms can second collaborate and complement each other in the production of new products. The firms finally complement each other as they build a common reputation for the area which can serve as a

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76 Porter, “Cluster and the new economics of competition.”
77 Ibid.
78 Ibid.
79 Porter, “Competition and Economic Development: Local clusters in a global economy.”
useful tool in order to market one firm as buyers of products might be attracted by that the recognized the name of the location and thereby give more credit to a firms products.\footnote{Porter, “Competition and Economic Development: Local clusters in a global economy.”}

### 3.3.5 Access to Institutions and Public Goods

Firms in cluster environment can contribute from investments made by the public sector and investors. The public sector can contribute with specialized infrastructure, advices as well as the educational programs that are a source of new employees. Private investments can come from the outside but it is common that the investments come from firms inside the cluster as firms together makes investments in for example testing centers, infrastructure or educational programs. It is possible for competing firms to make this investment together as they can contribute from the result collectively.\footnote{Ibid.}

### 3.3.6 Motivation and measurement

A cluster environment as an area is populated of a large number of firms. The firms are able to monitor each other’s actions and performances. This is further reinforced by the formal and informal contacts in the environment which results in that occurrences and news about other firms are spread fast among the clusters population. This creates a strong pressure of competition among the firms in the cluster which leads to an increased motivation to perform well.\footnote{Masekell Peter, “Towards a knowledge-based theory of the geographical cluster”}

We can compare this with a body builder that are training local gym in a small village where he is the biggest guy. He is content with the amount of muscles that he has been able to build from his training four days a week. But one day he moves to Umeå and he starts to train a IKSU. The first training session is an upset for him as he finds out that there are a number of other body builders that are much bigger than him. He sees that they are training six days every week and that they furthermore are drinking Gainomax. He immediately starts to drink Gainomax and he increases his training to seven days a week. Or with other words he became more motivated by the fact that he was able to measure himself with other bodybuilders or with a new force of competition.

### 3.3.7 The diamond model

The factors from above contributes to the development of a cluster in three ways as they first increase the productivity, second creates a faster pace of innovation and third contributes to the creation of new firms. Porter has illustrated how these elements create a competitive advantage for a cluster environment in his diamond model. The diamond model contains four elements that together creates forms and shapes a cluster environment.\footnote{Porter, “Competition and Economic Development: Local clusters in a global economy.”}
The first element is the factors inputs which includes all the assets, tangible and non tangible that can be useful for firms in order to increase the competition. The following assets can be found in the factor inputs: natural resources, human resources, capital resources, physical infrastructure, administrative infrastructure, information infrastructure and finally scientific and technological infrastructure. The second element is the context for firm strategy and rivalry. The context for firm strategy and rivalry refers to the form of local competition that exists in an area. The spirit that governs the firms should be ruled by norms and incentives that are focused on innovation and high investments instead of imitation and low investment. The third element in the diamond model is the related and supporting industries which includes all the supporting industries that can be found in a cluster. The final and fort element is the demand conditions that exist in the cluster area.

3.4 Clusters and its contribution to the emergence of new firms
An introduction has been given that explains what a cluster is and how it is supposed to function. It will now further be described how a cluster can support entrepreneurs in their process to identify and develop business opportunities into new ventures. It has been argued that cluster environments offer entrepreneurs lower barriers to entry when starting a new business. That is it is supposed to be easier to start up a new firm in a cluster environment. It has been shown that entrepreneurial activities throughout the history have been gathered around certain geographical areas. High populated areas have for example always attracted more new start-up firms compared to areas with low population density.

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84 Porter, “Competition and Economic Development: Local clusters in a global economy.”
85 Ibid.
We can first conclude that all the factors that are essential for a cluster in general are factors that can support entrepreneurial activity in form of idea identification and idea development. An entrepreneur that are working to develop his business idea can for example benefit from access to skilled employees if he needs employees in order to develop his idea, if can further be useful to have the access to good suppliers or institutions and public goods. The complementaries can offer possibilities to find partners etc, which are necessary in order to continue with the development of idea. The demand for specialized suppliers could finally be an opportunity for an entrepreneur to build a new firm around.

3.4.1 Clusters and information
Cluster environments are supposed to offer more information about opportunities as many firms in the same field are gathered in cluster environments. The large amount of firms from the same field populated in a small geographical area makes it easier for individuals to get an overview over an industry. The individual can due to this easier perceive gaps in certain areas of an industry or a field. Each gap that an individual can perceive is an opportunity to build a new business around, which is a source of a new business idea.\textsuperscript{87}

New firms can further benefit from that the firms that populate a cluster develop a business environment for the area of how to do business. This environment of how to do business is tailored after the particular field that the cluster is built around. This can be beneficial for new firms as they do not have to waste energy in order to gather information about the business environment in their field as all the information is available within the geographical area of the cluster and therefore are easier accessible.\textsuperscript{88}

The higher access to information in cluster environments is referred to with many names such as innovative milieu, knowledge spillovers, collective/regional learning and untraded interdependencies. This is an important part of the cluster theory and will therefore be further developed later in the theoretical chapter.\textsuperscript{89}

3.4.2 Liabilities of newness and Credibility
It is common that new ideas are met with suspiciousness among other firms, institutions and customers due to their newness. This due to that new idea often leads to new unknown products or new unknown solutions to problems. It is therefore common that new firms with new ideas have problem to gain credibility among other firms, potential partners, institutions or customers. This is often referred to as that new firms suffer from liabilities of newness. Liabilities of newness is many time a problem for entrepreneurs during their idea generation and idea development process and it can take a long time for entrepreneurs to persuade the market in form of partners and customers that their new ideas or products are something that can deliver value.\textsuperscript{90}

A cluster environment can here help entrepreneurs in their process to gain legitimacy for their ideas. New entrepreneurial firms can for example gain a higher amount of trust if they engage in relations with individuals that are active in other firms in the area. This is facilitated by that a cluster environment is populated by a large number of firms from the same field which

\textsuperscript{87}Porter, “Competition and Economic Development: Local clusters in a global economy.”
\textsuperscript{88}Masekell Peter, “Towards a knowledge-based theory of the geographical cluster”
\textsuperscript{89}Asheim et al., “The rise of the cluster concept in regional analysis and policy a critical assessment”
offers new firms many potential partners. It can further be that the name of the clusters location in itself gives firms a higher credibility when they approach potential partners or customers as the firms in the area together have created a positive reputation around the name as a result of their success. An entrepreneur could then possible benefit from this in his development process as he becomes a part of the environment in the eyes of customers and partners.

### 3.4.3 Access to Capital
Access to capital and the financing is as has been described of essential importance for entrepreneurs in order to develop their business opportunities. Clusters can offer entrepreneurs better access to capital. Firms in the early stages of their idea development often get financing from private informal investors. It has been shown that entrepreneurs in Silicon Valley after that they had sold their firms took on a career as part time investors and thus provided a number of new start-up firms with capital. Informal part time investors often invest in firms located close to their home location which makes cluster environments to good investments areas for them. It is further possible for new firms to achieve capital from venture capitalist firms. Venture capital firms are traditionally located in locations close to each other’s a cluster is then a natural location to be placed in. This might be an explanation for why Porter argues that clusters attract venture capitalist. A better access to venture capitalists, private investors will of course increase new firms possibilities to gain investments. Porter finally argues that venture capitalists in cluster environments have lower demands on potential prospect firms to invest in as they are familiar with the industry in the cluster.

### 3.4.5 Proximity to customers
New firms can contribute from the large population of firms in a cluster since it is very possible that they will find future customers in the cluster. Proximity to customers can further be beneficial for new firms as it can lower costs for firms as closeness to customer allows them to: spend less time in the search for new customers, get faster responses, get good feedback on the quality of products and it can finally be useful as a firm can use close located customers in order to test new products.

### 3.4.6 Specialized Inputs
The transaction costs of new firms located in a cluster environments can be lower compared to new firms located elsewhere as they in the cluster can have the access to a number of specialized inputs. It can be access to expensive research tools, experts in advanced areas, pilot production facilities or just that they have the access to important knowledge such as occurrences that affects the development within a technological field.

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91 Cooper and Folta, “Entrepreneurship and High-technology clusters”
92 Porter, “Competition and Economic Development: Local clusters in a global economy”
93 Ibid.
94 Cooper and Folta, “Entrepreneurship and High-technology clusters”
95 Porter, “Location, Competition and Economic Development: Local clusters in a global economy.”
96 Ibid.
97 Cooper and Folta, “Entrepreneurship and High-technology clusters”
98 Ibid.
3.5 Informal Contacts and Untraded Interdependencies

The theory of cluster environments is built upon the idea that firms in geographical areas of close proximity develop close relationships as a result of interactions between firms and individuals. This generates knowledge a process of collective learning where knowledge flows between the firms which trigger the development in the area.\textsuperscript{99} The interaction can be divided into two different kinds of interactions. The first part of interaction is the formal exchange that takes place between firms in form of alliances, licensing or by pure economic transactions where firms sell and buy goods and services. Formal exchanges or traded interdependencies are normal economic transactions that take place all over the world. They take place both between firms closely located to each other as well as between firms located with a long distance between them.\textsuperscript{100} Porters model of a cluster is very much constructed after that the firms are interconnected in a number of traded interdependencies in areas such as the complementaries as well as when a firm use a local supplier\textsuperscript{101}. It has however been shown that it in some clusters do not exist any traded interdependencies among the firms as their traded interdependencies was stronger with firms located outside of the cluster area. The explanation of this might be that the firms instead are interconnected by informal contacts or untraded interdependencies.\textsuperscript{102}

Untraded interdependencies can be described as informal contacts and links that are developed as a result of social interaction that takes place between individuals that acts close to each other. The development is based on a shared base of knowledge and common understanding. The outcome of strong untraded interdependencies is that a world of local knowledge is created based on conventions, rules and practices. The knowledge is free for anyone that has the knowledge and skill to acquire it, which is that the knowledge is not tradable but untradeable. Untraded interdependencies exists together with the traded interdependencies in a setting with the difference that the untraded interdependencies are closely tied to the location of the setting. This makes the world of knowledge that the untraded interdependencies creates unique for the location with the implication that is free for firms and individuals located in the setting while it is not accessible for firms and individuals located outside of the location.\textsuperscript{103}

3.6 Communities of Practice

The outcomes of well developed untraded interdependencies in a geographical area are a social interaction between individuals in different firms and organizations that generates a dynamic knowledge flow.\textsuperscript{104} One popular theory that has been used in order to explain the development of untraded interdependencies as a process is the theory of communities in practice. The idea behind communities of practice is that learning is the outcome of social interactions. The theory is built upon that knowledge can be related to the history as learning of new phenomena takes place over time. It is further necessary that a group of people takes the learned knowledge for true which relates knowledge to social contexts. Our acquired knowledge is finally based on our past experiences and the learning experiences that we have had in our lives. The result of this is that learning takes place as interplay between our past

\textsuperscript{99} Keeble, “Collective learning processes in European High technology milieux.”
\textsuperscript{101} Porter, “Location, Competition and Economic Development: Local clusters in a global economy.”
\textsuperscript{102} Hendry et al., “Regional Clustering of High-Technology based Firms: Opto-electronics in Three Countries”
\textsuperscript{103} Tallman et al., “Knowledge, clusters and competitive advantage.”
\textsuperscript{104} Ibid.
experiences and the knowledge that is defined by the social context in which we are living and learning in.\textsuperscript{105}

It can be said that every individual lives and acts in different social contexts. The owner of the local pub can for example see himself as a pub owner or business man but it might be that he further is a father, a supporter of the local football team or a person interested in history. That is he acts in a number of social contexts. The theory of communities of practice sees each of these social contexts as a community of practice. A community of practice can be defined as communities formed by different individuals that share cultural practices. The members are linked together by that they have developed a common understanding, established norms and relationships that have been developed as a result of interaction. A community of practice has finally developed shared attributes in form of languages, routines, stories and styles etc. The interplay of learning takes place between individuals and the community as the individual can affect the community as he enters with new experiences that can be new knowledge. But he can also learn from the community as the community has knowledge and experiences that the individual did not posses before. That is the interplay of learning is a two-way relationship where both the group and the individual can learn from each other. Learning can further take place between different communities of practice as individuals that belongs to several communities’ carries knowledge with them. The local pub owner can for example as a business man bring valuable knowledge to the supporter union of his team of how they should make the declarations in the best way. That is the knowledge is spread between different communities as individuals interacts between the different communities that they belong to.\textsuperscript{106}

One individual can develop different ties to different communities of practice as he interacts in different kinds of practices. A supporter to the local football team is can for example belong to the teams community of practice at the same time as he is working as a teacher in a school and thereby identifies himself as a teacher and football supporter at the same time. An individual can thereby identify himself with the organization that he works in but further after which kind of profession he has or after the class he was in at the university. This individual can thereby interact in different communities of practice at the same time where he shares the knowledge that he has been acquiring after different experiences. It can finally be said that the knowledge flow is facilitated by that the members of a community of practice can identify themselves with each others as they many times share similar backgrounds and values.\textsuperscript{107}

3.7 Clusters, Untraded interdependencies and Communities of practice

It is possible to see a cluster as group of communities of practices that are connected through different individuals. The fact that a community can be extended throughout many organizations\textsuperscript{108}, can then help us explain how knowledge can be spread between organizations without formal contacts in a cluster. The knowledge flow can explains why there is more information available in a cluster. The information is finally hard to get access to for individuals and firms located outside of the location due to that the untraded interdependencies that are developed are very dependent on proximity\textsuperscript{109}.

\textsuperscript{105} Wenger, E.”Communities of practice and social learning systems”. \textit{Organisation}, 7(2), 225-246. 2000

\textsuperscript{106} Ibid.


\textsuperscript{108} Ibid.

\textsuperscript{109} Tallman et al., “Knowledge, clusters and competitive advantage.”
Untraded interdependencies can further help us to understand other elements in the cluster theory as the communities share similar backgrounds and the same values as well as they have developed shared attributes and languages. The higher motivation to perform well in cluster areas can be explained by this as it can be seen as a part of the values and attributes that the individuals in the cluster environment have developed together as a result of their interaction in their communities of practice. We finally see each community that an individual belong to as a network that the individual has access to.

### 3.8 Untraded Interdependencies – Idea identification and idea development

The existence of untraded interdependencies among firms and individuals in a cluster environment can help us to understand why there is more information available. High amounts of information can be useful for entrepreneurs that conscious or unconscious are looking for business ideas due to that the discovery of business ideas very much is related to the knowledge and experience of the entrepreneur. More available information enables an entrepreneur to increase his knowledge and experience in an area. It can therefore be argued that an entrepreneur that resides in a place where more information is available would have bigger chances to get more knowledge and experience something that would increase his/hers possibilities to identify a business opportunity and turn it into an idea. A cluster environment would thereby support entrepreneurs in the process to identify business ideas as they offer the entrepreneur high amounts of information. The access to untraded interdependencies in a cluster environment can further support an entrepreneur in the development of his business idea for much the same reason as more information and access to knowledge can help the entrepreneur to strengthen the development of the business idea. It can further be argued that an entrepreneur that actively is searching for business ideas might increase his motivation if the cluster is dominated by a positive entrepreneurial spirit. Network is finally important for entrepreneurs both for the idea identification as well as for the idea development. An entrepreneur would then have access to useful networks in a cluster if we see a community of practice as a network.

### 3.9 Triple helix and the flow of knowledge

The concept of triple helix describes the relationship between university, state and industry and the degree of interaction between these two. A triple helix can be described as natural collaborations and exchanges that emerge between people from these three actors who all have different knowledge, background and perspectives and then there might come up new ideas.\(^{110}\)

There are three models of the triple helix depending on the power of each of the helixes. In the first model the state is powerful and controls the direction of the university and the industry and can be found in strong socialistic countries and existed e.g. in the Soviet Union. This model does not encourage bottom up innovations because the state is in control of it. In the second model all of the three parties are equally strong and act independently. There is not much interaction between them since all of them protect their own territory. The third model is the one that is considered as best for knowledge transfer and is the model we are focusing

on in our study because it can provide the most support to the individual entrepreneur in the entrepreneurial process.\footnote{111}

The third model is characterized by high interaction between firms, universities and governmental agencies through networks and hybrid organizations. This is seen as overlapping between the different helixes and the innovation occurs where they meet. The interactions between actors within each of these groups create alliances and bases for knowledge flow within the region which creates a higher pace of innovation than in the model where everybody focuses on their own inside knowledge and are not sharing it with others.\footnote{112}

![Diagram of Triple Helix models](image)

**Figure 2: Models of Triple Helix two and Triple Helix three.**\footnote{113}

The idea behind this is that trust among the actors creates a higher flow of information which the individuals that are exposed to this information quickly can adopt it as knowledge and make us of it.\footnote{114} The contact between people is therefore very important. It is also important to be aware that individuals, on their own, have less capability to come up with innovation than if they interact with other individuals since the flow of knowledge is then less.\footnote{115}

Knowledge flow is then the keystone of triple helix idea. Competitiveness demands that everybody in the cluster have up to date knowledge in order to keep up the pace with the outside world. The triple helix helps individual entrepreneurs to question existing knowledge and to understand new inputs and thereby solve problems in form of innovations which can lead to new companies.\footnote{116} This knowledge-flow often occurs without any formal agreements to share information or knowledge between the actors. Instead it arises as a spillover effect in the personal meeting between individuals in different situations, e.g. meetings with suppliers, customers or scientists. It is further argued that this is facilitated by proximity between the actors and individuals since it takes several meeting before the knowledge is transferred. With greater distance the spontaneous meetings will not happen as often as if they are located close to each other. This can be linked to the matter of trust between the actors. With more meetings

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\footnote{111}{Henry Etzkowitz and Loet Leydesdorff, “The dynamics of innovation: from national system and Mode 2 to a Triple Helix of university-industry-government relations”, Research Policy, 20, (2000): 109-123}
\footnote{112}{Ibid.}
\footnote{113}{Ibid.}
\footnote{115}{Saad, “Issues and challenges arising from the application of innovation strategies based on the triple helix culture Experience of the incubation system in Algeria”}
\footnote{116}{Ibid.}
they will create a closer relation and trust will be built. It also makes the transfer of tacit knowledge easier than if the meetings are few.\textsuperscript{117}

A benefit for the triple helix to work in a cluster is that many people within the same industry or profession are located close to each other. This creates more spillovers than in other areas which could have a positive effect on individuals who want to start new firms. Technological capabilities also makes it more easy to make use of the spillover from advanced firms and the ICT cluster in Kista has a workforce with these capabilities which makes it likely that they can adapt this knowledge quite well.\textsuperscript{118}

In Kista we can find several institutions where the co-operation between the state, academia and industry has taken the form of research institutes, incubators and organizations for seed financing for new firms. The Swedish Institute of Computer Science (SICS) is one of those organizations that is partially owned by the state and the industry and facilitates research in the area\textsuperscript{119}. The best example of this is the organization Kista Science City that is the spider in the web that governs and leads the collaboration in order to develop Kista as an area. The organization contains the firms that are located in Kista, the municipality is actively participating and the Royal Institute of Technology is finally tied to the organization. STING the local incubator is a result of this collaboration.\textsuperscript{120} Informal meeting places have further been created in the Kista shopping mall in order to facilitate meetings between people that work in the area. One example of this is the food court which is a big open space with many restaurants around it.

3.9.1 Triple Helix- Idea identification and idea development

The third Triple Helix model can be seen as the result of well developed untraded interdependencies between three important actors in a cluster the state, the industry and the academia. We see it as an example of three communities of practice that are interacting with the result that more knowledge and innovation are created. It can be that organizations that are created as a result of triple helix cooperation could be the source of new innovation as it is three different worlds with different knowledge that interacts. An individual that has the possibility to participate and interact in such cooperation would then have very good possibilities to acquire new knowledge and experience which could increase the likelihood to discover a new business opportunity. We further described that a triple helix can help individual entrepreneurs to solve problems in form of innovation which could lead to new firms which can be seen as an illustration of this. One form of triple helix collaboration is finally the incubator which will be further described in the next part of the theory.

3.10 Incubators

Business incubators and science parks have become a popular and often an important institution that can be found in cluster areas and close to universities. It has also been used in business politics to increase the number of firms in regions with low levels of entrepreneurship. Government, universities and municipalities often invest a lot in these organizations. The aim of the incubators are to assist upcoming ventures in the early


\textsuperscript{118} Alcácer and Chung, “Location Strategies and Knowledge Spillovers”

\textsuperscript{119} www.sics.se, 2008-05-15

\textsuperscript{120} http://www.stockholminnovation.com/sv/article/organisation_0, 2008-05-15
development phase, which often is a hard time for many new firms, with different supporting elements that can help them to stand on their own later on. The difference between incubators and science parks can be described by the age of the firms in them. Incubators have most often very young firms while science parks are better suited for more mature companies that have come quite far in the development process.  

These elements that incubators assist companies with include the provision of cheap office spaces which otherwise can be hard for a new company to afford when they have no customers and no ready product to sell. Being located in the same building as other companies also gives the chance to share resources. These shared resources, e.g. copy machines, reception, coffee room etc. keeps the costs down. At the same time the shared facilities offers a possibility to create a network for the entrepreneur. Meeting other entrepreneurs in the same development stages offers a chance to discuss problems and how to solve them. Most incubators also offers coaching or some kind of business support where the entrepreneur can get advices from more experienced people or have access to people with needed expertise, like lawyers. This is a very important element in the incubators role to help new companies. Bergek and Norrman argues that it is the existence of business support for the firms that makes it an incubator since the other things can be found in a normal business hotel. Finally the incubator gives the firms in it access to external networks which could be hard to enter without the support. This network could be access to universities, venture capitalists, advisors etc.

3.11 Incubators- Idea generation and idea development

Incubators can be seen as triple helix collaboration as it is common that universities and municipalities through incubators are involved in the creation of new firms for the industry. We recognize that incubators can offer entrepreneurs great support during the process of idea generation and idea development. It can on the other hand in our opinion be discussed how specific this support is for a cluster environment due to that incubators are common phenomena in all kind of geographical settings. The reason for why we included the incubator in our theory is that it is that incubators are organizations that often exist in clusters and it is therefore very likely that entrepreneurs in cluster settings will get support from incubators. This support will therefore most likely affect their process to identify and develop their business ideas.

3.12 New start up firms in cluster environments

3.12.1 Entrepreneurs as organizational products

When we explained how entrepreneurs can discover opportunities and ideas we mentioned that previous knowledge and work experience are important factors for this. This means that many entrepreneurs will start their new company in the same field that they previously have worked. Some studies has shown that 70% of all entrepreneurs who have started a company has done it in a field close to their previous work and in another study 58% of the founders of new companies had gotten their idea from their previous job. The study therefore points out that entrepreneurs often are organizational products because the existing organization provides many of the resources necessary to start a new company. Organizations provide

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122 Ibid.
knowledge of the industry, they also provide the social ties already described in this study and they also provide a possibility for the employee to build confidence to take on opportunities. The entrepreneur also has an existing social network to use in this organization and sometimes even licenses. The social network does not only come from the last company where the entrepreneur has worked but is instead something that an individual builds up during his entire career. This indicates that a social network is something that is related to several companies.

3.12.2 Spin-offs

The entrepreneur as an organizational product leads us into the question of spin-off firms. Spin-offs are a common phenomena in cluster environments, a study by Keeble concluded for example that at least 50% of the new firms in many cluster settings where spin-offs. The term spin-off is a diffuse term that is used differently in different studies. There are two basic assumptions about what firms can be called a spin-off. The more précis definition of the word requires that there is some kind of transfer of rights from the parent firm to the new spin-off company like patents or other assets. The broader definition is that the founder should have gotten the idea in a previous employment and started a new company based on that idea. Then there is no need for legal agreements or transfers between the companies and thereby includes many more companies into the category of spin-off.

Depending on the background of the founder and where the idea has originated the spin-off firms can be divided into separate categories. These are university spin-off, corporate spin-off and finally institutional spin-offs which is companies that has originated from other organizations than the first two categories. These are based on the previous employer who has acted as the parent of the idea. In the case of university spin-offs the term is used when the idea consist of intellectual property that has been created by students or employees of a university. It does not have to be the founder of the company who comes from the academic world. This can be seen as the definition of a spin-off based on transfer of legal rights.

There are also different opinions about which organizations that are most important as parents of new ideas. Some authors argue that large established firms and universities are the most important sources of high-technology firms since they possess substantial resources while other argue that other small technology based firms are most important as parents to new technology spin-offs.

The different kinds of spin-offs become interesting for our study since they can provide different types of support for the entrepreneur. An entrepreneur that has started his company as a university spin-off might experience that the environment has given him much higher support than an entrepreneur who has created a corporate spin-off. Previously universities often tried to commercialize new inventions through large established firms in co-operation. This lead to that many inventions never came into the market since there were no buyers for

125 Keeble, “Collective Learning processes in Europeans High technology milieux.”
127 Ibid.
129 Lindholm Dahlstrand, ”Entrepreneurial spin-off enterprises in Göteborg, Sweden”
breakthrough technology. Therefore many universities today have created a support network and incubators with the task to support the inventors of new ideas that arise within the university. Universities can tie up partners from many different fields of expertise who can assist the student or researcher who want to start up a company around the new findings. In Umeå the university work closely with Uminova Innovation which we also explained that we have own experience from since we worked with them during the core courses on the master program.

On the other hand a founder who has left his previous employer might not have the same support from his environment. If the spin-off is regarded as a hostile action by the previous employer it is reasonable to believe that there will not be much support from the parent organization of the idea. Then there are those spin-off companies that are sponsored by the parent organization and are offered financial and managerial support after the start-up of the new venture.

The reference to spin-offs as a central part of the new firm creation in cluster settings have however been criticized as it can be considered a too simplistic view. Harrison argues that to much focus have been given to the parent firm as the source for a new firms in form of a spin-off. He states that it instead is necessary to study the entrepreneur’s history before the new venture creation during a longer time. It might be that the entrepreneur worked for several other organizations before he started at the parent organization and it is then very possible that he acquired much of the necessary experience from other organizations than the parent organization. This would in our eyes indicate that it is more likely that entrepreneurs are organizational products instead of spin-of products from just one organization.

3.12.3 New firms from the outside
New firms can further be created in cluster environments when entrepreneurs from other locations decide to create new firms in the cluster environment. The entrepreneurs are attracted to locate their new firms in the cluster environment due to that an innovative and high productive cluster creates a strong position within its field or industry. The cluster thereby give individuals located outside of the location a signal of opportunity which makes entrepreneurs motivated to locate their firms in the cluster environment. The new firms from the outside can contribute with new knowledge which can work as new energy that steers the clusters development forward.

3.13 New firms in cluster environments - Idea generation and idea development
The entrepreneur as an organizational product, spin-off firms and firms from the outside is interesting in our study due to that a firms origin can give us information about the

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130 van Burg, “Creating University Spin-Offs: A Science-Based Design Perspective”
131 Ibid.
134 Ibid.
135 Maskell, “Towards a knowledge-based theory of the geographcial cluster. Industrial and corporate change”
136 Porter, “Location, Competition and Economic Development: Local clusters in a global economy”
137 Maskell, “Towards a knowledge-based theory of the geographcial cluster.”
entrepreneurs idea generation and idea development. It can be assumed that new start up firms in a cluster that comes from the outside did not get the initial business idea from the cluster environment, this because they did not have much contact with the cluster before the foundation of their new firm. New firms from the outside would thereby not get support from the cluster environment in their idea identification. It can however be that a new start up firm get support from the cluster during the idea development process as the firm then is located in the cluster. Spin-off firms on the other hand can have gotten support from the cluster environment both during the idea generation and the idea development as the persons involved in the process where located in the cluster before the creation of the firm. The origins of the firms are however not interesting for us in our analysis in terms of which kind of spin-off category they belong to. What is important is instead whether or not this support can be linked to the cluster environment or if the support could have been the same outside it.
4 Practical method

In the practical method we argue for our selection of respondents for the empirical data collection. We further describe the structure of the interview and how they have been carried out in practice. We also argue for our structure of the empirical presentation.

4.1 Selection of respondents

The objective of the sampling process is to find a small group of people who can represent a larger population.\textsuperscript{138} The purpose of the study is to examine how cluster environments help entrepreneurs to identify and develop business ideas into new firms. This gives us some criteria of which characteristics the selected subjects need to have in order to give valuable information for our study. According to Ritchie and Lewis the chosen persons should represent and symbolize the group we want to study but as long as the selected people meet the criteria we have set up for our sample it is positive that they have differences between each other. This enables us to find more information about the subject and reveal as many important factors to the problem as possible.\textsuperscript{139}

The criteria we used in our sampling are based on the purpose of the study. To be able to see how cluster environments support individual entrepreneurs in the idea development phase we need to examine entrepreneurs in cluster environment. The criteria used in the sampling were that the person we wanted to interview should be the founder of the company since the founder can best describe how the company’s idea emerged and has developed. The company should have started their operations in Kista. By this we do not mean the legal registration of the company. It is more important that most part of the development of the idea or product must have been carried out in the cluster. The company should also be within the ICT sector since we are studying an ICT cluster. We are therefore not interested in hotels, restaurants and other industries that can be categorized as complementary industries in the cluster. We finally excluded firms that were founded before 20001 because the cluster might have gone through a lot of changes compared to how it was before the IT crash in the beginning of this century.

To find possible company founders to contact we searched information about new firms in Kista on the Internet. In a report written by the organization Kista Science City we found a list of companies started in the region between 2001 and 2006\textsuperscript{140}. The list described what the companies operation was and who have founded it and also provided us with links to their homepages so we could further investigate if they where possible candidates for our study. On the list it also was mentioned if the company had received support from the local incubator program STING (Stockholm Innovation & Growth). We tried to minimize the number of companies in the study who had received this support since we wanted more diversity in our selection. Too many of these companies could have given very similar answers since the incubator organization might contribute with a lot of support to the entrepreneurs that is not specific for the cluster environment. However it was interesting to have at least one of these included in the study since they could provide different information valuable for the study.

We then selected the most interesting companies from the list based on the criteria we had, and called the founder which was easy to reach since we already knew the name of this person. We contacted seven different founders and five agreed to do an interview with us.

\textsuperscript{138} Berg, 30
\textsuperscript{139} Jane Ritchie and Jane Lewis, Qualitative Research Practice (London: SAGE, 2003), 83
\textsuperscript{140} http://www.kista.com/sv/article/informationsmaterial, 2008-04-17
One of the founders was also interested but did not meet all criteria since the company was not located in Kista. The last person did not reply to our message that we left to the person who answered the phone at the company. This indicates that the person was not interested.

There are several factors that we have taken into account when we have decided the size of the sample. How many selection criteria we use, how diverse groups we are studying and if the interdependency between criteria is to be studied are factors that guides the size of the sample and budget is a factor that limits the sample. The qualitative interview can provide a lot of information with a lot of details. Therefore a large sample also makes it troublesome to handle all the gathered information in a good way. Since we have few criteria to meet in our selection of entrepreneurs and we not are looking for interdependency factors in this study we have chosen to have five interviews.

4.2 Design of the interviews

Our objective with the study is to increase our understanding about how the cluster environment can help entrepreneurs it is important that the respondents we interview have the chance to tell their story and tell their story without too much interference from us. The qualitative or in-depth interview method allows the respondent to tell us his/her story in an informal conversation. This makes it possible for us to understand which factors in the environment the entrepreneurs have been affected by in their opportunity identification and idea development process.

Since we have a deductive approach in this study and want to explain the experiences on the basis of the cluster theories that exist we need to control the interview in a way that makes it possible to cover all studied areas. However we do not want to limit the respondent’s answers since we then might lose important information. Therefore we decided to use a semi-structured approach for the interviews by using an interview guide with questions covering different topics from the theory. In this way we could steer the conversation in the direction we wanted without limiting the respondent’s answers which is the purpose of this approach.

The questions were designed to give information about areas linked with the theories we have presented the in previous chapter. We have used open questions and we have also been careful to avoid leading questions. We have tried to design short question without using terms from the theory since the respondents may not understand what they mean. To find empirical material for the opportunity identification the first questions in the interview where about how the business idea that the company was based on had came into existence. The following questions focused on the development process for the idea, the product and the company. The aim of the questions concerning the development process was also to see which other parts in the theory that had supported the process. The answers to these questions could also spread light on the parts of the triple helix in Kista, how networks and untraded dependencies that had been useful and in what way the entrepreneur felt that the location of Kista had supported the start-up process.

In which order we have placed the questions is also important since we need to build the confidence between us and the person we interview in order to get valuable information later.

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141 Ritchie and Lewis, 83-84
142 Jan Trost, *Kvalitativa intervjuer* (Lund: Studentlitteratur, 2005), 23
143 Bryman and Bell, 363
144 Ritchie and Lewis, 155
To get the respondent relaxed and willing to open up it is good to start with a question that is familiar and easy to give an informative answer to. We therefore started with a presentation of us and what we did and let the respondent tell us about himself and the company and gradually asking more complicated questions. By presenting the study we also could direct the conversation to the topic of the interview in a natural way. 

4.3 The interviews in practice

The interviews were recorded after we had asked for permission of the respondent to do so. We recorded the interviews because we wanted to listen to it again and also to write them down on paper in order to do a better analysis of what the respondent has said. By recording we also did not have to take any notes during the interview which can be disturbing for the respondent since it is more apparent that we are documenting his answers. The aim of the transcription was to be able to go through the interview afterwards and to not forget important information and thereby do a better analysis.

Four of the interviews were conducted by both of us and the last one was done by only one of us. The fact that we were two interviewers can according to Trost be suitable since we are fairly inexperienced as interviewers. If the interplay between the interviewers is good it can be possible to get more information than with only one interviewer since they can complement each other. We think that we complemented each other well during the interviews and since the interview done by only one of us was conducted last we do not think it affected the quality of the interview in a significant way.

The atmosphere during the interviews very in most of the cases very relaxed and the persons we interviewed thought it was fun that we had found them and where glad to help us in our study. They all tried their best to give us a clear picture of how the idea had come up and how they had developed it further. The interviews took about 30 minutes to complete. The only problem we felt during the interviews where that it was hard to dig deeper into the initial answers we got. Since we wanted to dig deeper into the different elements of the answers, it was quite hard for the persons we interviewed to develop it any further because it cannot be said exactly how it emerged since it is a diffuse process that is constantly changing. This can be because it is hard for the individual to describe it since much takes place in the daily life and is not something that they reflect over. Therefore we have not got the complete picture of the environmental support in the cluster. To fully understand how all networks and untraded interdependencies comes into place and affects and supports the entrepreneurs an observation study of one case could be needed over a longer period of time. Then the researcher could see which people and in which networks that the entrepreneur interacts and get support.

4.4 Structure of the empirical presentation

As mentioned in previous part the interviews were recorded and transcribed directly after the interviews. These transcriptions help us to interpret the answers and to distinguish the most relevant parts to present in the study. In order to ensure that we do not have misinterpreted the answers given by the respondent we have sent them the summary of the interview.

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145 Trost, 64
146 Rithcie and Lewis, 145
147 Trost, 54-55
148 Bryman and Bell, 374
149 Trost, 46
We have chosen to present the interviews as five different cases. The presentation in form of case is to transmit the knowledge about the reality that we have found in our interviews. This is also in line with our perspective of the entrepreneurs since we present the facts as they have presented it for us. The empirical chapter is further presented with regard to what later will be analyzed.\textsuperscript{150} We also want to present the interviews separately since our opinion is that every entrepreneur has a unique story that needs to be expressed as its own case. Even if they are presented separately all cases have the same structure which makes them easy to follow. Since we have summarized the interviews in this way we also avoid presenting information which is not interesting for the analysis.\textsuperscript{151}

The structure of every case have been designed in order to first; give the reader an introduction to the entrepreneur behind every company, second; give a basic knowledge about the company and third; relate the interviews to the theory in a way that is easy to follow. We followed our research statement when we related the empirical framework to the theory. The research problem was "\textit{How does cluster environment support individual entrepreneurs in the process to identify and develop business ideas?}". The theories that we have used in order to describe the cluster environment is quite extensive and they have many different elements. We therefore believed that it would be easier for the reader to get a good overview if we designed the empirical presentation after the identification and development of the business idea. We further believe that it will be easy to get a good overview of the empirical presentation and the analysis this way as the idea generation and the idea development are chronological occurrences.

In the analysis we will present in what ways the Kista environment has supported the entrepreneurs in their opportunity discovery and development process. We will compare the empirical findings with the theoretical framework in order to see if we can find theoretical support for the findings we have presented. To make the analysis easy to follow we have chosen to follow the same setup as we had in the theory chapter. Finally we will make some conclusions about the study and discuss to what extent the study is practically applicable to other situations.

\textsuperscript{150} Nylén, \textit{Att presentera kvalitativa data} (Malmö: Liber Ekonomi, 2005), 70-71
\textsuperscript{151} Trost, 114
5 Empirical Presentation

In the empirical chapter we present the material from our interviews with the entrepreneurs in Kista. The interviews were carried out in Swedish and all citations have therefore been translated by us into English.

5.1 Smarticware - Omid Aval

Background Omid Aval

Omid Aval is a qualified engineer in electrotechnics a degree that he obtained at Chalmers University of technology. He has been working in several companies such as Ericsson Microwave Systems, Semcon Engineering, and Sonera Smarttrust. The job assignments have been diversified throughout his working career as he has worked as a consultant and been involved in development projects of patents. He has further experience in many fields of management such as company management, sales management and project management. Omid Aval has finally been active in Kista since the end of the twentieth-century where he was working for Semcon and Sonera Smarttrust until he founded Smarticware.

Smarticware

Smarticware was founded in 2002 by Omid Aval. The company provides the market with solutions based on technologies related to smart cards. Smart cards are the cards that stores information in electronic devices such as debit cards and digital passports. The technology Smarticware use enables the smartcards to store fingerprints and facial appearances which can be used in order to match and identify people. Smarticwares technology is based on new and innovative knowledge which gave them the job to standardize the new digital European passport. The standardization project was started in 2004 and was finally finished in 2007. Smarticware has after this continued to offer governments and corporations different solutions based on their smartcard technology.

The idea identification

Omid first got the initial idea to Smarticware when he was working at Sonera Smarttrust with SIM-cards for mobile phones. He discovered that the SIM card was not that advanced as he believed that it was possible to increase its memory. He had during his time at Sonera Smarttrust generated almost fifty ideas which he wrote down and sent to an American venture capital firm that he got in contact with through friends he had in England. The venture capital firm was interested in his idea concerning the SIM cards which lead to that they wanted to buy his idea. The deal was however never completed as the venture capitalists had to retreat as a consequence of the September eleventh attacks on the World Trade Center in New York and the downswing in the economy. The result of this was that Omid instead alone went on to turn his idea of a solution for smartcards into a profitable business.

Omid relates the generation of his ideas to his personality. He describes himself as an ingenious person that always wants to learn more, a person that wants to discover new solutions to problems or do things in new different ways. The knowledge he acquired during his time at Chalmers was further very diverse which has been giving him the possibility to combine different elements of knowledge into new innovative creations. He further relates this to his time at Sonera Smarttrust when the firm was bought up by a Finnish firm which led to problems as two business cultures meet and clashed. The implication of this was that the firm got problem and not much was done. Omid describes this as that the employees went to
work and did not do anything. Omid however used this time to work and generate ideas as well as observe and learn from what was going on when in the company. He arrived first to the office at the morning and left last on the night every day, all the time he took in knowledge in order to learn in for the future. He believes that this characteristic in him as a person was the source to his success and his idea generation.

**The idea development**

Omid argues that Kista has had a big importance for him in his work with Smarticware. He realized already when he founded the company that it would be necessary to be located in Kista. He came in contact with STING and Smarticware became the first company that took advantage of the office space in STINGs incubator. Omid further describes Kista as a community where he can walk in the shopping mall and meet old friends from his time at Chalmers as well as he can make new contacts. He has been able to establish many important contacts in Kista that have been useful in his work with Smarticware. It was possible for him to phone experts that he knew and get help if he ran into a problem in a certain area. Small jobs get done faster in Kista as everyone is located close to each other. The proximity is in Omids eyes further beneficial as face to face contacts give another kind of personal chemistry that facilitates learning in another way.

Omid gives an example of how Kista and the proximity took him a big step forward in a short time. One of his employees was a smoker and used to go out of their office to smoke. Other firms such as Siemens, Infinio and Epocs were located in the same building and the employee got in contact with the highest boss in Kista for a firm. Omid later thought that he needed to get in contact with some key persons in order to proceed with his project to standardize the EU passport. He called the boss whom knew who Omid was as they were located in the same building and by that he used to meet his employee when he was smoking. The boss was very positive to this and immediately called his highest boss in Germany who flew in two days later to meet Omid, or as Omid himself described it:” I thought we had to find some key persons, it was very easy. Lars had already meet this person, I will tell him and POM POM only two days and the highest boss from Germany flew in to meet us, we found the right channel”. Omid argues that it would have been much harder to make a call like this if he would not have been located in Kista as he would not have been meet with the same amount of trust. He relates this to that the boss knew where Smarticware was located, what they did and the boss finally knew who Omid was. He further evolves this as he relates Kista to normal business culture where it is important to dress well when one meets customers etc. Omid says that being located in Kista is a part of this culture in the ICT field it gives a higher credibility to a firm. Omid finally meet many of the persons in Smarticwares executive board through contacts he had in Kista. He got funding for the start of Smarticware from Almi, Stockholm Innovation Center and a Vinn nu competition.

**5.2 Movinto Fun – Jin Moen**

**Background Jin Moen**

Jin Moen has a background as a researcher. She got her basic education during four years at the Royal Institute of Technology where she studied engineering physics with a direction against human computer interactions. She took during her time at the Royal Institute of Technology a break from the engineering studies for three years in order to take classes at the University Collage of Dance. Her PhD studies started in 2002 and she has a 4 years PhD in human-computer interactions. The PhD study was a part of the Royal Institute of Technology.
but the research was carried out at the Interactive Institute as a part of the graduate school Aesthetic Learning Processes at Stockholm Institute of Education. The interactive Institute is an independent research institute (owned by SICS, the Swedish Institute of Computer Science) that is devoted to IT projects with a more artistic nature.

**Movinto Fun**
Movinto Fun is a research based company that was founded in 2007 by Jin Moen and Marie P Björklund. The firm is for the moment developing a product called BodyBug. The product is based on Jin Moens research from the Interactive Institute and the Royal Institute of Technology. The BodyBug is an electronic ball that is constructed in order to interact with a person’s movement. The ball can perceive and register a person’s movements as it is attached around the body with a string. This makes it possible for the user to play different games with the BodyBug as he carries it with him. It is for example possible to dance together with the BodyBug. The Bodybug can further spot the presence of other BodyBugs and it will then make a chosen greeting sound similar to the signal of a mobile phone. Movinto Fun is for the moment in the developing phase of the BodyBug. The product is planned to be released on the market during fall 2008.

**The idea identification**
Movinto Fun is based on research that Jin Moen conducted during her time at the Interactive Institute. She did not at first realize that her research had business potential as her research background made that she had a researcher’s perspective instead of a business or entrepreneurial perspective. The idea to commercialize her research was awoken as she met a mentor through a mentor program for female PhD students at the Royal Institute of Technology. The mentor encouraged her to proceed with a prototype of her research that he believed had business potential.

**The idea development**
Jin decided to commercialize her idea as she realized that she through her research had created something that could have a commercial potential. She then took contact with KTH Innovation an agency at the Royal Institute of Technology that helps potential entrepreneurs to commercialize their research. KTH Innovation sent her to Innovation Stockholm at ALMI for counseling where she also got in contact with a number of developers in the area information technology. She was by chance participating in the event Stockholm Innovation Technology where she got into contact with STING that offered her a course in business for entrepreneurs without business experience. She took the course in Kista during the winter 2006-2007 which gave her a better picture of how the process of creating a firm looked like. Jin further participated in Venture Cup which Jin describes as useful as it enabled her to write a business plan. The Interactive Institute had at the same time moved their offices from another location in Stockholm to Kista. Jin met through the Interactive Institute her partner that together with Jin runs Movinto Fun. Her partner Marie P Björkman was in the board of the Interactive Institute and asked Jin how it was going with her research. Marie got interested in Jin’s idea and they together founded Movinto Fun in 2007. They decided to locate the firm in Kista as the Interactive Institute offered them rent office space for a very low cost. Jin mentions the cheap office space as the main reason for why they are located in Kista. Movinto Fun is for the moment in a preparation phase for the launch of the BodyBug during the fall of 2008. This means that they have arrangements for production, marketing and sales of the product. They have a letter of intent with a Norwegian producer of toys Simba Dickie Nordic
for the sales and the marketing of the BodyBug. An arrangement has further been signed with a consulting firm in Stockholm for the development of the BodyBug technique for Movinto Fun. The consulting firm is located all-around Stockholm and Jin got into contact with the firm through Kaj Mickos an advisor she had at Innovation Stockholm(ALMI).

Jin says that she cannot remember any special areas where she has been able to take advantage of Kista. She believes that if they maybe could get into touch with other firms that could help them if they just looked a bit around them but she believes that this is not necessary as they already have arrangements for the production and the launch of the BodyBug. She further argues that it is hard for them to have exchanges with other firms in Kista as Movinto Fun is a firm that are selling a consumer oriented product in contrast with most firms in Kista that are more oriented against business to business products. Jin argues that they instead have been using the network that they have had since before in the Interactive Institute and SICS. Moveinto Fun has been able to gather financing from different sources; Jin and her partner have financed the firm themselves from the start as well as they have been able to borrow money from Innovationsbron (a governmental agency). More financing have lately been arranged with business angels from their private network and they have finally been discussing financing with STING Capital.

5.3 Hulu – Patrick Lund

Background Patrick Lund
Patrick Lund is 41 years old and has a long career as an entrepreneur. He grew up in an entrepreneurial family and has therefore always been living in an entrepreneurial environment. Patrick has had his own company in different areas for 14 years now. He has before he started Hulu been active in media, real estates and service businesses.

Background Hulu
Hulu is a company located in Kista that was started in 2004 by Patrick Lund. The company is providing the market with solutions and products for wireless broadband that is based on technology standard called WiMAX. Hulu today consists of eleven people and out of these, nine are engineers. It is only Patrick and one other person that do not have their background in engineering. The company was in the beginning completely financed by Patrick but in 2006 other investors joined the company. Hulu has been entering the market with their products and it can be said that the company is a global firm as they do not have one single customer in Sweden.

The idea identification
Four years ago Patrick made an exit from a real estate company and decided that he would go on a six months long vacation. He traveled around Europe and South-America and during this trip he discovered that the wireless internet communication in many countries was very poor since the WiFi-hot spots did not work very well. Patrick also said that he realized that the need, especially in emerging markets, to build new infrastructure in a fast and cost efficient way would create a huge demand for a technology that could solve these problems.

The problem with the internet connections lead to that Patrick started to read about different technologies that existed in the area and thought that this was something that must be possible to come up with a solution for. Without any previous knowledge of the business sector he read about different standards and talked to friends and people he knew in this business. He
finally decided that the WiMAX standard was the standard with most potential. This lead to that he went home and started the company after only six weeks of his vacation instead of six months as planned.

The idea development
Patrick worked very hard in the beginning in order to create a strong brand around Hulu that would generate a interest for the firm. He wanted that Hulu should be considered as a pioneer in the field. Patrick further started to surround himself with engineers. The result of this has been that many engineers has contacted Hulu and offered them self to work for the company. “We work with a global infrastructure. To have the possibility to participate and build such an infrastructure does not happen that many times in the world history”. Patrick recognized that Kista have been a support in the process to create an interest and build Hulu´s brand. He states that Kista is a famous address that people all around the world recognize and that is something that has helped in the process to build Hulus brand.

The development of the idea has after Patrick’s initial idea been carried out by the engineers the company has hired. Patrick describes it as that he is the man with the innovative and creative ideas, and the engineer’s task is then to implement his ideas. The decision to be located in Kista was based on the synergic effects that they saw that the area could provide since all the big companies within this industry already was located in Kista and also the proximity to other institutions was important for the location. The proximity to other companies Patrick describes as both positive and negative. What is positive is that Ericsson, Intel or Nokia sit nearby Hulu´s office, it is then easy to go and talk with them when it is necessary. What is negative is that they have to be careful with what they talk about when they sit and eat lunch for instance, since it might be a competitor that sits next to them. Since they are working with radio technology it is according to Patrick a constant balance to say as much as possible to create an interest around the product and still keep it secret so no competitor takes it away from them. This informal information flow, or gossip, also gives Hulu knowledge about what technologies other companies currently are working with even if their official statements neglect the importance of the technology.

Patrick also said that the address in Kista was interesting because it is known outside Sweden and is sometimes called “the wireless valley of Europe” which gives legitimacy when talking to potential customers and investors, which is important since all of Hulu’s customers are located outside Sweden. In Patrick’s opinion the location in Kista is offers a clear benefit compared to other locations when the company is focusing on technology. Sales and marketing can be done just as good in the city center but Kista is a favorable location for Hulu as they are in a technology field and it is then necessary to be located in Kista. Hulu has finally been financed by banks, venture capitalists as well as they have received support from ALMI and Sweden’s Export Credits Guarantee Board (EKN). A part of the venture capital that Hulu has received comes from STING Capital.

5.4 Scint-X

Background Per Wiklund
Per is an engineer who started working with research and development within microelectronics for almost 30 years ago. He participated in a national program for the development of a national resource for the manufacturing of VLSI integrated circuits. In 1984 Per got employed at Ericsson and has experienced the fast technology development in the
microelectronic industry. When Ericsson wanted to make their engineers more business minded Per joined the education program provided by Ericsson and studied marketing and sales. During that time engineers was just focusing on technology and had never got any education in these areas. According to Per technology had a much higher status than selling during that time. After completing these courses Per went over to product management and product marketing and he also worked in Asia for Ericsson for some years. His last job at Ericsson was at the event department where he built mobile showcases for the future. When the IT boom was over and Ericsson went from 110 000 to 55 000 employees Per left the company and worked as a consult for some years before he started Scint-X.

**Background Scint- X**

Scint-X was founded during the year of 2007 in Kista. Scint-X had five founders and two of them are for the moment active in the company. The company is working with a technology called Scintillator which is a material that can turn X-rays into visible light. The structured Scintillator component Scint-X produces, which is made in silicon material, concentrates the reflected light which gives a high definition of the X-ray picture. By using this material, comparatively cheap sensors that in principle are used in normal digital cameras can be used to build X-ray detectors which make them more cost efficient. The main market the product is targeted for at the moment is in dental x-ray detectors which are a global market with possible customers all over the world. They have cooperation with an American firm that they for the moment are working on in order to formalize it.

**The idea identification**

The technology that Scint-X uses is based on research done by two professors who took a patent on the technology. They found a way to combine microelectronics technology with the Scintillator technology so the idea was not Per’s from the beginning. Per got in contact with the Scintillator technology through a friend that he had been working with. His friend had contact with the proffesors since his time at the Royal Institute of Technology and found out about the Scintillator technology. He did not himself have the time to take on the project and therefore asked Per if he was interested. The technology had at this time been further investigated by a Ph D student who did his doctorial work on the Scintillator technology with one of the professors as his supervisor. The result of the investigation showed that the technology had business potential. Per decided that the opportunity had enough business potential and decided to act on it. The patent was then acquired from the professors and Scint-X was founded.

**The idea development**

When the company started they lacked some competencies in the area. Per had run some small companies previously but never a limited company. However, since Per had worked with microelectronics previously it was not a completely new field. A newly graduated student from Uppsala University was hired in order to cover the aspects of the technology where they did not have enough knowledge. Scint-X has had a lot of help of Per’s network in Kista from his days at Ericsson. They have through this network been able to find companies which they have used for services. An employee with knowledge about sensors was further found through the network.” But we then missed some competence in sensors and then it was once again someone that knew someone. An then it was this guy who had been working as a consultant and he became very interested and came in after six months”. Per further stresses that it is very useful to be located in Kista as you can find everything in the area. One example
is that they use mathematical programs in their work and that it is possible to buy such programs. There is then a firm that works with mathematical programs that is located in Kista and Scint-X has had some contacts with them. There are further a lot of events that takes place in the area which gives him the chance to expand the informal networks but they are more focused on the mobile phone and wireless communication industry.

Infrastructure is however the main reason for why Scint-X is located in Kista. They rent cheap office space through STING which has been important as they for the moment have a limited budget. The proximity to the Royal Institute of technology and their lab Electrum lab is also very important. Scint-X rents the Electrum lab by the hour and can thereby have access to expensive equipment that is absolutely necessary for Scint-X in the development of the Scintillator. Per estimated that it would cost Scint-X around 50 million SEK to buy the machinery themselves, which would be impossible for a small company like Scint-X. The company has got its financing in form of grants from Vinnova and loans from Almi. Scint-X has finally been able to attract venture capital from Sting Capital.

5.5 Axiomatics

Background Babak Sadighi
Babak Sadighi is one of the founders of the company Axiomatics. Babak has his background as a researcher and has a Ph.D. from Imperial College in Decentralized Authorization Management. He is currently working both in his company and at the Swedish Institute of Computer Science (SICS) as head of the computer safety lab. SICS is a non-profit research institute in Kista which is owned partially by the Swedish government and partially the industry. Some of the owner companies of SICS are Ericsson, ABB, Telia, Saab and Green Cargo. Babak started working at SICS in the end of 90’s and has been doing research within the area he later started the company.

Background Axiomatics
Axiomatics was founded in 2006 by Babak Sadighi and his colleague Erik Rissanen who also was working at SICS. The company is providing security solutions which contain access and authorization controls for databases like patient’s medical records in the healthcare sector. This solution is based on a new security standard which protect information so it cannot be accessed by those who are not permitted to do so. Axiomatics today consists of three people but they are soon going to hire three more employees.

The idea identification
The idea generation Babak describes as an ongoing process that he has been working on for many years within his research projects. The idea was not something that just came up from one day to another. Babak realized early that he wanted to do his research about something that he later could commercialize and build a company around. The idea was not based on any obvious need from the industry that he had discovered by working there. He has not been working with the industry to satisfy some of their needs but rather working with research towards the industry. Since four years back they have been working with the standard that the solution is based on and during this time they have seen that the interest and demand for this solution will soon increase and therefore they decided to build their product on the standard. Since they not have been working as consults for the industry but come more from the research area Babak describes the process as more of a qualified guessing. Later they discovered that this work fit very well with the standardization process that was going on in
the industry and the market is now starting to grow quite fast. The company recently closed a deal with a large customer together with another company.

He said that the motivation to start a company has always been there for both him and for Erik who became his co-founder. The commitment to this process can be seen by the fact that after discussions between Babak and Eric about starting a company together, Eric applied for a education at the business school in Stockholm and studied there while he still was working at SICS since he became so interested by the idea of starting a company.

**The idea development**

Babak describe that the most important things for the development of the company and the idea has been economical issues and networks of advisors. The most important issue in the beginning of the idea development phase was to get financing in order to survive since it takes a long time to develop the product and also a long time to sell it. Axiomatics got some start-up capital by winning the Vinn nu competition arranged by the government organization Vinnova. The company also managed to get a loan from the other government organization Almi. This money helped them a lot in the beginning of the process and they could get a good start. Babak further mentioned that it was very helpful that the company could be located at SICS. Not completely free but still to quite reasonable costs. To have close relations with SICS is also considered to be a sign of quality for people both inside and outside the cluster.

Later in the development phase Babak says it is important to surround the company with competent advisors who can give feedback and help to sell the product. The company has an advisory board consisting of experienced people who has started their own company, lawyers, and people with expertise in other important areas. They also have got help from a business developer at SICS during the phase which has been helpful. But Babak also said that it is important to be careful and selective in the choice of advisors and not to involve too many people too early. Many of the people they have tied up to the company have been people they have in their close networks, both personal and professional.

Babak cannot say that he feels that Kista has given him something that he could not have got outside the area. He says that it can be a benefit to be located in the Stockholm region compared to smaller places because it is easier to set up meetings due to the proximity of companies and organizations. He however does not see any special benefits of proximity in being located in Kista. Axiomatics are further for the moment looking on facilities in other parts of Stockholm as they are planning to move away from Kista. Babak explained that the rents in Kista is currently among the highest in the whole Stockholm region, Stureplan in the city center is still more expensive but compared to other parts of the city it is expensive.
6 Analysis
In this chapter we analyze the empirical material and compare our findings with the theories presented in the theoretical framework. With the theories as starting-point we try to interpret what support the cluster have contributed with to the entrepreneur’s idea identification and idea development process.

6.1 Idea identification
Jin and Patrick were not located in Kista at the time when they identified their ideas. Moveinto Fun and Hulu can then be classified as new firms from the outside. We argued in the theory that it was likely that the entrepreneurs in new firms from the outside would not have gotten their ideas from the cluster environment due to that they would not have had much contact with the area. This can be strengthened by the fact that Patrick discovered his business idea when he was traveling around the world. He was not actively looking for an opportunity but discovered one anyway. It is very likely that Patrick’s experience as an entrepreneur helped him to identify the opportunity but this experience was not related to Kista as he did not have any contact with the area before he started Hulu. What makes Patrick’s identification different from the other ones is that he came up with the idea in a field that he had not been working with before. Jin was neither looking actively after a business opportunity, she was instead focused on her job as a researcher at the Interactive Institute. The source of Jin’s idea identification was instead her mentor that made her realize that her research had business potential. Jin’s idea identification was not related to Kista due to that the Interactive Institute was not located at Kista at this time and Jin thereby did not have any work related contact with the area. It can therefore be concluded that Jin and Patrick did not have any support from Kista in their idea identification.

Babak and Omid was both located in Kista before the identification of their business ideas. They were further very conscious and systematic in their search for business opportunities. The intention with Babak’s research was already from the beginning to identify a possible business opportunity. Omid was much in the same way actively working in order to identify business ideas which can be illustrated by that he during his time at Sonera Smarttrust managed to gather almost fifty ideas. Their active work in the search for business ideas can clearly be linked with Druckers theories that innovation comes into place through a conscious process. Babak’s research focus to commercialize a new product can be said to be a aim to find a new process need which also was inspired by changes in the market. Both further found their business ideas in areas which they had been working in for some time which indicates that they used knowledge that they had gained from previous experiences. This is in line with Shane’s argument that people use previously gained knowledge in their idea identification. These findings are however not on their own interesting for the study due to that they only tell us about the background to the idea identification. It is further necessary to link the gathered experience and knowledge to the cluster environment in order to clarify if the cluster environment in form of Kista has supported Babak and Omid in their gathering of experience and knowledge.

Babak’s idea was the result of his research at SICS and he stated that his network was related to the organization. He further got much of the necessary experience in his field from SICS while his companion acquired business experience from Stockholm School of Business. Their research background and the fact that Axiomatics was founded as a result of their research

152 Drucker, “The discipline of innovation”
153 Shane, “Prior knowledge and the discovery of entrepreneurial opportunities”
make the company to an institutional or university spin-off. SICS was located in Kista which indicates that Babak got support in the idea identification process from Kista. It was described in the theory that spin-off entrepreneurs might have a feeling of greater support from the environment in the idea identification.

Universities and organizations are a good place where an entrepreneur can acquire the knowledge and experience that he needs in order to identify a business idea. The concept of the entrepreneur as an organizational product that provides the entrepreneur with industry knowledge and social ties in form of networks could be factors that gives the entrepreneur valuable knowledge in order to identify business ideas. Babaks research organization SICS was further described as the result of a triple helix cooperation since it is owned by the state and the industry. The fact that Babak was located in Kista could as well have provided him with a network in the area that could have been a support in the identification of his business idea. Axiomatics is a spin-off from SICS which confirms the importance of organizations for entrepreneurs in their idea identification. SICS gave Babak the possibility to work on his research during a long time which ended up with that Babak and his companion founded Axiomatics. It can thereby be concluded that SICS has been an important factor in Babaks idea identification as the organization supported Babak as they contracted him as a researcher.

It can however be questioned if this support is linked to Kista as an environment. Babak did not feel that Kista as an environment had been giving him something special that he could not have gotten anywhere else. The idea identification was further a process based on research where they where guessing which research areas that in the future would have most potential to commercialize. This indicates that they did not have any significant contacts with the market in form of the industry. It thereby seams as that Babak had most contacts within SICS and the research world. We therefore argue that Babak got the necessary knowledge from SICS without any contacts or exchanges of importance in Kista apart from SICS. Babaks idea identification would thereby more be a result of his experiences and networks in SICS which can be illustrated by that Axiomatics is a spin-off from the organization. This is interesting as it indicates that being located in a cluster environment do not instantly mean that an individual or entrepreneur are interacting with other individuals in the environment.

Omid had a background in Kista where he had been working for several companies in different positions. It can thereby be argued that he was able to gather much of the necessary experience that enabled him to identify the business idea through his different works in Kista. This makes Omid to an organizational product and it might be that he gained much of the necessary experience to identify his idea in Kista. The identification of the idea that lead to the creation of a Smarticware can be related to his working tasks in Sonera Smarttrust where he was working when he identified the idea. He was in Sonera Smarttrust responsible for the Smartcards and saw their limitation in form of low memory. It can therefore be concluded that his work at Sonera Smarttrust was the source of his idea. The identification would thereby not have been possible without his work at Sonera Smarttrust which makes Smarticware to a corporate spin-off. This indicates that it is possible that his past experiences in Kista have been of importance for Omid in his idea identification as well as Sonera Smarttrust was the source of the idea. We however relate Omid’s idea identification mainly to his personal characteristics and his diverse background. Omid described himself as an ingenious person and further explained that he had a divers study background that with many courses within different fields that enabled him to combine different areas of knowledge. He was further very conscious in his work to identify ideas which can be illustrated by that he was able to gather almost fifty different ideas. We therefore argue that his work at Sonera Smarttrust was crucial
for his idea identification as it was the source of his idea, it might further be that Kista has supported Omid in some way in his idea identification but the main reasons for the idea identification was his personal characteristics and his background where he had knowledge in many areas. It would however have been interesting to include all the ideas that Omid generated in the study. It might be that the majority of his ideas that he have not been going through with was very influenced by Kista.

Per did not identify the idea himself, he instead got in contact with the idea through a friend that he had worked with in Kista. The friend had contact with a professor at the Royal Institute of Technology that together with another professor had developed the Scintillator technology further. This illustrates that the network was essential for Per in his idea identification which shows the importance of networks for entrepreneurs in their idea identification. It was Per’s network that provided him with the business opportunity. Per’s network was strongly related to Kista due to that he had been working in the area for a long time. The foundation of Scint-X was thereby a result of that knowledge was moved between individuals in Kista through the networks, which they had been building during a long time.

This can be related to the theory as it can be argued that Per’s use of his network can be an illustration of knowledge flow that took place in Kista as a result of that Per was a part of a network of untraded interdependencies. The process of the knowledge flow required that Per had the necessary knowledge to understand the idea, he had further developed social bounds to a person that he previously had been working with. This bounds lead to that his friend had enough trust to communicate the idea to Per. The transfer of the Scintillator technology can furthermore be seen as that knowledge was moved between two communities of practice as a result of social interaction. It can thereby be concluded that Kista offered Per support in his idea identification in combination with cluster theories in form of untraded interdependencies and knowledge flow as Per’s network was related to Kista.

6.2 Idea development
Both Babak’s and Jin’s business ideas are based on research that they have conducted; they can thereby be categorized as university or institutional spin-offs. This as we have described earlier do not necessarily have to tell us anything about their interaction with the cluster environment. It is however of great importance in both cases due to that Babak and Jin have had a lot of support from their research organization in their process to develop their business ideas. Both have been able to hire cheap office space in the office of their organization and they mention this as the most important argument for why they located their firms in Kista. The support they have gained from Kista in their idea development can however be questioned due to that they do not consider that they have been able to contribute from being located in Kista apart from the cheap office space that they rent. The rented office space is a result of their contacts with their research institutions and not a result of any interaction with other organizations in Kista. The only support we have identified is the start up course arranged by STING that Jin took in the beginning of her development process which helped her to understand certain business elements better. She thereby received some basic support from an organization in Kista. The advisory board that Babak has tied up to the company can mainly be related to SICS. Babak further stated that he believed that Axiomatics had gotten higher credibility from their link to SICS, he did however not believe that they had gotten higher credibility from Kista. Babak’s indifference for the location of Axiomatics can finally be illustrated by the fact that they are moving away from Kista. It can thereby be concluded
that they have not benefited from any significant support from Kista as an environment in their process to develop their business ideas. They have instead been given crucial support from their research organizations which can be explained by that they are using their old networks that they acquired in their research organizations. This further indicates that an entrepreneur’s location in a cluster not instantly means that he/she receives support from the cluster environment.

Per as Babak and Jin sees the cheap office space that he hires at STINGs incubator as an important reason for being located in Kista. The main reason for why Scint-X is located in Kista is however that they have the access to the Royal Institute of Technology’s research lab which is necessary for them in order to develop and commercialize their product. This shows that Scint-X have been able to benefit from Kista as a location due to they have been provided with specialized inputs in form of a research lab. Parts of the funding that Scint-X has been able to raise are further connected to Kista and STING capital. It can thereby be said that Kista has provided Scint-X with an easier access to venture capital. Per further stated that he used his old network from his time at Ericsson in his work with Scint-X. The network is very much related to Kista as Per worked at Ericsson in Kista during a long time, Ericsson’s head office is further located in Kista. Per’s network have given Scint-X the possibility to get in contact with a number of firms and experts located in Kista but also in other locations in Sweden. It can therefore be said that Per has been able to benefit from his contacts in Kista but that they have their most important contacts outside of Kista. This can be exemplified with that they have collaboration with an American firm. Kista as a location was however the source of the network due to that Per got to know many of the persons in the network in Kista. Scint-X was finally able to recruit one employee through Per’s network in Kista and it can thereby be argued that Kista to some extent has been able to provide Scint-X with skilled employees. The recruitment process can further be described as a result of that Per was a part of the untraded interdependencies in Kista from which he could benefit in his search for an employee.

Patrick worked very much in the beginning in order to create a strong brand that positioned Hulu as pioneers in their field. This created an interest around Hulu that enabled them to recruit employees since engineers contacted him and offered their services. Patrick’s opinion was that Kista as an area facilitated this work due to that it was possible for a company to get a higher credibility with an address in Kista. The location in Kista has further facilitated in the contact with customers for the same reason. This indicates that Kista as a location has supported Patrick and Hulu as they have been able to benefit from a higher credibility that is linked to the cluster. This can further be linked to the theory and Porters complementaries as it seems that Kista as an area has built a reputation internationally. Patrick was able to benefit from this reputation as he stated that it was an advantageous to have an address in Kista. This indicates that an areas reputation can give entrepreneurs support in their idea development process. Patrick further saw the proximity to other firms as very positive for the development of the product as he easily could get the access to the major companies in the wireless business that are located in the area. This gave Patrick the possibility to discuss issues related to the development process with other people in the business. He moreover described it as that he could benefit from a synergy effect as all major institutions and public goods was located in Kista. Hulu finally used a network that they had in the area, Patrick had been able to increase this network as he used contacts that his engineering employees had since before in Kista. This shows us that Patrick has benefited from many of the factors that Porter describes as significant for a cluster environment. Especially the access to institutions and public goods are coherent with Patrick’s story as well as the easy access of information. Some of the
information was also of the character that it requires a close relation with people working in the area which also is facilitated by the location. The fact that he could get this information indicates the importance of untraded interdependencies that can be obtained in a cluster environment. Patrick has also been able to find venture capital which indicates that it can be easier to get financing in a cluster. We therefore argue that the cluster environment has supported the idea development in several ways that would not have been possible outside Kista.

Omid was very conscious from the beginning about that it was necessary for him to locate Smarticware in Kista. He argued that Kista as a location was a part of the business culture in Smarticwares field. It would in Omid’s eyes have been a disadvantage to not be located in Kista as it would have given him less credibility. Omid’s assumptions are here very much in line with Patrick’s and the statement that Kista is a part of the business culture thereby support and strengthen the theories that argues that a cluster environment can give new firms legitimacy and a higher credibility. The statement that Kista is a part of the business culture further strengthens that Kista’s reputation can help an entrepreneur in the development process of his idea.

Omid actively used his network in Kista, a network that consisted of people he knew from his time at Chalmers as well as of new individuals that he had got into contact with in Kista. He emphasized that the proximity between individuals in Kista contributed to his development process as it facilitated exchange of information. This exchange of information was related to specific problems that Omid was able to get help with from experts that he knew through his network. He described this process as faster and easier due to the proximity and it was furthermore available for free. Omid was finally able to get in contact with important person through his informal network which was a result of that his employee used to smoke outside of their office. It can be concluded that Kista supported Omid in his idea development process as the area gave him the access to complementaries in form of a collaboration partner that was important in his work to standardize the digital European passport. He further got support in form of access to specialized inputs as he got help from a number of experts.

All this support is based on the extensive network that Omid had created in Kista. The network lead to that Omid was engaged in a number of informal contacts that helped him in his work. It can clearly be concluded that Omid was a part a network of untraded interdependencies. Omid used his knowledge in his field in the interaction with the experts and he could get access to them due to that the experts knew him and could identify themselves with Omid. It can thereby be said that they shared a common background. The proximity was here crucial as it facilitated the interaction due to that Omid could meet the experts within a short time. Omid was finally able to get support from an incubator in form of the office space that STING offered him in their facilities. All this in total shows us that Omid has had support from the cluster environment through his process of identifying and developing the ideas.

6.3 Summarizing Analysis
It can first be concluded that many of the elements from the cluster theories have had an impact on the entrepreneurs during their idea identification and idea development which makes it possible to conclude that entrepreneurs can get support from cluster environments in the process to identify and develop business ideas. Kista offered Omid, Patrick and Per high amounts of information which Porter argues is an element in a cluster. It can however be
concluded that the available information was more related to the idea development than the idea identification expect in Per’s case.

A cluster can according to the theory offer entrepreneurs several possibilities for business opportunities this was not strengthened by our investigation. The investigated entrepreneurs’ ideas were not based on any gaps in the production in the cluster environment of Kista. All the ideas where instead based on a global market and the firms intentions are to sell their products all over the world. This excludes other possible sources for ideas such as those new ideas would have been based on the supply of certain special goods that there are demands for in the cluster environment.

We further discovered that some of the firms had collaboration partners in Kista but it was more likely that they also had collaboration partners located outside of Kista in Sweden our another country. It was not mentioned that they had any suppliers in the area which indicates that Kista did not support the entrepreneurs with specialized suppliers. Access to specialized employees was another of Porters elements and it can be said that this was not an important factor. The firms did not mention that they requited any large amounts of employees from Kista apart from that Per told us that he found one specialized employee in Kista. It might however be that this is something that will be an important element later in the development process for some of the firms. Movinto Fun had for example no employees yet, Scint-X is further in a very early stage of their idea development and it might be that they later will find skilled employees in Kista if they succeed with their ideas and expand the company. Kista offered the entrepreneurs a higher credibility as the area had built a well known reputation internationally which was emphasized by Patrick and Omid. This supports the theories that argue that a cluster environment can give entrepreneurs higher credibility. It is further a support for one of Porters element of complementaries that argues that the firms in a cluster together create a reputation around the area which can attract customers.

We did however not find any support for the other two categories of complementaries; collaboration in the production of new products and collaboration with products in order to meet customer needs as there was no indication that any of the firms where involved with another firm in Kista in such a collaboration. None of the entrepreneurs mentioned that they had any plans for such collaboration. The access to institutions and public goods in Kista was highly valued by all the entrepreneurs as Babak had access to SICS, Jin to the Interactive Institute, Patrick mentioned it as important, Per had his office in STINGs incubator and used the Royal Institute of Technology’s research lab. Omid was finally located in STINGs incubator in the beginning when he started his work with Smarticware. It can however be said that Babak’s and Jin’s access to their institutions was not related to Kista due to that they had backgrounds in their organizations as researchers. This is interesting as it indicates that spin-offs in cluster environment do not have to be linked to the environment in itself as Babak and Jin only benefited from their research organizations and not from Kista as a cluster.

It seems as that cluster environments can offer entrepreneurs better access to capital in their idea development process. Hulu and Scint-X received venture capital from STING capital and all of the firms have been able to get investments. It is however only the venture capital from STING capital that can be linked to Kista as an area as the other organizations that supported the entrepreneurs with capital where nationwide organizations with all of Sweden as their base. It can however be that their location in Kista has facilitated in the search for capital but this is nothing that our results can support. Proximity to customers was further an element that was mentioned in the theory as something that an entrepreneur in a cluster environment could
benefit from. We could not find any support for this due to that all the investigated firms where working with global products for global markets. A cluster was finally supposed to offer entrepreneurs the access to specialized inputs. We found evidence of this in Kista as Per used the research lab at the Royal Institute of Technology which is a form of specialized inputs. Per’s access to the Royal Institute of Technology is also another support for that a cluster offers better access to institutions and public goods. Omid had further the access to another form of specialized inputs in form of experts through his network.

Omid’s access to specialized inputs is interesting and lead us in to the next area of the theory the untraded interdependencies. Omid’s contacts with the experts where not formal but informal and a part of his network in Kista. Omid’s story gives us a good picture of how untraded interdependencies can support an entrepreneur in the development of business ideas. Untraded interdependencies are something that exists in Kista and Omid was a part of an extensive network of individuals that exchanged information and knowledge which was of great support for Omid. Omid was further able to get access to important key persons through this network of individuals. The importance of untraded interdependencies is further strengthened by that Patrick had the access to a lot of information through informal contacts which was facilitated by the proximity in Kista. The untraded interdependencies were finally essential in Per’s idea identification as the business idea was identified through informal contacts that he had in Kista. The theory further says that it takes time to develop untraded interdependencies which can be illustrated by the study as Omid and Per have been active in Kista for a long time. Patrick further has some history in the area now as he started Hulu in 2004. He was finally able to get into the area faster through employees and people that he knows that facilitated.

What is interesting with the untraded interdependencies is that it seems like Babak and Jin where not integrated in Kista. This despite that Babak had been working in SICS since the end of the 90’s. We argue that this indicates that untraded interdependencies not are something that one just becomes a part of. It seems as it is necessary to make an effort in order create a network that can assist in the work. This argument can be strengthened by the theory of communities in practice that emphasizes that an individual becomes a member of a community through interaction. It is further through interaction that learning and knowledge exchanges takes place which indicates that a person that not seeks interaction will not be able to benefit from available knowledge in a cluster environment. Omid compared to Babak knew many individuals in Kista from his time at Chalmers and he stated that he all the time meet knew important people in the area which indicates that he was actively searching for interaction with other individuals.

Babak and Jin are interesting as they are spin-offs from research organizations that can be said are the result of Triple helix collaboration. A triple helix is supposed to create more innovation by collaboration between state, industry and academia when people with different knowledge can interact. That is Babak and Jin should according to the theory be a part of an interaction between the state, the industry and the academia. It can also be said that they are a part of this interaction but the interaction is not related to Kista as a location. This indicates in our eyes that the triple helix collaboration not have reached its full potential in Kista. Our findings suggests that the Triple Helix collaboration that exists in Kista between SICS, the Interactive Institute, the state and the industry more is of a second level nature. The organizations are in Kista working very independently from the state and the industry since Babak said that he worked towards the industry and not with them which fits better into the model of triple helix two. It does on the other hand seem to exist a triple helix collaboration of
the third degree if we take our eyes from Kista to the Stockholm Region. It can further be argued that both Babak and Jin is interacting with both the industry and the state as they have founded firms which makes them a part of the industry with a background in the research world. Babak and Jin have also been involved in collaborations with the state as Jin for example has been able to get support from Almi. We can however not say that the support that Babak and Jin have received from the Interactive Institute or SICS is the result of an existing Triple Helix collaboration of the third degree in Kista. The support has in Kista instead been much linked to each organization and their resources. This is interesting as the majority of the studies in the cluster field have been conducted with an organizational or firm perspective. The spin-off concept was further criticized in the theory due to that it only involved the parent organization in the concept. Our findings suggest that it is possible to go further in the criticism of the use of the spin-off concept in the cluster field. We argue that it is not possible to automatically conclude that a spin of firm or entrepreneur has received support from the cluster environment. Our investigation instead shows that it is very likely that a spin-off firm has received support only from the parent organization and not from the environment.

We can finally from our analysis of the idea identification and the idea development conclude that Kista played an important part in the idea identification for one of the five entrepreneurs. The area has further been able to offer support during the idea development to three of the entrepreneurs. This makes it possible to conclude that cluster environments can offer entrepreneurs support both during the idea identification and the idea development. Our findings however suggest that it is more likely that an entrepreneur will receive support from the cluster environment during the idea development. It can further be concluded that the form and amount of support that the entrepreneurs received from Kista differed very much between the entrepreneurs. This is in line with our assumptions that every entrepreneurial process to identify and develop business ideas differ very much between every idea and every entrepreneur.
7 Discussion

In this part we discuss the result of this and the reflections we have made during the thesis work.

We wanted to study how the cluster environment supports entrepreneurs in their idea identification and development process with the theoretical base in Porter’s cluster theories. The study has provided us with some interesting issues to develop a discussion around. It can be said that many of the elements that they theory points out as an environmental support in a cluster can be hard to interpret due to that it can be hard for the entrepreneurs to see and observe them when they are in the middle of the process to develop their business ideas. It might be that the occurrence of untraded interdependencies and the creation of informal networks where knowledge can be shared and used to build up the individual’s knowledge pools is not something that is recognized as support by the entrepreneurs. They might instead take it for something normal for every geographical area and not relate it to Kista. It is here interesting to discuss the differences in entrepreneurial experience between the entrepreneurs. Patrick for example had experience of doing business outside the cluster and it might be that he therefore saw the benefits of being located in Kista clearer than Babak or Jin that was working on their first company start-up. It is further interesting to discuss Babak and Jin due to that we found out that Kista not has had any impact on their idea identification or idea development. Both Babak and Jin had companions, Babak already from the start and Jin met her companion during her work with Movinto Fun. We have not been able to study their companion’s opinions about Kista as an environment. It might that the companions had a lot of informal contacts in Kista and that they benefited from the environment more than Babak and Jin did. It would therefore be interesting to make a deeper study that covers more individuals that are involved in the process to identify and develop business ideas.

Babak and Jin are further interesting as they are spin-offs firms who according to the theory should get a lot of support from the environment. We however could only relate the support to their organizations and not to Kista which made us criticize the use of the spin-off term in the cluster research. It is often taken for granted that a spin-off firm have had support from the cluster environment if the firm is created in the cluster. This might be an implication of that most studies in the cluster field have been macro studies that only have observed the number of spin-offs and then automatically related their emergence as a result of that a cluster offer entrepreneurs support. We argue that our results shows that it in the future is necessary to go deeper into the process of idea identification and idea development in order to make clear which support that is an outcome of the cluster and which support that only is related to the parent organization. This could contribute with valuable information that could help policy makers to create strategies that can increase the exchange between research organizations like SICS and the surrounding cluster environment.

It further seems like entrepreneurs located in cluster environments not automatically starts to interact with the environment. It might be that the interaction depends very much on personal characteristics. Babak and Omid had both been active in Kista for a long time but our study indicates that Omid had more extensive network in the area that he was relying on more in his development process compared to Babak. This might partly be explained by that Omid had been moving between different organizations in Kista before the foundation of Smarticware but it might as well be that he was searching more consciously after interaction. It might on the other hand be that Babak got all the necessary support from SICS and thereby not had a need to interact outside of the organization. One final issue here is that we have been making a study about individual entrepreneurs in a cluster setting where we have been looking for
elements that support the cluster theories. We have had the assumption that it is beneficial for entrepreneurs to interact and create networks in the cluster etc, but it might be that this is not important for every entrepreneur. We have further argued that every start-up process has its own characteristics. It can therefore be argued that it do not exist any right or wrong answer for how an entrepreneur should act in their idea identification or idea development. What is important is instead that the entrepreneur finds a way that can lead to success for him and his firm. Omid’s way to success was through interaction in Kista while Babak has found another way where he interacts more in his research organization. We believe that both Babak and Omid has found good ways to work as Omid has been able to build up a prosperous firm in Smarticware and Babak is on his way with Axiomatics.
8 Conclusions

In this chapter we look back at our research objectives and present our conclusions. We will here give an answer to the research question that was: How do cluster environments support individual entrepreneurs in the process to identify and develop business ideas? The conclusions will end up with suggestions for future research in the area.

- The result of the study shows that cluster environments can offer entrepreneurs support in many different ways during the process to identify and develop business ideas. All the entrepreneurs did however not benefit from support during the idea identification or the idea development.

- It is further possible to conclude that the support was stronger during the idea development process as many of the entrepreneurs where located outside of the cluster when they identified their ideas.

- The support that we found in the idea identification could be linked to the existence of untraded interdependencies, informal contacts and knowledge flow that provided one entrepreneur with information about a business opportunity.

- The support that we found in the idea development could be linked to the existence of untraded interdependencies that provided the entrepreneurs with the access to information, knowledge and experts through networks. The cluster further offered an access to specialized inputs, institutions and public goods such as incubators as well as it can be concluded that a cluster can provide an entrepreneur with a higher credibility due to the reputation that a well known cluster creates.

- It was finally shown that the support that a new spin-off firm gets cannot automatically be linked to the cluster environment. The support could instead only be linked to the parent organization from which two of the entrepreneurs received support.

8.1 Future research

We suggest two areas that we find interesting for future research in the area. We first argue that it is necessary to further investigate the use of the term spin-off in the cluster research area. We therefore advertise for a study that more closely straightens out the support that entrepreneur gets from the parent organization respectively the cluster environment when new spin-off firms emerge in cluster environments.

New firms are further many times founded by more than one person. One limitation to this study is that we only have investigated one entrepreneur in every firm. It might be that we therefore have missed valuable information as the co-founders might have gotten support from the cluster. We would therefore in the future like to see an observation study that includes more individuals and aspects that affects the idea identification and idea development in a new firm. Such a study can approach the entrepreneur or the entrepreneur’s interaction in the cluster from more angels. We argue that this better can clarify the interaction that takes place in network as well as it better can describe the resources that an entrepreneur has access to in a cluster environment.
9 Credibility Criteria
In this chapter we discuss the credibility, dependability and practical applicability of this study.

9.1 Credibility
Credibility in a qualitative research is to give the reader a trustworthy empirical description of the social reality that we have been studied.\(^\text{154}\) As we earlier described the interviews were recorded and transcribed directly afterwards. The empirical presentations of the interviews have been sent to the respondents. By doing this we have given them the chance to comment if we have interpreted and presented their answers correctly. Some of the respondents gave us some comments with information to add since they thought it was necessary for the description of the process. None of the respondents wanted us to remove any parts from the presentations. Therefore we argue that we have been able to describe the reality in a fair way for the reader and thereby reached the criteria for credibility of the study.

9.2 Dependability
In order to reach dependability it is important for the researcher to describe the working process to make it possible for the reader and other researchers to audit the study.\(^\text{155}\) This has been done continuously during the work with this thesis. We have in the theoretical method described our preconceptions and argued for our choices of research method literature and sources and also our epistemological view on the results. Further in the practical method we have described the data collection process by arguing for our selection of respondents and how the interviews have been conducted. The supervision during the thesis work has also helped us to look at these choices critically during the process and we therefore argue that the dependability of the study has been ensured.

9.3 Practical applicability
The question of practical applicability we discussed already in the theoretical method in terms of transferability to other clusters. We can conclude that we have reached the ambition that these results can be practically useful for politicians and other actors in cluster environment. This because the study has increased the understanding for what support a cluster environment can offer entrepreneurs in their idea identification and development process. The findings can be used in order to improve the environmental support for nascent entrepreneurs in other technology clusters where the conditions are similar to our study.\(^\text{156}\) In the discussion we pointed on several questions that have arisen during the process which can make this study to act as a starting point for coming researchers who are interested in clusters and entrepreneurship.
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