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SCHOOL OF BUSINESS, ECONOMICS AND LAW

Master Degree Project in Knowledge-based Entrepreneurship

Knowledge transfer in collaborative research

A case study of the development of firms' capabilities for innovation in
collaborative research

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By

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Abstract

This study is based on a collaborative research project between ten industry partners and two universities. The aim of the project is to develop a new material that will hopefully replace existing solutions in the market that is less environmental friendly.

The purpose of this study is to investigate how knowledge transfer could stimulate and lead to firms' development of capabilities for innovations. In this thesis a qualitative approach was chosen in order to answer the research questions. This study is based on an perception and assumption that if knowledge was transferred in a more effective manner within the collaboration, the partners would benefit in their development of capabilities for innovation.

To enhance the transfer of knowledge the project should create a dynamic and flexible structure where the partners is given the opportunity to interact and share experience. By creating an environment that enables the partners to meet with each other in an informal manner more knowledge and ideas might be created and shared. These informal and dynamic environments will also be good opportunities for the partners to share their motives by each other. It might be found that some of the partners possess valuable knowledge that would help the project to proceed, this will give the partners the feeling of contribution which will also enhance their commitment to the research progress. Increased interaction between the partners would led to that the partners will get to know each other more. By building trust between the participants will open up for confidence in each other's capabilities and ideas for how knowledge can be combined and used in new ways.

Keywords: University-industry relationships, collaboration, collaborative research, innovation, knowledge transfer



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1. Introduction

1.2 Background

Innovation generates opportunities to growth and development. Innovation management have therefore become a concept that is important for companies and universities to master. Research highlights the importance for firms to have the ability to perform both internal and external R&D activities, when aiming to create a greater value from innovations.. (Soh, P-H., A M, Subramanian, 2013) External resources will reduce both the cost and time of technological development (Rothwell, 1994), and are valuable sources in the development of innovation when an organization does not hold all of the necessary parts of the value chain in-house (Chesbrough 2006). Universities is a commonly used source of innovations that companies turn to in need of knowledge and resources. (West & Bogers, 2013) Relationships between industries and universities have a long history in research, and have been studied from many different perspectives and areas. From a literature review based on studies of industry-university relationship four categories of topics have been identified. These are; firm and university characteristics, geography in terms of localized knowledge spillovers and channels of knowledge transfer. (Agrawal, 2001)

In literature academic engagement is defined as “*knowledge-related collaboration by academic research with non-academic organisations*”. This engagement could include formal relationships between firms and universities in collaborative or contract research, or more informal terms such as networking. (Perkman, 2013) The development of innovations is dependent on new knowledge as the creative process includes defining and solving of problems, therefore firms need to search in their external environment to find knowledge that will complement their competences. (Nonaka, 1994) Collaboration between different actors is in that manner an interesting area to study as it is considered an mechanism for knowledge transformation, where the participants learn from each other. (Caloghirou et al., 2004)

Interaction between organizations and individuals is a crucial step in the process of knowledge transfer. Thus, to be able to learn new knowledge from others certain aspects need to be

considered. (Nonaka, 1994) Cohen & Levinthal (1990) have developed research in organizations ability to recognize valuable informations and knowledge, and how to apply it to commercial purposes. They refer this ability to “absorptive capacity”, which is a crucial ingredient for organizations in their development of innovations. (Cohen & Levinthal, 1990)

In collaborative research different partners are working together with a mission to develop a certain type of research. However, the motives or objectives that the partners aim for differs as they have different needs. Organizations can benefit from the collaboration in many ways, both from the research outcomes that can be used in future product development. But also by learning and get knowledge from the other participants, which could develop a firm's internal capabilities. Learning and knowledge transfer is a complex process that is dependent on different factors and steps that needs to be managed in order to benefit from the transformation. (Gilbert & Cordey-Hayes, 1996)

This study is based on a collaborative research project between ten industry partners and two universities. The aim of the project is to develop a new material that will hopefully replace existing solutions in the market that is less environmental friendly. The potential innovation is planned to be applied in different industries and markets such as food, packaging and sanitary products. The partners involved represent different industries and possess different roles in the value-chain. The common experience and knowledge within the project will hopefully bring out successful research and develop valuable innovations.

1.3 Problem discussion

The obvious outcome or result of a collaborative research project is any type of innovation, for example product- , process-, service innovation or improvements of existing innovations. Thus, a project does also have an indirect route to innovation which is generated from another type of outcomes. Compared to the obvious outcomes, these outcomes are intangible and have an impact on organizations’ capabilities and learning. These developed capabilities can further on generate innovations. (McKelvey & Ljungberg, 2014)



Commercialisation and research performance, such as patents and publications, is a commonly used measurement when studying the impact that is generated from a university-industry relationship. (Markman et al., 2008). Thus, literature suggested that more attention should be focused on the multiple other ways in which university research could be used. “Academic engagement” is defined as “knowledge-related collaboration by academic research with non-academic organisations”. This engagement could include both formal, such as collaborative or contract research, and informal activities, such as networking. (Perkman, 2013) By studying the intangible outcomes that is the result of collaborative research and academic engagement, more knowledge in the field of how firms development of capabilities for innovation will be gathered. (McKelvey & Ljungberg, 2014)

1.4 Purpose

The purpose of this study is to investigate how knowledge transfer could stimulate and lead to firms’ development of capabilities for innovations. The idea for this topic was raised from an interest to investigate what “happens” with the knowledge within a collaboration, how the knowledge is transferred and learned by the participants in the project. The case used in this study is a collaborative research project which involves both industry partners and universities with extensive knowledge and expertise in different areas. Thus, that is not an obvious reason for knowledge within the project to be properly used in order to bring out innovations. If the knowledge is not shared and learned between the partners great opportunities might be lost. By explaining the importance of knowledge transfer within collaborative research and how this process can lead to firms’ internal capabilities to create innovations, the interest and attraction to these type of project and collaborations will hopefully increase.



1.5 Research questions

The research questions that this study aims to address and answer are;

- *How could firms' capabilities for innovation be developed from knowledge transfer in collaborative research?*
- *Which factors have impact on the knowledge transfer process within a collaborative project?*
- *What implications can these factors have on the case project?*



2. Method

Below follows a presentation of how this study have been designed and performed. The study is based on a qualitative approach where a collaborative research project have been studied as a single case study.

2.1 Research strategy

The methodology aims to describe how the research questions was answered and how the study have been executed. In this thesis a qualitative approach was chosen in order to answer the research questions. The perspective of this approach is focusing on the participants, instead of highlighting the point of view of the author. This approach have also been appropriate since the study aims to understand the values and behaviours of the participants, in terms of the context in which the research was conducted. (Bryman & Bell, 2011) Compared to a quantitative approach which rather deals with statistical analysis, explanation and testing of hypothesis. (Eriksson & Kovalainen, 2011)

The first step of a qualitative research process is usually a definition of general research questions, which was also the starting point of this study. Next in the process is selecting relevant sites and subjects followed by collecting of relevant data. In this research a case, in terms of a research project, was chosen and investigated. The data was collected from interviews made with the members of the case project. The empirical findings is analysed and compared with existing literature that have been reviewed. The last steps of the qualitative study is to further specify the research questions and if necessary collect more data, and lastly write up the findings and conclusions. (Bryman & Bell, 2011)

The relationship between research and theory in this study is based on an abductive approach. There are two different models that qualitative research use when generating knowledge, these are deduction and induction. The approach that is used for this research is a combination of these two and is referred to as abduction. (Eriksson & Kovalainen, 2015) The abductive approach enables the researcher to move back and forth between literature and the empirical data that is



collected, when analyzing the results of the study. (Bryman & Bell, 2015) This approach gave the research process the flexibility needed to answer the research questions.

2.2 Theoretical approach

In order to develop and investigate a research idea it is important to be aware of the current knowledge in the chosen topic area. It is also required to demonstrate an ability to evaluate these theories and existing knowledge critically. (Eriksson & Kovalainen, 2015) The purpose of the theoretical approach in this study is to create an understanding of the research topics that this study is build on. To investigate what literature that already exists and see if there are any undiscovered areas in this field. The aim of the study is to develop or redefine existing theories. These theories will work as a guideline along the research process, and be compared and analyzed my findings. From the literature review four factors have been identified that the study is build upon. These factors are also used in the analysis where finding and existing literature is compared. The search for existing literature have mainly been done through internet by using databases that have been reached from the university library. The theoretical frame is mainly built on published research articles. Key words that have been used for the search is innovation, innovation management, collaborative research, capabilities.

2.3 Empirical approach

This study investigates a collaborative research project and the different organisations and participants involved. The research is based on a case study, with the research project as single case where data is collected from interviews with the different members of the project.

2.3.1 Case study

A single case study is relevant method when seeking to explain present circumstances and social phenomenons. The case study enables the researcher to get more in-depth understanding of the objects being studied. (Yin, 2014) This study is based on an ongoing collaborative research project. The members of the project is both partners from the industry, employees from two different universities and represents from a research institution. The industry partners are



represented of both large and small companies from different industries, with different competencies and expertise. The chosen case is an interesting example of a collaboration where the mission is to invent a new type of material. The diversity among the different partners involved, and the complexity in the research that the project aim to succeed with, makes this an interesting case to investigate, and a good target when answering the stated research questions.

2.3.2 Semi-structured interviews

The empirical data have been collected from 9 semi structured interviews with partners both from the university and the companies involved. Semi-structured interviews gives the interviewer freedom and flexibility to modulate the interview while it is being performed, yet the prepared material helps the interviewer to stay in relevant topics. (Bryman & Bell, 2011) Before the interviews was made a range of questions and topics was prepared, yet no specific order for the questions was followed and many unprepared questions and topics was discussed during the interviews. The aim was to interview at least one represent from each organisations involved in the project. Unfortunately three of the companies involved was not interviewed because of practical issues. However, the interviews that have been done have given the study enough data to perform an extensive analysis. The interviews was performed by phone or on the location of the interviewed organisation. The table below present an overview of the performed interviews.

Organization	Time and place	Duration
University I	2016-03-30, Location	0 h 50 min
University I	2016-04-01, Location	0 h 45 min
IP1	2016-03-22, Phone	0 h 35 min
IP2	2016-03-22, Phone	1 h 5 min
IP3	2016-03-29, Phone	0 h 35 min
IP4	2016-03-23, Location	0 h 45 min
IP5	2016-03-30, Phone	0 h 55 min
IP6	2016-04-01, Phone	0 h 45 min



IP7	2016-04-01, Location	0 h 55 min
IP8		Unable
IP9		Unable
IP10		Unable

IP=industry partner

2.4 Data analysis

After collection of data, in terms of interview answers from members of the research projects the Material was analysed based on a grounded theory approach. Grounded theory is defined as ‘theory that was derived from data, systematically gathered and analysed through the research process’. The essential activities In this method is the focus and relationship between, data collection, analysis, and eventual theory. This approach have an interactive perspective which means that the collection of data and the analysis repeatedly refers back and forth, and that these parts are shaped along the process. One of the most essential part of the grounded theory approach is the coding of data. The transcriptions and notes from the study is reviewed and categorised into group which are later compared and analysed with findings in existing literature. (Bryman & Bell, 2011) In this study, data collection, review of the literature and analyzing have been parallel processes. The answers from the interviews was coded and categorized based on findings the literature review with the aim to find interesting contrast or similarities.

2.5 Reliability & Validity

Validity and reliability are a measurement of the quality of the study. The reliability concerns the generalizability of the study. (Bryman and Bell, 2011)This is often a great challenges for qualitative studies since the studies sample is small. Qualitative studies are often based of social phenomena which is also the case of this study. A social setting is hard to “freeze” and apply to general situations since it is dependent on the individuals that is studied in the case in a particular moment. It is very hard to tell if the individuals would give the same answers if the setting was



different. Since this research is based on data collected from a single case it is difficult to tell whether the results and findings and generalized to similar projects as well.

Validity of a qualitative study is referred to “*whether you are observing, identifying, or “measuring” what you say you are*” (Bryman and Bell, 2011). There is always a risk that the researcher have not critically analysed the results and that the true information have not been revealed. This study have been conducted by a single author the there is a risk that her own interpretations have affected the results of the study.



3. Literature review

This literature review has explored research areas of innovation, innovation management, university-industry relationships, collaborative research and knowledge transfer. Existing literature in these field have been reviewed critically and a summary of interesting findings is presented below.

3.1 An introduction to innovation

Innovation have become an important phenomenon for many different actors in society. Firms are concerned of their ability to manage innovation and politicians use innovations as a crucial factor to growth and welfare. Because of the many different assets that innovation can bring to society, it is an interesting and worthy concept to study. (Fagerberg, 2014) The initial research and theories around the phenomenon innovation can be traced back to the second world war. During this period innovation was viewed as a linear process that started with a scientific discovery, that was development within the firm and later released to the market. The next dimension of innovation that emerged a few years later was a model that claimed that the market was the source of discovery. (Rothwell, 1994)

The concept innovation continued to be an attractive subject to study as it gave firms means to compete and it reduced wasteful failures. The linear process emerged into a complex system where several factor got to play an important role when creating successful innovation. (Rothwell, 1994) Today, the ability to manage innovation determines an organisations' survival and success. Innovation can both be an outcome or a process, and it contributes to competitiveness, sustainability and economic performance. Research presents multiple benefits, both socially and economically, from innovations. Thus, the returns gained from the phenomenon are greater to the organisations and individuals that better understands and manages the complexity of innovation. (Dodgson, Gann & Phillips, 2013)

Innovation can be developed from many potential sources. (Dodgson, Gann & Phillips, 2013) Access to external knowledge have been recognised as an important factor in the development of successful innovation. (Rothwell, 1994) External resources can increase the value of an innovation when an organization does not hold all of the necessary parts of the value chain in-



house (Chesbrough 2006). This access can reduce both the cost and time of technological development (Rothwell, 1994). One external source that has given attention from the innovation research is academia and universities (Chesbrough 2006)(West & Bogers, 2013). This will also be the focus of the theoretical chapter in this study - how innovation can be generated from cooperation between academia and industry.

3.3 Innovation and academia

In organisations' search for innovation choosing external sources could be valuable strategy. A commonly used external source for innovation is universities. Existing literature on university-industry relationship is very broad and focus both on economical perspectives (Salter & Martin, 2001) and social effects (McKelvey & Ljungberg, 2014). Perkman (2013) argues that existing literature clearly presents commercializations as an important way for academic research to contribute to innovation. Commercialisation is often used as a an example when studying the impact that is generated from a university-industry relationship because it measures market outcomes. (Markman et al., 2008). Thus, it is suggested that more attention should be focused on the multiple other ways in which university research could be used. "Academic engagement" is defined as "knowledge-related collaboration by academic research with non-academic organisations". This engagement could include both formal, such as collaborative or contract research, and informal activities, such as networking. (Perkman, 2013)

Collaborative research between industry and university have been associated as a source of innovation because of the knowledge transfer that occurs in such collaboration (Ankrah et al, 2012). Mckelvey & Ljungberg (2014) separates the innovative outcomes in collaborative research in two different groups, tangible and intangible outcomes. Tangible innovative outcomes are new or improved products or processes, such as patents or spin-offs. From a collaboration it may also emerge intangible outcomes that lead to development to a firm's capabilities and indirectly affect innovativeness.

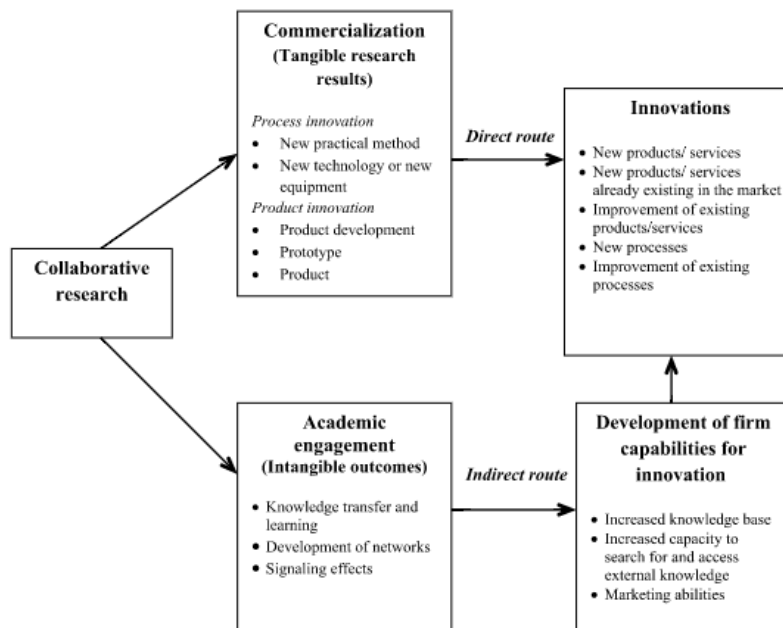


3.3.1 A conceptual framework for collaborative research

The framework developed by McKelvey and Ljungberg (2014) explains that collaborative research projects between universities and industry partners have two broad outcomes before creating innovations, commercialization or academic engagement. They distinguish between direct outcomes, which could be new product innovations, and indirect outcomes such as the development of capabilities to innovate. Their framework tries to present an alternative to how public policy can stimulate innovation, by connecting universities and industry partners through collaborative research. (Mckelvey & Ljungberg, 2014)

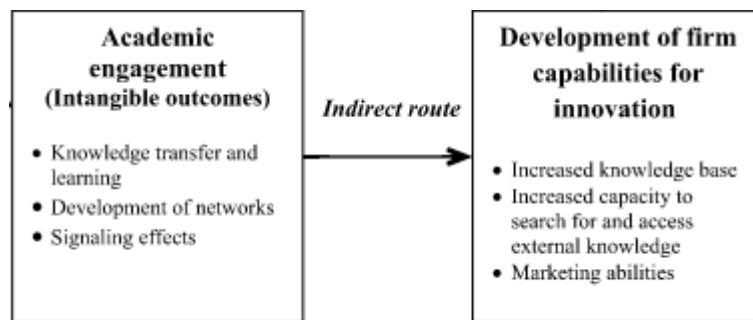
Academia is a source of knowledge and information for firms which do not have their own R&D capacity. Firm's interaction with universities could also stimulate their innovativeness by developing internal capabilities. A collaborative research project could both give direct innovative outcomes, which are referred to as commercialization. In contrast is academic engagement, which is referred to as the indirect outcomes that might be the result of a collaborative research project. These outcomes will stimulate firm's internal capabilities and indirectly create innovations. (Mckelvey & Ljungberg, 2014)

Figure 1. Conceptual framework of how collaborative research can impact firm innovation
(Mckelvey & Ljungberg, 2014)



Academic engagement was originally defined by Perkman et al. (2013) as “knowledge-related collaboration by academic researchers with non-academic organisations”, these collaborations both includes collaborative research, consulting or networking. Academic engagement can be a source of innovation which cannot be directly developed internally by the firm. In the framework above, three outcomes of collaborative research have been presented that contribute to the development of firm capabilities for innovation. (Mckelvey & Ljungberg, 2014)

Figure 2. Academic engagement (Mckelvey & Ljungberg, 2014)



Knowledge transfer

The first intangible outcome is knowledge transfer and learning which includes both transfer of specific technology knowledge, knowledge of new methods or more general knowledge about existing solutions. The partners within the project could share and transfer valuable knowledge and experiences between each other. If a successful transfer occurs it could lead to development of capabilities for innovation. (Mckelvey & Ljungberg, 2014) Knowledge transfer in collaborative research project is the focus of this study and will therefore be further developed and explained in later sections of the report.

Network

A second effect from collaborative research is the network development that is created among the different partners within the project. (West & Bogers, 2013)(Mckelvey & Ljungberg, 2014) This network can provide the firms with valuable research both during the lifetime of the project, but also after project have ended. (Mckelvey & Ljungberg, 2014) Network is a facility which helps organisations develop their innovativeness from collaborative research. (West & Bogers, 2013) Networks create an informal sharing of ideas and knowledge between participants, which also

creates a trust between the individuals involved. (Salter, A.J. and Martin, B.R. 2001) The concept of open innovation assumes that organisations use both internal and external ideas, a single organisation cannot innovate by itself. To stimulate new ideas and build competitive advantages the firm has to engage with different partners in their external environment. (Dahlander & Gann, 2010) Access to a greater and stronger knowledge base give them an advantage in the search for innovations. Few firms holds all the steps of the value-chain that is required to put an innovation to the market. To create as much value as possible from an innovation is therefore to bring in complementary assets that could be found in networks. (Chesbrough, 2006)

Signal effects

Finally, the third outcome that is included in the framework of Mckelvey and Ljungberg (2014), as an outcome of collaborative research is the acquiring of signal effects to third parties. Interaction with a well-known university or other organizations with good reputation in the industry gives a signal of high quality products and can be used for branding of the firm. Publishment of scientific articles is also a valuable source of information to other firms. (Mckelvey and Ljungberg, 2014)

3.4 Knowledge transfer

Knowledge transfer can be defined as “the process through which one unit or individual is affected by the experience of another”. This definition have emerged from analyses on knowledge transfer on an individual level in cognitive psychology. (Argote & Ingram, 2000) Knowledge transfer between individuals have been studied in psychology research for many decades, but in the end of the 80’s researchers started to investigate how the process of knowledge can be used in organizations strategic management. Globalisation was one of many reasons to why many organisations identified the need to transfer knowledge between different departments. An organization's internal knowledge became a valuable resource, and a successful strategy to manage the process of knowledge transfer could lead to competitive advantages and valuable market shares. Today, extensive empirical evidence exists in the topic of organizations ability to transfer knowledge, these theorie indicates that organizations that master this transfer effectively are more likely to survive and conquer its competition. (Argote et al., 2000)



The possession of valuable knowledge in one part of the organization does not necessarily mean that other part of the firm will be shared this information, so that the organization as a whole can benefit from this knowledge. This is one argument to why both organizations and researchers became interested in the process of knowledge transfer and what capabilities this process requires. (Szulanski, 2000) Organization's ability to transfer knowledge is often referred to as “absorptive capacity”. Cohen & Levinthal (1990) developed this theory which explains a firm’s capacity to recognize valuable information and knowledge and the ability to apply it to commercial purposes. These capabilities are crucial in organizations’ ability to innovate and create competitive advantages. (Cohen & Levinthal, 1990)

The process in which knowledge transfer in an organization's occurs have been described by many authors (Argote & Ingram, 2000). Gilbert (1995) developed an empirical framework which present this process in different steps. The knowledge transfer is described as a dynamic process where continuous learning is a crucial feature, the four steps included in the process are acquisition, communication, application and assimilation. The first step is acquisition of knowledge or information which will be determined by the organizations earlier experiences and knowledge. The next step is to communicate and distribute the knowledge. This can either be done verbally or by writing. After the distribution the knowledge must be applied within the organization to make sure that the knowledge is learned by others. This step is often more important than the knowledge itself. The fourth and last step of the process, assimilation is referred to the successful result of the application, where the new knowledge have “stucked” and included in routines within the organization. (Gilbert & Cordey-Hayes, 1996)

The interaction between organization and individuals is a crucial in the process of knowledge transformation. The development of innovations is dependent on new knowledge as the process includes defining and solving of problems. (Nonaka, 1994) As stated in earlier in the study firms and individuals need to search in their external environment to find knowledge that will complement their competences. Collaboration with others is considered as an mechanism for knowledge transformation, where the participants learn from each other. (Caloghirou et al., 2004)



From a literature review based on research of knowledge transfer in relationships between universities and industry actors, four categories or areas of research have been identified. Two of these focus on the internal organization and the characteristics of the firm or the university. Another category is geography in terms of localized knowledge spillovers which relates to the success of performance in industry-university collaborations. The fourth category have another focus which is the channels of knowledge transfer. Researchers have studied the importance and differences of knowledge transfer pathways that exists between universities and firms, such as patents, publications and collaborations. (Agrawal, 2001)

Several theories concerns the tangible outcomes of knowledge transfer between universities and industries. (Santoro & Gopalakrishnan, 2000) Recent studies argue that successful results from an R&D relationship between universities and firms may not always be shown on the surface, in terms of successful R&D results. (Bjerregaard, 2009) Thus, the transformation of knowledge is more than tangible outcomes, such as patents and academic spin-offs, it is a process with activities and interactions. (Santoro & Gopalakrishnan, 2000) This study will in that sense have a focus on the sharing and usage of knowledge between the representatives from university and industry within a collaboration. The aim of the study is to investigate how university and industry partners within collaborative research can benefit for intangible outcomes of the projects in terms of transformation of knowledge between participants, knowledge that could later be used internal in the organizations or be used for innovations.

Knowledge is created and learned by individuals and is therefore affected by both internal and external factors that have an impact on the knowledge transfer process. The following section will present four different factors that have been identified from the reviewed literature. These factors are found to have impact on the transfer of knowledge within a collaborative research project and the development of firm capabilities for innovation. These factors; *motives*, *commitment*, *trust* and *structure* are defined in the following chapters and later analysed with the collected data.



3.4.1 Structure

One of the factors that have been identified from existing literature is defined as *structure*. The structure of an organization or project can have different shapes and features. To be able to effectively interact and absorb knowledge from external environment, the knowledge transfer process need to be institutionalized which include routinization of knowledge acquisitions activities. (Santoro & Gopalakrishnan, 2000)

The transformation process of knowledge can be compared with the innovation process, which is a multi-staged process where the different steps of initiation and implementation have certain needs for structure. It is proposed that the creation or search of knowledge and new ideas requires a organic structure which enables organizations to be flexible and be able to more effectively scan the environment for interesting information. (Santoro & Gopalakrishnan, 2000) Nonaka (1994) highlights the importance of discontinuity in the creation and transfer of knowledge. Chaos in the environment can generate new patterns of interaction between individuals and organizations. (Nonaka, 1994) However, a mechanistic structure might be more suitable in later stages of the process which includes knowledge acquisition and implementation. This part of the process of knowledge transfer is facilitated by formal structure and routines. To find an appropriate structure that will foster knowledge transfer is important to apply a dynamic mindset and have the ability to switch between an organic structure and formal routines and activities. (Santoro & Gopalakrishnan, 2000)

3.4.2 Commitment

Another factor that have an impact on the process of knowledge transfer in collaborative research is commitment (Barnes et al. 2002). Nonaka (1994) argues that commitment determines individuals' and organizations' activities in knowledge creation. Three factors can be found that generate commitment within an organization, these are *intention*, *autonomy* and *fluctuation*. *Intention* concerns how humans try to understand and form their approach to their environment. *Autonomy* is a concept that allow flexibility and creativity. By promoting autonomy it allows individuals personality to influence the organization and the possibility of finding unexpected opportunities may increase. Autonomy will also motivate individuals to for new knowledge as a sense of purpose will take form. While the concept of intention is internal to the individual,



fluctuation have impact on the environment where the individual interact with other. In these interactions discontinuity and chaos from fluctuation can generate new ideas and knowledge. Researchers have also promoted “breakdowns” and interruption of individuals habits, which will generate questions about the value of habits and commitments. (Nonaka, 1994)

Commitment in collaborative research is very much dependent on the individual that represent the partner organisation in the project, the so called “gatekeeper”. As these key individuals are very important for the project outcomes, and this vulnerability can be a great challenge. Is any of these gatekeeper disappears or quite the project, they will probably be very hard to replace. (Thune, 2011)

3.4.3 Motives

Existing literature argues that both universities and representatives from different industries are motivated to create relationships and collaboration to take advantage of their complementary resources and skills. From interaction with the industry a university gets access to knowledge in product development and market opportunities. The firm might give universities the opportunity to learn from practical examples where research can be applied. (Ankrah et al. 2012) The relationship might also provide the university with additional technologies and specific companies might also be used for branding strategies and give the organization good reputation. (Dooley & Kirk, 2007) Collaborations with universities is often a cheaper option for the firm than usage of research in-house. (Ankrah et al. 2012) The university have already established the techniques and methods needed for the research which will make it more cost-efficient. The collaboration do also provide the firm with knowledge in science and technology, which benefits firm’s capacity to innovate. (Dooley & Kirk, 2007)

The motives of participating in a collaboration differs between the partners since the university is mostly interested in publishing and industry partners have a more commercial interest and focus on product development. To create a successful collaboration it is important that the partners’ motives and objectives of the research is communicated and understandable for all the involved and that the research is heading towards a common vision. (Speakman, 1996) A commonly motive for both universities and industry partners is the benefits that the society might get from



collaborative research. Both political and public pressure motivates actors from universities and industries to cooperate to contribute to welfare economic development. (Ankrah et al. 2012)

3.4.4 Trust

Trust have been defined as “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control the other party” (Mayer et al., 1995). Partners are vulnerable because their lack of control of their own resources, however trust could reduce this vulnerability. Santoro & Gopalakrishnan (2000) have identified different ways how trust can conquer this vulnerability and help the knowledge transfer process. Trust mitigate relationship ambiguity and foster cooperation rather than skepticism, firms become more willing to share feelings and ideas. Trust also give participants in the collaboration confidence about their partner's capabilities and motives and in what way knowledge can be used. Trust also help when managing economic transaction as it could work as a control mechanism. (Santoro & Gopalakrishnan, 2000)

As research collaborations is embedded in social interactions and relationships trust may contribute to mutual understanding of the participants. Existing literature argue that in some collaborative projects researchers could benefit from short-term goals with focus on their resources and to maximize the research outcomes. However, if the partners in the project lack experience of collaborations and have no previous relationships with each other, a long-term strategy with focus on networking and learning is necessary to bring out successful research outcomes. (Toke Bjerregaard, 2009)

Open innovation is a well established concept within innovation management and research which assumes that organisations are in need of both internal and external ideas to be able to innovate. (Dahlander & Gann, 2010) Trust could contribute to openness between the partners within a collaboration which would contribute to firms’ willingness to share experiences and knowledge. In return the university would provide the industry with the kind of knowledge that they need. If the openness and sharing continues the possibility of creating a sustainable and long-term



relationship is very likely, which will facilitate knowledge transfer activities as well in the future. (Santoro & Gopalakrishnan, 2000)

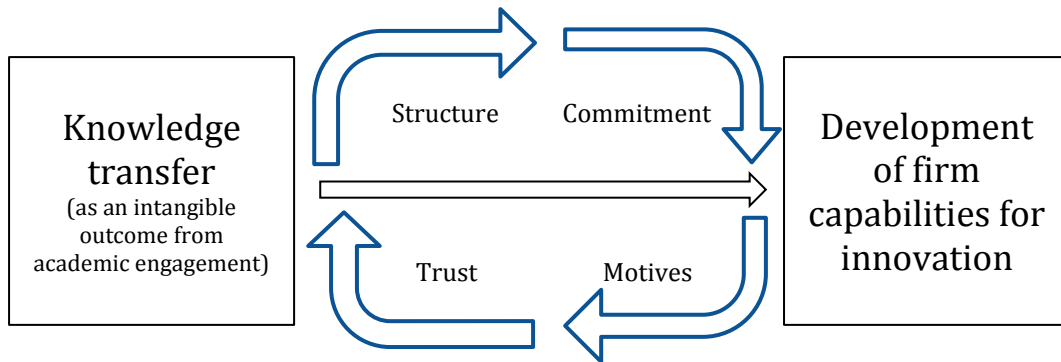
3.5 Summary

The partners within the project could share and transfer valuable knowledge and experiences between each other. If a successful transfer occurs it could lead to development of capabilities for innovation. (Mckelvey & Ljungberg, 2014) Thus, this process when knowledge transfer between participants in a collaborative project is developed to firm capabilities for innovation certain factors need to be considered.

The structure of the project and the knowledge transfer needs to be examined and evaluated as different phases of the project required different types of structure. It is proposed that the creation or search of knowledge and new ideas requires a organic structure which enables organizations to be flexible information. In later stages of the process might need a more formal structure which will enable knowledge acquisition and implementation. (Santoro & Gopalakrishnan, 2000) Commitment is the factors that determines individuals' and organizations' activities in knowledge creation (Nonaka, 1994) and motives defines what are organisation expects of the project. (Ankrah et al. 2012) To create a successful collaboration it is important that the partners' motives and objectives of the research is communicated and understandable for all the involved and that the research is heading towards a common vision. (Speakman, 1996) Trust is an important factor in the process as it mitigate relationship ambiguity and foster cooperation rather than skepticism, firms become more willing to share feelings and ideas. (Santoro & Gopalakrishnan, 2000) The model below symbolizes the process when knowledge transfer contribute to the development of firm capabilities for innovation, and the factors that have an impact on this process. There is also an assumption that these factors have an internal impact on each other.



Figure 3. Contribution of knowledge transfer to the development of firm capabilities for innovation



4. Result - Case study

This chapter presents the results from the case study. The following sections include a description of the collaborative research project that have been studied and the findings from the semi-structured interviews that was done. The answers from the interviewees have been categorized and summarized based on the factors structure, commitment, motives and trust.

4.1 Research project

The research in the project that is studied is performed by researchers at one of the universities. The project is a spin-off from another project that is held by the leading university, but that project have more participants and runs during a longer period of time. Several of the involved partners are members in both these projects. The aim of the project is to develop an innovative material made of cellulose that will replace existing solutions that is less environmental friendly. The future material will hopefully be used in many different industries, such as food, packaging or in sanitary products. The industry partners involved are both companies that provide the research with raw material, companies that provide techniques and tools, and partners that holds a potential market and end-customers. The project consists of 12 organisations which includes representatives from 2 universities, 1 research institution and 9 companies. The section below presents short descriptions of the partners and participants of the project. The structure of the project and how the research is being practised will also be described.

4.1.1 Project partners

University I - The university that is leading the project is an university of technology, well known for its research and education. The university holds the project management team and post-graduates performs the actual research. Bachelor and master students in the university do also provide the project with research.

University II - The other university involved in the project holds research and education in many different areas, such as business, law, economics, medicine, psychology, IT, art and pedagogy. The role of the university in this project have a focus on business and management matters. Their



participants evaluate social factors of the research process, and do not focus on the technology research in project.

Industry partner 1 (IP1) is a Swedish company which could potentially use the innovations to replace existing material in their products. The company have 7.400 employees which are located in 90 different countries.

Industry partner 2 (IP2) is a Swedish company which is owned by Swedish farmers. They can both provide the commercial applications of the research outcomes. The company have 8.000 employees, located in 20 different countries.

Industry partner 3 (IP3) is a Swedish organization built on a network. The members of this network are representatives from 250 companies within the packaging industry. Their role in the project is to represent their industry and find possible applications of the innovation among their members. The company have 9 employees.

Research institute (IP4) – The research institute is a governmental institution which have a mission to help organization create innovation. They offer research and knowledge within several areas such as energy, infrastructure, life science and environment. The research institute support the project with research and supervision. The institute have 1.400 employees.

Industry partner 5 (IP5) is a Swedish company with 500 employees. They provide the project with raw material in hope that the research outcomes in the end will give their production a higher value.

Industry partner 6 (IP6) is an international company with roots in Sweden. They have 55.000 employees located in 80 different countries. The company operates in different areas of the chemistry industry and provides the project with valuable knowledge and resources.

Industry partner 7 (IP7) is a Swedish company with 44.000 employees and operates in approximately 100 countries. They wish to use the research and potential material in development of their products. They provide the project with knowledge of potential products and markets where the innovation can be applied.



Industry partner 8 (IP8) is a Swedish company with 6.700 employees. They are a potential provider of raw material, but do also have an interest to use the future material in their products.

Industry partner 9 (IP9) is a family owned company in Sweden with 9 employees. They provide the project with machines and techniques that can be used to produce future material.

Industry partner 10 (IP10) is small Swedish company which also provide the project with techniques for production of the potential material.

4.3 Project structure

Project board

The collaborative project has a board which holds the overall responsibility and possess the highest ranking in decision making. The board consists of representatives from all of the different organizations involved in the project.

Project management

The project management team make sure that the research performed is running according to plan and they control in what direction the project is turning. This group consists of researchers from the leading university and a representative from the research institute. They have an overview of the project progress and supervise the research process. They meet and discuss the project every second week.

Meetings

The project meetings have different types of meetings where the project progress is presented and discussed. A, so called, project meeting occurs twice a year and all the partners are invited. In these meetings general presentations of the research outcomes are held by the researchers.

As a complement to the project meetings there is also reference group meetings. These meetings give the partners the opportunity to discuss challenges and issues within the project with each



other. These meetings are also held approximately two times a year, and the aim is that these meetings will give valuable input and guidelines to the research process.

4.4 Interviews

The answers that was gathered from interviews with the participants in the collaborative research project have been categorized from the factors found in the literature review: *commitment*, *motives* and *trust*. Below follows a presentation of the author's interpretation of the answers.

4.4.2 Commitment

IP6 expressed that commitment differs from different participants and that commitment also can vary in different phases of the process. IP1 express that there have been a good commitment from many of the partners, and that a new partners have been included during the process is a sign of a high degree of commitment. IP6 believes that the commitment from others is very dependent on what phase of the process that the project is in. This is also confirmed by IP5, he experienced more meetings and a higher degree of commitment in the beginning of the project, and a little bit less today.

Many of the industrial partners thinks that lack of time makes it difficult for them to be engaged in the project. The participants only have a certain amount of time and the project is not always prioritised among other missions and tasks. IP4 believes that the commitment is connected to the research results. Up until today there have not been any successful research results in terms of developed material. He thinks that the commitment might increase when a larger amount of successful research outcomes is shown.

The researchers interviewed have only felt commitment from a few of the partners. These partners have help them with guidance and expertise in the research field. IP3 express that his commitment and time put on the project is quite low and that it depends on his experience and knowledge in the field. He is not an engineer och scientist and express that it his hard for him to know how to contribute. He is very open to help and to contribute to the process, but do not know how. IP5 says that they the commitment can vary from time to time, when they are "needed" and can contribute to the process with inputs the commitment is higher from them. He feels that their



organization have been able to contribute to the direction of the project, but that they could provide the project with more resources and expertise than they do today.

4.4.3 Motives

The answers presented below is to questions concerning what the partners expect from the research project, and what the results and outcomes will be. They also answers why they are participating in the collaboration.

IP1 express that the reason to why they participate in this project and similar collaborations is to gather knowledge. Both knowledge about the research, material and about new processes and methods. He does not have any higher hopes of a successful outcome of the project, in terms of a usable material. They are more interested of the knowledge that is created from the research. He believes that the research being done in this project is to far from new product development.

IP2 participate in the project in hope of finding ways to develop their side streams and give them a higher value. They have not contributed with any financial support, and thinks that these kind of project is a great opportunity and do not see any reason not to participate. Their main motive is to give their organization's activities a higher value. As a supplier they hope that the project outcomes will give the raw material a higher value.

IP4 and IP7 have very clear motives of the project, they expect that the result of the research will give them a substantial quantity of material that can be further used for new product development. IP7 have also been clear of what features and attributes that they expect that the material will have in order to be used by them. However, both the partners express that the research is in a very basic stage, and that the research for the material have been more difficult than what they first expected. Together with IP5 and IP6 a long term goal is to find new methods for this kind of research. IP5 does also have a long term motive that they wish that the research will increase the value of their internal production, for example find new methods or new materials from side streams.



IP3 chosen to be a part of this collaboration because they saw an potential that this research might have benefits to their industry that they represent. They wish to transfer the knowledge created in the project to other actors within their industry. They was invited to the collaboration as an actor that will provide the project with valuable contacts and resources from the industry that they represent.

Both of the two PHd students interviewed have the motive to finish their degree, which is also the main motive to why they participate in the collaboration. None of them have any interest in knowledge about new product development or areas of where the developed material might be applied in the future. They are mostly interested of performing research with successful results which will be a part of their doctoral.

4.4.4 Trust

One reason to why certain individuals is a part of this project is because of earlier collaborations with similar constellation of partners and individuals. IP1 express that one of the advantage with this project is that the partners involved are not in direct competition of each other. The partners have been chosen in a manner that the partners will instead complement each other, and that every phase of the value chain is represented - from supplier to producer and end customers. However, IP1 believes that the sharing of knowledge and information is dependent on what kind of information it matters, some information is more sensitive than other. IP1 also think that the collaboration forces the organizations involved to better describe their problems and issues. When these are defined it is easier to get answers and information in exchange. Interaction gives information about potential markets, customers and suppliers.

IP2 thinks that networking is one of the most important aspect in these kind of projects. He thinks it is necessary to see what kind of actors that is interested and active in this sector of research. He also think that it is important to meet other industries, to talk to them and here of what expectations of the project that they have. He believes that the meetings are very important. A lot of information that is discussed and brought up is not included in the meeting protocols, if you do not attend the meeting you will miss out of many things. IP2 express that he likes to understand what is going on, "I like to create networks apart from my own. I like to bring together people



that might benefit from each other.. But I guess that that is just who I am...”. He express that the “chemistry” between individuals are very important, and that the responsible representatives from the university need to be open to new contacts and collaboration, something that he thinks that this project have. Similar to the answers from IP2, IP3 do also like to create contact between individuals, and match partners that could benefit from each other.

IP4 describes this project as very unpretentious, and that all the partners are talking to each other. In similar project there is sometimes a specific organisation that is a strong leader and that the other partners do not dare to question. Thus, he does not think that is the case in this project. IP4 continue to describe that this project consists of partner that are dependant of each other in order to create successful outcomes. In other project the partners can sometimes only focus on their part without talking to the others. He also thinks that it is easier to interact with someone that you knew earlier, “If you do not trust the others it is hard to come up with new ideas and that will also affect the commitment”.



5. Analysis

The following chapter presents a discussion, in which the findings of this study are compared and analyzed with existing literature. Similar to previous chapters the analysis will be structured after the four factors that is considered to have an impact on the knowledge transfer process within collaborative research; structure, commitment, motives and trust.

This study has followed and investigated a collaborative research project where both university and industry partners are involved. The research that is performed within the project is very complicated and in a very early stage of basic research. The participants involved are well educated and skilled within their fields, and represents organizations from different industries. Up until today, the research have not entirely gone as planned. Many of the processes have taken more time and have been more complicated than expected. However, the organizations involved posses great resources, and an assumption is that many of the complications that have occurred could be managed by the knowledge that the individuals and organizations in the project holds. The crucial part is that the valuable and necessary knowledge needs to be revealed and transferred within the project. The project have been analysed from four different factors that have an impact of knowledge transfer between participants in a collaborative project. I the table below the main findings from these factors are presented.

Figure 4. Main findings

Factors	Academic engagement - Knowledge transfer	Development of firms’ capabilities for innovation
Structure	- The need for appropriate structure and strategy for knowledge creation and sharing	<ul style="list-style-type: none"> - Increased knowledge base - Idea generation - Network development
Commitment	<ul style="list-style-type: none"> - Feelings of contribution and understanding - Willingness interaction and sharing 	
Motives	<ul style="list-style-type: none"> - Development of a common vision - Understanding of others’ objectives 	



Trust	- Lack of opportunities to share experiences rather than issues of trust	
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5.1 Structure

The structure of the project is made to create interaction between the partners of the project. The sub groups have different goals and objectives that they aim for, and the planned meetings give the partners the opportunity to interact with each other and get information about the research results. According to the literature the knowledge transfer process needs routines and institutionalized activities in which the knowledge is treated. (Santoro & Gopalakrishnan, 2000) During the meetings many of the topics and discussions are written down in a protocol. However, during coffee breaks and while eating lunch the discussion continues and valuable knowledge might be transferred between the partners. It is very hard to measure or investigate how much and what kind of knowledge that is shared and transferred during informal conditions. As IP2 expressed, *“it is very hard to know exactly where a certain idea or knowledge is absorbed, from what project or from whom”*. It might also be a combination of many collaboration at the same time that brings certain knowledge or opportunities to the surface.

A project could benefit from knowledge transfer by applying different structures in different phases of the process. In the beginning when knowledge is created it is proposed that it is desirable with a dynamic and flexible environment which could generate new patterns of interaction between partners. (Nonaka, 1994) Collaborative research project often start with a long and extensive period where the contracts and agreements are conducted, which was also the case with this project. Agreements and contracts are necessary in these kind of collaborations, but it is also important to understand how these types of activities might prevent a dynamic environment, and further on affect transfer of knowledge. Formal contracts may also prevent the project to take in necessary resource when needed.

5.2 Commitment

Commitment is essential to get successful outcomes of a collaboration (Barnes et al. 2002) and the factor does also have an important role in the knowledge transfer process. Several partners



indicate that the commitment have been high, but that it varies between different phases of the project and between different individuals. Answers from the interviewees indicates that the commitment is determined of both personal but also organizational interest. One of the partners felt that he could not contribute to the research due to his background and experience that is far from the research that is performed. This was probably a reason to why he have been less active in the project, it could be hard to feel committed when not feeling involved. Thune (2011) highlights the importance of the “gate keeper” which is the representative of the organization in the project. If the organization will benefit from the collaboration in term of access to external knowledge it is important that the representative involved in the project feel committed. The commitment will make him or her more interested in interactions within the project and to the research results. The “gate keepers” needs to feel a purpose and have an understanding of the on going project. The knowledge necessary to create successful research outcomes might exist within the collaborations, but if no commitment or willingness to interact and share this knowledge exists many resources and opportunities are wasted.

5.3 Motives

To create an effective knowledge transfer in a collaborative research project it is important to create a common vision and have an understanding of the different motives that the organizations involved possess. (Speakman, 1996) From the answers from the interviews it is clear that the motives and objectives of why organizations are involved in the project differs. Some of the participants explained very clear motives and had specific expectations of the research outcomes. Others had motives that was more unclear, they simply express that they are involved because it is “something that they usually do”. However, all the organisations pointed that they would never get involved in a collaboration if they could not see that the project would give any potential value to their organization.

The partners involved in project did not seem to have any specific knowledge of the motives of the other partners apart from that they were interested in this research area. If the partners was better aware of each other's motives and expectations of the project a common vision and goal could be developed. By being aware of the different motives that exists in the project it would also be easier for the partners to know what knowledge that is needed to reach the stated goals.



5.4 Trust

Trust can build a bridge over vulnerability and ambiguity between partners. (Santoro & Gopalakrishnan, 2000) As many of the individuals in the project are familiar with each other from earlier collaborations there is a common trust and openness between some of the partners. The interviewees expressed that it is easier to interact with “people you know”. Trust gives the participants confidence in each others’ capabilities which could open up for ideas about new ways in which their knowledge can be used. Even though there is a common perception that there is an openness between the partners some members of the project express that very few organizations share information, thus this might not depend on trust. The reason to why there is a lack of sharing of experiences could depend on willingness to share or that the opportunity to share does not exist.



6. Conclusion

The purpose of this study was to investigate how knowledge transfer could stimulate and lead to firms' development of capabilities for innovations. This has been done by investigating a collaborative research project which aims to develop an innovative material that will replace existing solutions which are less environmentally friendly. The idea for this topic was raised from an interest to investigate what “happens” with the knowledge within a collaboration, how the knowledge is used, transferred and learned by the participants in the project.

The project that this study describes involves both industry partners and universities with extensive knowledge and expertise in different areas. Thus, that is not an obvious reason for knowledge within the project to be properly used in order to bring out innovations. If the knowledge is not shared and learned between the partners great opportunities might be lost. The research questions that this study have aimed to address are defined and answered below.

- *How could firms' innovativeness be developed from knowledge transfer in collaborative research?*
- *Which factors have impact on the knowledge transfer process within a collaborative project?*

Knowledge transfer can be defined as “the process through which one unit or individual is affected by the experience of another”. (Argote & Ingram, 2000) Knowledge is a valuable resources and organizations with a successful strategy to absorb knowledge and information from others might be given many opportunities to innovate.

The process, in which knowledge is transferred, is described as a dynamic process where continuous learning is a crucial feature. The four steps included in the process are acquisition, communication, application and assimilation. (Gilbert & Cordey-Hayes, 1996) It is obvious that the partners involved in the project possess valuable knowledge and experience that can be used to bring out innovations. If this process of knowledge transfer is used in an effective and strategic manner it could develop a firm's ability to innovate and indirectly be an important step in the



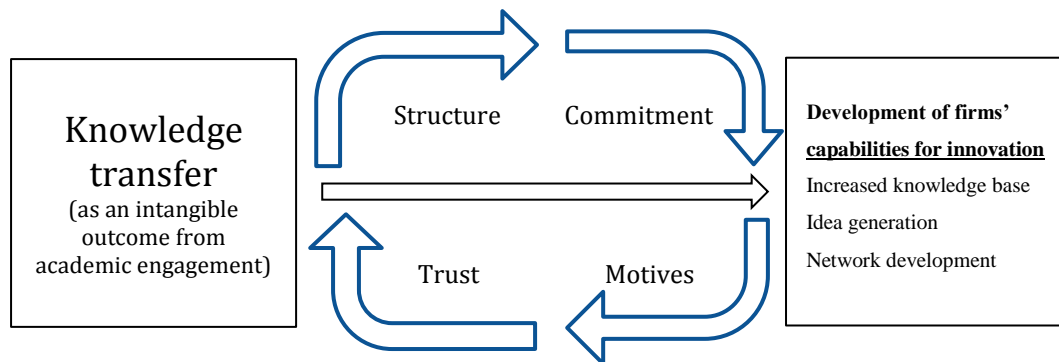
process of innovation development. However, to establish a successful process of sharing, absorbing and applying knowledge certain factors need to take into consideration of the partners involved in the collaboration.

The first factor identified is *structure* and the need of an appropriate structure and strategy for knowledge creation and sharing. *Commitment* determines the organization's involvement and engagement in the project with less willingness of interaction and sharing of knowledge with the other partners less knowledge will be transferred and the probability that capabilities for innovation will be developed is decreased. It is essential that the partners have feelings of contribution in the project and that the information that is exchanged within the project is understandable for all the partners involved. By understanding each other's *motives* and expectations of the project it would be easier for the partners to know what knowledge that is needed to reach the goals stated. The final factor that is investigated is *trust*. Trust is important for knowledge transfer as it can build a bridge over vulnerability and ambiguity between partners. (Santoro & Gopalakrishnan, 2000) and gives the participants confidence in each others' capabilities which could open up for ideas about new ways in which their knowledge can be used.

Factors	Academic engagement - Knowledge transfer	Development of firms' capabilities for innovation
Structure	- The need for appropriate structure and strategy for knowledge creation and sharing	<ul style="list-style-type: none"> - Increased knowledge base - Idea generation - Network development
Commitment	<ul style="list-style-type: none"> - Feelings of contribution and understanding - Willingness interaction and sharing 	
Motives	<ul style="list-style-type: none"> - Development of a common vision - Understanding of others' objectives 	
Trust	- Lack of opportunities to share experiences rather than issues of trust	



Figure 5. Contribution of knowledge transfer to the development of firm capabilities for innovation



- *What implications can these factors have on the case project?*

This study is based on an perception and assumption that if knowledge was transferred in a more effective manner within the collaboration, the partners would benefit in their development of capabilities for innovation. Capabilities that can later be used internal or in other projects in the development of innovations. To enhance the transfer of knowledge the project could create a dynamic and flexible structure where the partners is given the opportunity to interact and share experience. The research performed in the project is in a very early stage and it is therefore hard to know what knowledge that is needed in order to support the research process. By creating an environment that enables the partners to meet with each other in an informal manner more knowledge and ideas might be created and shared. These informal and dynamic environments will also be good opportunities for the partners to share their motives by each other. It might be found that some of the partners possess valuable knowledge that would help the project to proceed, this will give the partners the feeling of contribution which will also enhance their commitment to the research progress. Increased interaction between the partners would led to that the partners will get to know each other more. By building trust between the participants will open up for confidence in each other's capabilities and ideas for how knowledge can be combined and used in new ways.

7. Limitations and future research

This is a case study of a collaborative research project between industry partners and universities. The limited time frame have affected the extent of this study since only one case have been studied. It would be interesting to investigate similar projects and compare the findings in order to create more extensive study and more generalized results. An expansion of this study could be further research of what capabilities of innovation that is developed from knowledge transfer and academic engagement. Organizations are striving to be more innovative, and it evidence exist that collaborations enhance this development it would increase the attractiveness and interest in these types of project. It would probably also affect firms commitment and engagement with universities to the better.



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Appendix

Interview questions

- What do you hope will be developed, in terms of interesting research results from your project in Smartfoam? Why is the scientific research interesting?
- Can you please specify what you expected, when you started the project, to have as the final result of the research in your SP?
- Would you like the research results to have an impact on – for example *product, process, technology, service, equipment, measurement, method, patent*?
- What do you think this final expected result will contribute to in the overall Smartfoam project?
- How will the final expected result incorporated into the company?
- What problem your results should solve? What if they do not?
- What does the final expected result do that is better than existing solutions? What is the ‘value’ to a consumer or another company?
- What do you think are the expected results in September 2016? At what stage of your research do you intend to be? Can you please provide us with a description of what you hope will be accomplished by then? (Please specify by providing a description with concrete examples)
- What about March 2017? At what stage of your research do you intend to be? Can you please provide us with a description of what you hope will be accomplished by then? (Please specify by providing a description with concrete examples)
- How does this process of defining research relevant to both universities and companies occur? What works well? What could be improved?
- How does your firm make sure they can innovate (in general) in your industry?
- Who are the leaders or makes sure that these applications are developed? How do you provide input and guidance about expected applications to the collaborative projects in Smartfoam?
- What types of aims do you have for projects within Smartfoam, in comparison to projects that you run internally in the company?
- Who are your main contacts / collaborators within the project during the past 6 months?
- How and why did your company or research team at university get involved in Smartfoam?
- How did you select partners in the collaboration?
- Are there any partner organizations that you personally have worked with in research projects before?
- Are there any partner organizations that your company or university have worked with in research projects before?



- What kind of relationships do you have with the other projects and their SP teams? (Do you meet frequently with other teams? Do you know their members? Do you exchange with them on side of the project?)
- What are the main challenges of working with a different types of organization? (e.g. if a company, of working with a university. If a university or institute, of working with a company)
- How working in smartfoam may affect the perception of your organization?
- So far, how do you think that your collaboration in SmartFoam project will change (or add) to how your own organization is perceived by stakeholders?
- So far, can you say you have increased your understanding of your field? Give an example
- In what way does your organization benefit (or not) from access to individuals that have specific knowledge and training about the project?
- Please describe your background knowledge you want to bring with you in the project
- Can you describe or give examples of what types of knowledge will be generated from the project? ('new' for you)
- Please also provide an overview of the actual competing solutions if any.
- Do you expect the knowledge outcome of the project to change some aspects of your organization' strategy or knowledge base? If yes why and how?
- Can you give an example of how the project network can help increase your knowledge base? What do you 'gain' from this interaction over research?

