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**Incubating open innovation: How can the participation in the COII support
companies to open up?**

A single case study exploring open innovation within an incubator

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Abstract

Title: Incubating open innovation: How can the participation in the COII support companies to open up? – A single case study exploring open innovation within an incubator

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Keywords: Open Innovation; Openness; R&D Management; Knowledge Management; Knowledge Flows; Inter-firm knowledge transfer

Research question: How can the participation in the COII support companies to open up?

Methodology: The thesis applies a single case study design to examine an opening up process in relation to open innovation. The thesis used a qualitative research strategy with inductive design with influences of deduction. The primary data emerged from semi-structured interviews to grasp an in-depth understanding of the phenomenon, with the goal to let theory arise from the data. In order to make sense of the data, a transparent and systematic technique to data analysis is applied.

Theoretical perspectives: The theoretical concept underlying this study is open innovation and the outside-in and inside-out knowledge flows basilar to it. In that relation the COII is studied as a tool for open innovation, while simultaneously classifying the COII with theory on incubators. In order to measure a company's openness and therefore the opening up effect within the incubator this thesis is further utilizing theories in knowledge and inter-firm knowledge transfer.

Conclusions: The case company under study recently formulated a new strategy to engage more in open innovation and is participating in a COII since 2017 as part of this new direction. However, companies need to achieve a certain kind of openness to profit from knowledge flows across boundaries of the firm. The results show that a participation in the COII supports companies to achieve a higher degree of openness, especially by facilitating outside-in knowledge flows in open innovation. In that relation the analysis did not significantly confirm that the participation in the COII facilitates inside-out knowledge flows. Furthermore, this study explores enablers that create an environment that fosters knowledge sharing as well as

knowledge practices that comprise of methods and activities. Both enablers and knowledge practices foster knowledge flows within the COII. This study contributes to the knowledge body of open innovation by scrutinizing a new form of this concept, namely the COII. Moreover, it unveils how companies generate knowledge flows when they embody the incubatees themselves.

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Glossary

COII	Corporate Open Innovation Incubator
Enablers	Conceptual tool which describes an asset or process that allows an organization to achieve its objectives
HR	Human Resources
Incubatees	Three companies participating in the COII
Knowledge practices	Different methods and activities an organization can utilize to boost knowledge flows
KPI	Key performance indicator
NDA	Non-disclosure Agreement
NPD	New Product Development
S&P	Standard and Poor's
R&D	Research and Development
Newstream	Open innovation in the form of inside-out and outside-in knowledge flows within the COII
Oldstream	Open innovation in the form of inside-out and outside in knowledge flows through collaborations with suppliers, partners or customers as complementing the case company's R&D

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Chapter 1. - Introduction

1.1. Background

“In the long history of humankind (and animal kind, too) those who learned to collaborate and improvise most effectively have prevailed.” - Charles Darwin

Surviving and growing as a company in a rapidly changing global environment is becoming more challenging from day to day. The average lifespan of S&P 500 companies has dropped from 60 to 15 years over the past century (Foster & Kaplan, 2011). Thus, creating a sustainable competitive advantage is the fundamental aim of all corporation's nowadays (Kuratko, 2011). Companies that are more adaptable, flexible, fast, aggressive and innovative are better positioned not only to adjust to a dynamic and complex environment but to create change (Heavey et al, 2009). However, innovation requires heavy R&D investments, unique knowledge and creativity which can be barriers especially for mid-tier companies with limited resources. Following the arguments put forward by Enkel and Gassmann (2006) the high competition, globalization, and shorter product life cycles increase the pressure on companies to innovate. This gives rise to several environmental challenges for the closed innovation model in the past decade, including the boom of knowledge workers, employee mobility, the appearance of private venture capital, the shortening of life cycles, and increased R&D costs (Huang et al., 2013). By utilizing the closed innovation model corporations could rely on internal R&D to develop new products in labs that were considered as entry barriers for competitors (Van de Vrande et al., 2009). In the face of this, businesses with closed innovation models find it difficult to compete (Huang et al., 2013).

The mentioned change leads to the necessity for firms to optimize and consequently open up their innovation processes to access more knowledge sources on the one and to gain profits from internally developed knowledge on the other (Chesbrough, 2003). However, the step to open up is preceded by the decision whether innovations can be developed internally or with external actors in form of other organizations or individuals (Dahlander and Gann, 2010). Accordingly, it is important to emphasize that internal R&D and openness for ideas and resources from external actors are viewed as complements in the innovation process (Dahlander and Gann, 2010).

With regards to the mentioned challenges open innovation has been proposed as a new paradigm for the management of innovation (Chesbrough, 2003). It is defined as “the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and to expand the markets for external use of innovation, respectively.” (Chesbrough et al., 2006). With open innovation, companies switch from the traditional closed innovation to an open one, which means their innovation boundaries are permeable, ideas are flowing easily into and out of the organization, thus more knowledge is available to innovate (Chesbrough et al., 2006). Following there are many different degrees of openness that may be equally successful depending on the internal and external environment. This study determines the degree of a company’s openness by measuring inside-out and outside in knowledge flows and therefore utilizes the study released by Enkel and Gassmann (2004).

Since this study aims to measure openness by the generation of inside-out and outside-in knowledge flows, the term knowledge itself plays a decisive role to be transparent in the analysis. In that relation it is important that the collected data describe organizational as well as individual knowledge. However, the focus lies on the organizational level. In the same sense Cohen and Levinthal (1990) stated that the achievement of organizational knowledge goes in hand with and is often build on prior investments in individual knowledge. In that relation knowledge is defined in the following way: “*Knowledge* consists of contextualized information, and is characterized by giving it a meaning, making it relevant and easy to operationalize. Information are transformed into knowledge by comparing and contrasting, detecting relationships between them and in the following presenting consequences” (Tidd & Bessant, 2014).

Besides the framework to measure openness, evolving from the theory by Enkel and Gassmann (2004) this study will use the theory by Armbrecht et al. (2001) as a tool to analyze possible enablers and knowledge practices fostering knowledge flows. Accordingly, the enablers and knowledge practices foster the knowledge flows that are defined by the outbound and inbound processes and therefore influence a company’s openness in the COII. By building up on the framework by Armbrecht et al. (2001) this study aims to emphasize how enablers and knowledge practices in the COII foster knowledge flows and whether the incubator embodies further enablers and knowledge functions. In contrast the theory by Armbrecht et al. (2001) did not

study the connection with open innovation regarding collaboration with external partners and described a phenomenon of knowledge flows within a corporation.

In terms of knowledge exchange in outside-in or inside-out processes, open innovation can be executed in different ways. Therefore, the outside-in process can increase the degree of a company's openness by enriching the knowledge body through integrating suppliers, customers and external knowledge sources (Gassmann & Enkel, 2004). These sources should be integrated to leverage valuable knowledge flows that are needed for product development. Moreover, this can be achieved through buying IP licensed patents. Companies that master the integration of sources for knowledge flows can therefore successfully combine internal company resources with knowledge from collaborating parties and following enable new product development across company boundaries (Gassmann & Enkel, 2004). Additionally, a corporate incubator can function as a tool to generate outside-in knowledge flows for corporations. Therefore, companies can leverage inflows of knowledge, for instance in the form of business building expertise or by spinning-in ventures into the corporation (Gassmann & Becker, 2006)

Existing literature presents several ways to transform to a higher degree of openness of inside-out knowledge flows as a company. Following companies can increase knowledge flows by bringing ideas to the market, outsourcing or selling IP (Gassmann & Enkel, 2004). Thus, companies utilize inside-out process to launch products faster to the market than they would be able through internal development. Furthermore, evaluating openness with the number and diversity of collaboration partners in open innovation is presented within the research of Laursen and Salter (2006). Consequently, a similar assessment is carried out in this thesis by studying the above mentioned dimensions.

In order to present a clear picture of the underlying concept of the COII a definition is emphasized. As it is later discussed comprehensively, a Corporate Open Innovation Incubator (COII) is defined with the following lines: *Institutions offering a shared office-space facility that seek to provide corporates with a strategic, value adding intervention system of monitoring, business assistance, networks and encourages collaboration between the incubatees (corporations) in order to foster innovation in large established organizations by using open innovation practices outside the boundaries of the companies.*

Moreover, companies seek to minimize the risk and to decrease the development costs through developing products in collaboration or via sourcing internally developed knowledge out to external entities (Gassmann & Enkel, 2004). According to Gassmann and Becker (2006) a corporate incubator can also function as a tool for inside-out knowledge flows by leveraging internally developed technologies to the market that can be commercialized in other industries.

Subsequently and in line with Gassmann and Becker (2006) corporate incubators, whether they are viewed from an inside-out or outside-in process perspective, can be utilized as a tool to facilitate knowledge flows. However, existing literature on corporate incubators has elaborated on these flows by viewing inter-organizational exchange between startups as incubatees and corporations. This thesis contributes to this body of research by studying outside-in and inside-out knowledge flows within the COII that entails mature corporations as incubatees instead of startups. Accordingly, the COII facilitates inside-out and outside-in knowledge flows with other incubatees, which are not in the same value chain, face common challenges related to their size and maturity and can therefore share valuable knowledge and feedback on each other product ideas. Moreover, this form of an incubator stands out since companies can gain valuable outside-in knowledge in relation to new working methods and cultural change for open innovation. Subsequently companies directly source outside-in knowledge flows as incubatees instead of leveraging it through corporate incubators for startups which function as an intermediary.

With regards to the uniqueness of the COII Lichtenthaler (2011) pinpointed that further work on other external innovation sources deserves more attention. Accordingly, this research focuses on a new form of open innovation, an incubator which is working with corporations instead of startups. This goes in line with an increasing trend of business incubators. Following the number of European accelerators and incubators has risen by 400% between 2007 and 2013 (Salido et al., 2013).

In summary, this chapter pinpointed that this thesis is contributing to theories in the research area of open innovation by viewing the COII as a tool to open up a company. In line with that the paragraph depicted on the uniqueness of this tool by defining it and classifying it in relation to other open innovation activities. Therefore, the aim of this thesis is to measure how the COII facilitates this process of opening up a company by enabling inside-out and outside-in

knowledge flows as well as access to more and diverse knowledge sources in open innovation. By utilizing the data theory from Gioia (2012) to let theory derive from data, this study aims to measure openness in the COII. In that relation the COII has to be viewed as part of an overall organizational strategic change towards opening up a company by engaging more intensively in open innovation.

1.2. Problem discussion

Chesbrough (2003) depicts on open innovation as the actions of companies in order to break through their closed borders to generate more innovative ideas from their external environment and at the same time share internal innovative ideas in collaboration. For many corporation's open innovation has become more than an option: it has turned into a necessity since they do not have the resources and competences to merely innovate in-house and seek to minimize the risk by using collaboration (Chesbrough, 2003). In many branches companies are overstrained by the necessary investments and resources to push through innovations, which leads to an increasing importance of opening up to innovate in collaboration with partners, suppliers or customers (Gassmann & Enkel, 2006; Lichtenthaler, 2011).

Especially for companies that do not have the necessary resources and competences to create their own corporate incubator or own venturing departments to absorb innovative ideas, the participation in COII offers an attractive possibility to foster open innovation without bearing high risks and investments.

Several studies have pinpointed the importance of openness for companies in order to benefit from open innovation. Accordingly, Chesbrough (2003; 2006) stated that companies can leverage the knowledge of other companies and can therefore enlarge their knowledge body, since not all smart people are working within one company. Subsequently, a corporation needs to generate outside-in knowledge flows in form of ideas and resources to remain competitive (Chesbrough, 2003). Additionally, Koschatzky (2001) stressed that "firms which do not cooperate and which do not exchange knowledge reduce their knowledge base on a long-term basis and lose the ability to enter into exchange relations with other firms and organizations". Following it is crucial for companies to generate external knowledge flows to increase

innovativeness and shorten time to market (Koschatzky, 2001). Moreover, a higher degree of openness can go hand in hand with financial benefits, since the investment in internal R&D can be leveraged through the combination of knowledge with external partners, which was disconnected by silos before (Dahlander and Gann, 2010).

The importance of openness pinpoints the necessity for corporations to engage more in outside-in knowledge flows and therefore benefit from open innovation.

On the other hand, the transformation from a closed R&D to open innovation through inside-out knowledge flows and achieving a higher degree of openness can be challenging for corporations. One example can be found in the paradox of openness by Laursen and Salter (2014). Accordingly, firms need to generate a certain kind of openness in order to benefit from open innovation, but on the other hand need to focus on protection of their knowledge in order to capture value from the collaboration (Laursen & Salter, 2014). This is important due to the fact that while revealing information or even IP has high risks, it is crucial for improving innovation efficiency and effectiveness (Henkel et al. 2014). In line with that most industries are still characterized by tight protection of IP, which can be a drawback in the learning process (Henkel et al. 2014). A further barrier to openness can be found in the not-invented-here (NIH) syndrome and in the lack of internal commitment, which describes the resistance of internal employees to implement knowledge that has been created outside the company boundaries (Chesbrough and Crowther, 2006; Katz and Allen, 1982). Additionally, literature in collaborative innovation depicted on possible barriers in cognitive, organizational, cultural and institutional differences between open innovation collaborators (Boschma, 2005). Therefore, these theories pinpoint that barriers may occur due to insufficient knowledge, modes of organization, cultures or bureaucratic elements (Boschma, 2005). The stated barriers of inside-out knowledge flows pinpoint the necessity of tools, which can be utilized by companies to benefit from openness and open up in the same way.

Overall, this thesis contributes to the open innovation literature by studying outside-in and inside-out knowledge flows in a COII and the connected effect on openness. Furthermore, it describes the COII itself, while focusing on how knowledge is flowing within the incubator.

Additionally, it significantly differs from existing studies by describing the functions of a new form of open innovation while focusing on how knowledge flows are facilitated.

1.3. Purpose and research question

The focus of this thesis lies within emphasizing differences in utilizing the oldstream openness in the case company in order to illuminate the newstream openness within the COII. Accordingly, the conceptual classification is on the one hand based on open innovation collaborations with suppliers, partners or customers complementing the case company's R&D which are determined as oldstream process. On the other hand, these oldstream processes will be utilized to emphasize open innovation in the form of inside-out and outside-in knowledge flows within the COII which is described as newstream process.

With the data analysis this study aims to show specifically how this new form of open innovation - COII - encourages companies to engage in outside-in and inside-out innovation processes as a form of openness in the incubator. Moreover, enablers and knowledge practices that foster knowledge flows in both directions within the COII will be explained and analyzed. Following this study aims to show that the participation in the COII engages corporations to source and reveal knowledge in outside-in and inside-out innovation processes as a form of openness as well as embodies enablers and knowledge practices that foster these knowledge flows. Therefore, the research question of this study is formulated as follows:

How can the participation in a COII support companies to open up?

The purpose of this study is to contribute to the research gap in the theory of open innovation, by extending the existing literature with a definition of a new form of open innovation and how it influences the process of opening up a company. The COII offers services for incumbents that struggle to open-up and want to embrace open innovation. Accordingly, this study considers the term of opening up a company equally like the openness, namely to achieve more inside-out and outside-in knowledge flows. The COII clearly distinguishes itself from incubators in existing literature through analyzing the effects of utilizing open innovation in an incubator that is placed outside the boundaries of a company. Moreover, this study seeks to substantiate the necessity of

a COII for corporations that struggle with open innovation and to give explanations why it is especially relevant as a first step to open up R&D.

1.4. Case company

The design of the thesis is a single case study about how companies engage in inside-out and outside-in knowledge flows in a COII and how this affects their opening up process. Since the case company is participating in a COII from 2017 on, it provides an interesting possibility to utilize the data deriving from inside-out and outside-in processes of the case company in order to emphasize the degree of openness within the COII. In order to help the reader to understand the research and the context of the firm the following paragraphs introduce the company, its general situation, origin, and activities in a COII which are relevant.

Founded in 1970 in Scandinavia, the case company grew rapidly to become one of the top players in the ceiling market. They compete in the building materials industry with a focus on acoustic solutions and offer a product portfolio of ceilings, wall panels, design items and suspension systems. The company is present with business units in 14 countries and delegations in another 30 countries worldwide. Based on the 750 employees they are a mid-tier company, the average age is around 40 and employees mostly have a technical background. Nowadays the company belongs to a large group which is one of the world's 100 top industrial corporations.

In terms of open innovation, the company engaged in a few collaborations in the past, both failed and successful ones. After the arrival of a new CEO and Head of R&D a revived strategy with the aim of opening up the company was initiated. As part of this articulated aim and in order to foster open innovation the firm joined to the COII in 2017, which is initiated and owned by an open innovation agency.

This section clarified that the case company provides a suitable case for the selected research topic. The findings will contribute to existing in literature as well as assist firms that struggle to open up, by highlighting how the COII can facilitate the openness of companies engaged in open innovation. The following paragraph delineates a description of the the COII, which embodies concept paramount to this research.

1.5. Corporate Open Innovation Incubator - COII

The COII is owned by an open innovation agency in Sweden. The incubator works with three participant companies from different industries and located in a science park. Companies are offered a shared office space, where the employees of the incubatee corporations usually work one or two days within a week. Each company is allocating 6-10 employees to work with open innovation in the incubator. The innovation agency provides coaching with one head coach and four additional mentors. Special workshops with guest coaches are also provided. The aim of this program is to collaborate, learn, foster creativity and develop innovative projects with support and coaching by the organizing agency.

The COII has three phases. During the first phase every corporation decides on what project to run within the COII. This is usually one month long and includes an evaluation to determine certain KPIs for each case and the next eight months of milestones and coaching. The second eight months long phase is about learning, developing and mentorship. The support is usually twofold: recurrent activities and customized events for each corporation. Companies are not only learning different business and innovation methods, frameworks and processes but also participate in factory visits or learning a new type of HR planning. Collaboration is usually higher within the first two phases, where companies are supporting each other to make strategic decisions and also evaluating the project of others. Through the third phase which lasts for three months companies explore the possibilities for the future of the project. They can also develop operational, sales and marketing strategies with the help of the mentors and other companies. Finally, they can decide to continue with the project inside the COII or develop it internally.

The data collection of this study took place during the third phase of the COII program. However, the data also gave fruitful insights into earlier phases and importantly into collaboration between the incubatees as a form of open innovation.

To provide clarity the theoretical definition of the COII was created based on three studies from existing literature on incubators (Table 1): *Institutions offering a shared office-space facility that seek to provide corporates with a strategic, value adding intervention system of monitoring, business assistance, networks and encourages collaboration between the incubatees*

(corporations) in order to create a supportive selection environment for innovation and counteract the constraints inhibiting innovation in large established organizations by using open innovation practices outside the boundaries of the company.

1.6. Outline of the thesis

This master thesis consists of six chapters comprised of the presentation of the concepts outlined previously in this section, the applied methodology, the findings as well as the analysis that emerged from the research. Subsequently, the second chapter depicts an extensive literature review in relation to all relevant concepts to answer the research question. In chapter three the study elaborates on the chosen methodology approach for data collection and analysis. Continuate the fourth and fifth chapter delineates the main findings of the research and elucidates the analysis relevant to the research question. Finally the sixth chapter is drawing conclusions from the analysis in the previous chapter and addresses limitations, managerial implications, and suggestions for future research.

Chapter 2. - Literature review

This chapter will elaborate on existing literature in its field of research, which comprises of open innovation as the area of contribution and additional theories on incubators in order to define the underlying concept of the COII as a tool for open innovation. Consequently, the subchapters review literature in open innovation, openness and open innovation, knowledge flows and openness, incubators as a form of open innovation, incubators as a form of openness to finally lead the reader to the concept of the COII. The literature paramount to this study therefore functions as a framework for the data analysis in chapter 5 and simultaneously aims to distance this study from existing research by developing an alternative theoretical position (Bryman & Bell, 2014, p.690).

2.1. Open innovation

Creating and combining a variation of knowledge sets is a major focus of corporations. However, heavy R&D funding is not sufficient for incumbents to keep up with dynamic markets and competitors. Companies like Procter and Gamble, 3M and Siemens understood that they need to accelerate open innovation initiatives to generate a fruitful knowledge body besides heavy R&D investments to stay ahead of the game (Tidd & Bessant, 2014, p.311).

The term of open innovation was initially determined by Henry Chesbrough in 2003 and defines innovation processes in which companies generate an expressive knowledge base through inside-out and outside-in knowledge flows in exchange with their environment (Chesbrough, 2003).

By performing open innovation firms transform from a traditional closed system model of innovation, to a more open one where organizational boundaries to innovation are permeable and innovative ideas are easily flowing into and out of the organization (Kuratko et al., 2011, p.107).

Even if open innovation requires processes that open up the company, open innovation strategies can be either managed in an open or closed manor (Chesbrough, 2006).

Chesbrough et al. (2006) addressed two approaches by suggesting that the core of open innovation is the utilization of outside-in and inside-out knowledge flows in order to foster internal innovation as well as the commercialization through external utilization of innovation (Chesbrough, Vanhaverbeke, & West, 2006).

In relation to that, the concept, open innovation can be separated into outside-in and inside-out processes. Outside-in knowledge flows comprise actions in relation to the absorption of external knowledge, by in-licensing or through strategic partnerships (Dahlander and Gann, 2010). To profit from external knowledge exploration, companies need to open up their innovation process to acquire knowledge from external sources (Lichtenthaler, 2011). Outbound innovation is an inside-out process, which drives the active use and commercialization of knowledge outside a firm's organizational boundaries, for example through free revealing of innovations or licensing out (Dahlander & Gann, 2010). Inside-out practices require to open up the innovation process of companies in order to exploit knowledge to capture the value of internally developed technological knowledge (Lichtenthaler, 2011).

Besides the literature that is based on the work of Chesbrough from 2003 that elaborates on the term open innovation, there are many additional and influential studies in the general field of inter-organizational innovation (e.g., absorptive capacity; see Cohen & Levinthal, 1990) that contribute to a better understanding of open innovation.

Another differentiation is created by Lichtenthaler (2011) who distinguished open innovation research into four areas: technology transactions, user innovation, business models, and innovation markets.

Firstly, research in technology transactions has elaborated on R&D alliances and inward technology transfer. Further the necessity to develop an internal organizational capability was depicted by research on absorptive capacity (Lichtenthaler & Lichtenthaler, 2009). In contrast, several works focus on outward technology transfer and external knowledge exploitation (Chesbrough, 2007). Furthermore, other research has delineated the need to retain knowledge outside a company's boundaries over time (Dittrich & Duysters, 2007). In addition, studies about inter-organizational innovation networks characterizes essential contributions to the field of open innovation (Ahuja, 2000). On the one hand many studies have been conducted on inbound open innovation technology transactions (Zhao & Anand, 2009, p. 963). On the other hand, outbound open innovation has been mostly disregarded (Chesbrough, 2003; Lord, Mandel, & Wager, 2002).

The second and earliest area of open innovation research focuses on user innovation by examining how companies can collaborate with users to explore new knowledge and ideas (von

Hippel, 1988). More recent works have depicted how corporations can benefit from user communities and user-led innovation in open innovation processes (Bogers, Afuah, & Bastian, 2010; West & Lakhani, 2008). Different studies have exemplified how idea competitions can support open innovation processes (Piller & Walcher, 2006). The described area stream of research is based on earlier work on the role of communities to support open innovation (Franke & Shah, 2002).

The third research area emphasizes on the role of business models in the context of open innovation. In contrast to the second area it focuses on how companies can exploit knowledge in open innovation processes (Chesbrough, 2006; van der Meer, 2007). Earlier, studies in that area have elaborated on the question whether appropriability fosters or hampers open innovation activities (West, 2006). The discussion around appropriability is especially crucial when companies are opening up their innovation processes (Helfat, 2006). Furthermore, studies depicted on the complexity of the role of intellectual property in the context of open innovation (Alexy et al., 2009). In addition, some works focused on corporate venturing as a way of innovation in corporations (Vanhaverbeke et al., 2008).

The fourth area of research elaborates on innovation markets (Chesbrough, 2007). Studies in this area mainly emphasize the importance of inter-firm technology transfer to facilitate open innovation. In contrast to many other works that emphasize inbound open innovation, researchers in this area are using a balanced approach to address inside-out and outside-in processes simultaneously (Arora & Gambardella, 2010). In the context of important intermediaries studies focused on new types like Internet marketplaces for intellectual property and technology auctions for technology transfer (Chesbrough, 2006). Finally, an increasing importance of innovation markets can be determined in multiple works (Arora & Gambardella, 2010).

By comparing the openness of the company in relation to knowledge flows in existing open innovation collaborations, with the openness within corporate incubators likewise the COII, this study contributes to the fourth area of research depicted by Lichtenthaler (2011) by examining inside-out and outside-in flows of knowledge between corporations and incubators as a form of open innovation.

Moreover, the emphasis on inside-out knowledge flows relates to theories on IP management and protection as an influencing factor of revealing knowledge and therefore embodies a contribution to the third area of research depicted by Lichtenthaler (2011). Accordingly, the following

paragraph will elaborate on how a corporation's openness is defined and described as a basis for the further data analysis in chapter 5.

The comparison underlying this study is on the one hand based on open innovation collaborations with suppliers, partners or customers as open innovation activities complementing the case company's internal R&D which are determined as oldstream processes. On the other hand, these processes are contrasted with open innovation in the COII, namely newstream processes. Both processes are examined as outside-in and inside-out knowledge flows. However, it is essential to highlight that the aim of this comparison is not to focus on contrasting oldstream and newstream, but more to utilize the oldstream data to underline the delimiting openness of knowledge flows within the COII. Thus, studying these flows within the company and connecting it with the COII aims to provide context to understand the situation and development of openness.

2.2. Openness in open innovation

The previous section determined the necessity for companies to open up their innovation process to profit from the underlying outside-in and inside-out knowledge flows of open innovation. However, the step to open up is preceded by the decision whether innovations can be developed internally or with external actors in form of other organizations or individuals (Dahlander and Gann, 2010). Accordingly, it is important to emphasize that internal R&D and openness for ideas and resources from external actors are viewed as complements in the innovation process (Dahlander and Gann, 2010). In this regard, companies vary in the degree in which they evaluate, screen and assimilate external knowledge to the innovation process (Laursen and Salter, 2006). On the contrary, companies emit remarkable resources and time on internal R&D (Dahlander and Gann, 2010). Subsequently, it is crucial for firms to find the right balance between internal and external sources for innovation and therefore the right degree of openness (Dahlander and Gann, 2010). Thus, openness cannot be seen as a binary differentiation between open and closed and accordingly needs to be placed on a continuum that describes differing degrees of openness (Chesbrough, 2003). As the aim of this study is to research how the COII supports companies to achieve a higher degree of openness, it is necessary to determine the concept of openness as a basis to measure it in the analysis. However, the concept of open

innovation and subsequently openness is not a clear cut one in current academic literature and can be distinguished by different theories to measure whether a company's activities are more or less open (Huizingh, 2011).

A first approach is to determine whether a company is engaging in inside-out, outside-in or coupled activities. Each of these activities embodies knowledge flows and can be distinguished by a more open or closed character (Gassmann & Enkel, 2004).

Secondly, Lichtenthaler and Lichtenthaler (2009) pinpointed three knowledge flows in open innovation, namely knowledge exploration, retention and exploitation, which can be performed in an internal or external way. Therefore, they identify six knowledge flows embodied in form of knowledge capabilities of a company.

Thirdly, openness can be grouped by separating between process and outcome (Huizingh, 2011). This approach links openness with IT management, where a lot of research was focusing on open source software. Besides the process the outcome of innovation can be closed or open as well (Huizingh, 2011).

Fourthly, the works by Laursen and Salter (2006; 2012) equate openness with the number of external sources of innovation, by the breadth of the firm's innovation search efforts, or the range of different partner organizations in formal collaborations for innovation, namely the external search depth.

Fifthly, research has shown that firms need to protect their intellectual property in order to capture the value in open innovation activities (Henkel, 2006). According to Henkel (2006), openness of a company can be characterized by how many ideas are revealed, which were previously hidden inside organizations.

Finally, Dahlander and Gann (2010) determine openness by utilizing the dimensions of inbound versus outbound open innovation and pecuniary versus non-pecuniary interactions. Accordingly, they develop four possible knowledge flow directions: acquiring (inbound innovation pecuniary), sourcing (inbound innovation non-pecuniary), selling (outbound innovation pecuniary), and revealing (outbound innovation non-pecuniary).

The characterization of openness pinpointed by Gassmann and Enkel (2004) as well as by Laursen and Salter (2006) will embody the foundation of the data analysis. Following, the first theory companies can engage in inside-out and outside-in innovation processes, which embody

knowledge flows that can be distinguished by a more closed or open character. According to the latter theory by Laursen and Salter (2006) knowledge flows and therefore openness can be measured with the external search breadth and depth, which comprises of the number and variety of external sources that firms rely on to open up the innovation process.

In line with the firstly mentioned theory and therefore utilizing the outside-in process (knowledge exploration), companies enrich their own knowledge base through collaboration with customers, suppliers and external knowledge sourcing. The more knowledge companies can leverage through these process the higher their innovativeness and openness (Gassmann & Enkel, 2004). Following one emphasis, this study will pinpoint how oldstream and newstream outside-in processes differ and can therefore enhance the openness of companies through a participation in the COII. The aim of this study is to demonstrate how the participation in the COII enables companies to utilize and source knowledge externally and therefore supports a transformation towards openness. The more outside-in knowledge flows from external sources are generated, the higher the degree of openness.

On the other hand, inside-out processes embody the exploitation of a firm's knowledge through the generation of profits by bringing ideas to the market, commercializing IP and multiplying technological knowledge through transferring internal ideas to the environment (Gassmann & Enkel, 2004). For instance, selling internal knowledge in different industries (cross industry innovation) can increase a corporation's revenue significantly (Gassmann & Enkel, 2004).

Moreover, revealing knowledge always comes at the risk to lose sensitive information to competitors. When corporations engage in inside-out processes they reveal knowledge and following might give up intellectual property (Henkel et al., 2014; Enkel et al., 2009). Accordingly, the challenge for companies lies in finding the right balance in what to reveal and what not to reveal. This can vary from freely revealing knowledge even to competitors without protecting it with patents up to possible overprotection of intellectual property that might lead to obsession with ownership and therefore hampers the development of inventions (Dahlander and Gann, 2010). The degree of openness is changing in the same manner from being extremely open and revealing sensitive knowledge to being secret and protecting all knowledge created within the company. Following a company's openness is determined by knowledge flows for

exploitation of internally developed ideas to the external environment. The more inside-out knowledge flows are created by revealing knowledge the higher the degree of openness.

However, the results of the study by Gassmann and Enkel (2004) shows that both flows embody an open innovation strategy, but are not equally important for every kind of corporation. Accordingly, not all companies implement both processes and therefore decide for one of these as a primary one. Moreover, companies can decide to integrate parts of the elements of the other process, while focusing on the primary as the core (Gassmann & Enkel, 2004).

In addition, this thesis will include the study by Laursen and Salter (2006) to measure the openness and therefore the connected knowledge flows. According to their theory of external search breadth and depth, the number and variety of external sources that firms rely on to open up the innovation process, determine the openness. Or to say it in other words: The more and more diverse partners, suppliers or customers a company involves in its open innovation activities, the higher the degree of openness and therefore the amount of knowledge flows.

In summary, this study will focus on inside-out and outside-in knowledge flows within the oldstream and newstream processes to determine the company's openness within the COII. Furthermore, examining openness with external search breadth and depth is also investigated in this research. In relation to that this study combines two ways of measuring openness because of the unique constellation represented by the COII. Following, the incubator similarly supports knowledge flows as well as access to more and diverse collaboration partners in open innovation. Moreover, this thesis will elaborate on the enablers and knowledge functions that foster knowledge flows in open innovation. These enablers, knowledge functions and the perspective on knowledge will be described in the following paragraph.

2.3. Knowledge flows and openness

The ability of a company to benefit from outside-in and inside-out flows of knowledge, determines whether the transition from a closed to an open innovation process and accordingly a higher degree of openness can be achieved in open innovation. Since this study is measuring openness according to these flows of knowledge, the role of knowledge needs to be defined and characterized.

In order to provide the reader what is meant with *knowledge*, *knowledge management* and *knowledge flow* the concepts of *data* and *information* are utilized to bring light into the discussion.

Data are characterized as a set of observations, number, records or words, which are in most cases easy to structure, store, record or manipulate electronically (Tidd & Bessant, 2014).

Information are described as organized, grouped or categorized data in a pattern. The organization of these data can consist of calculation, synthesis or categorization and embodies relevant and purposeful information, which add value to the data (Tidd & Bessant, 2014).

Overall, *knowledge* consists of contextualized information, by giving it a meaning, making it relevant and easy to operationalize. Information are transformed into knowledge by comparing and contrasting, detecting relationships between them and in the following presenting consequences (Tidd & Bessant, 2014). Knowledge is deeper and richer compared to information and delivers framed expertise, insights and values (Tidd & Bessant, 2014).

According to Kogut and Zander (1992) companies are sharing and transferring knowledge of individuals or groups within the organization. In that case, knowledge is viewed as an individual achievement, but is regularly expressed in social communities like groups, organizations or networks (Kogut & Zander, 1992).

As part of the knowledge based view, these studies argue that companies gain competitive advantage, which relates to the extent to which a firm's knowledge can be replicated more quickly by themselves than by competitors imitating it (Kogut & Zander 1993). Following, Kogut and Zander (1993) pinpointed that companies have a body of knowledge how to cooperate and communicate in an efficient way and can be seen as communities, which are specialized in creating and internally transferring knowledge. The better companies create and replicate this knowledge, the more efficient they are (Kogut & Zander 1993). Moreover, they see foreign direct investment as a way to transfer knowledge within and across the borders of a firm (Kogut & Zander 1993).

However, these theories focused on a firm's ability to transfer and create knowledge internally, but neglected external knowledge sourcing in open innovation. Since the focus of this study lies on knowledge flows across the boundaries of different corporations a different perspective is necessary in order to analyze the data. Easterby-Smith et al. (2008) defined knowledge transfer

as an event through which one organization learns from the experience of another. Additionally, a framework is presented in their research which summarizes inter-organizational knowledge transfer affecting factors. A categorization of four areas are highlighted: factors within the donor firm, factors coming from the nature of knowledge, factors influencing inter-organizational dynamics and factors within the recipient firm (Easterby-Smith et al., 2008).

Accordingly, some organizations have created immense value from knowledge management practices by fostering the flow of internal as well as external information across company boundaries (Armbrecht et al., 2001).

In line with Armbrecht et al. (2001) this study characterizes knowledge management as a knowledge flow process that reaches beyond data and information storage as well as retrieval to embrace creation, retrieval, capture, use and reuse of knowledge and information for innovation. Hence, the promotion of knowledge flows in innovation processes aims to stimulate the creation of knowledge (Armbrecht et al., 2001)

With regards to Armbrecht et al. (2001) knowledge flows are fostered mostly by the enablers and knowledge practices. While enablers should be seen as a “conceptual tool which describes an asset or process that allow an organization to achieve its objectives”, knowledge practices have to be viewed as different methods and activities an organization can utilize to boost knowledge flows (Armbrecht et al., 2001). Namely, enablers are necessary to create the right environment, and knowledge practices are used to help execution. This structure is also researched by Lee and Choi (2003) who studied the relationships between knowledge enablers, processes and organizational performance and highlighted similar enablers as Armbrecht et al. (2001).

The research from Armbrecht et al. (2001) pinpoints the essential enablers culture and structure. Firstly, a culture can have a tremendous effect on knowledge flows. Following a culture that values the creation and sharing of knowledge supports outside-in and inside-out knowledge flows. Accordingly, it is essential to encourage and enable employees to collaborate, interact, teach and learn from each other (Armbrecht et al., 2001). Therefore, the sum of individual knowledge creates a more valuable collective knowledge (Armbrecht et al., 2001). Armbrecht et al. (2001) further divide culture into four highlighted areas: Understanding, support, incentives and interaction. A common organizational understanding of the value of knowledge management programs is mentioned as an important building block. Since a lack of support can hinder

knowledge flows not only top management support but an organizational wide support can facilitate knowledge management. Furthermore, incentives and interaction among employees should be encouraged for the transfer and creation of knowledge (Ambrecht et al., 2001).

Secondly, organizational or physical structure can enable knowledge flows too (Armbrecht et al., 2001). This can be achieved by creating learning networks outside the organization as well as by a high diversity of team-member backgrounds and experience. In contrast, disablers can be found in internal silo-thinking and hierarchical structures that are hampering the knowledge flows (Armbrecht et al., 2001). Structure can be also divided into three crucial areas which both affect knowledge flows. According to Armbrecht et al. (2001) the physical layout of the office is significant in terms of location, size and type and therefore has an effect on human interaction. In addition, the hierarchical structure of an organization also influences knowledge flows. By eliminating organizational layers and setting up cross-functional teams which gives more responsibility to the individuals and eliminates silos, knowledge can flow more smoothly. Lastly, specific knowledge management programs were also pinpointed as an enablers of knowledge flows (Armbrecht et al., 2001).

Furthermore, the study by Armbrecht et al. (2001) states the importance of knowledge flow practices. These practices are the most commonly mentioned by companies who are focusing on knowledge management. They can be further divided into the following three sets.

Networks

A network of experts with different backgrounds usually beneficial for the sake of developments since their multiple knowledge can be implemented within the product or process. Despite of these, informal or external, heterogeneous or homogeneous networks are usually fostering knowledge flows and openness (Armbrecht et al., 2001).

Sharing, Learning and Ideation

Various techniques connected to the above mentioned knowledge practices are stimulating knowledge creation and knowledge flows according to the study. For instance, sharing best practices or a cross-functional ideation session within a global organization can truly add value to the innovation processes (Armbrecht et al., 2001).

Training

Specially focused coaching and trainings can also foster knowledge sharing. Training about explicit tool sets for collaboration is mentioned several times in the study by Armbrecht et al. (2001).

This paragraph defined knowledge as a fundamental concept of the knowledge flows in the oldstream and the newstream process (COII). Moreover, the introduced enablers and knowledge practices are building blocks for the analysis on how the COII actually supports knowledge flows. As the COII is viewed as a tool to engage in open innovation the following section will elaborate how incubators can be utilized to execute open innovation.

2.4. Incubators as a form of open innovation

Firms often struggle to innovate within their boundaries, therefore it has turned into a necessity to create inside-out and outside-in knowledge flows, since they do not have the resources and competences to merely innovate in-house and seek to minimize the risk by using collaboration (Chesbrough, 2003). That is why companies focus more and more on establishing their own corporate incubators and accelerators, usually by collaborating with startups (Hausberg & Korreck, 2018).

The term accelerator can be defined as a cohort-based program that provides startups (teams and not single entrepreneurs) with education, monitoring and mentoring, while connecting them with experienced entrepreneurs, angel investors, venture capitalists and corporate executives (Kohler, 2016). Further, accelerators seek to teach startups the tools to succeed at pitch events, where they present their idea to potential investors. (Cohen 2013; Cohen & Hochberg 2014; Hochberg 2016). However, the term accelerator has not been the focus area for existing research and this study will focus on the term incubator as existing literature represents a better fit and more similarities with the aforementioned COII.

Current research defines incubators as an organization that supplies early stage ventures with a joint location, services, business support and networks (Bergek & Norrman, 2008). Studies on incubators are heterogeneous in terms of how they define the term and have evolved in the course of time. The research area developed from simple real estate projects or university spin-

off organizations to more complex business development support institutions with a variation of different business models (Hausberg & Korreck, 2018).

Another definition of incubators that is useful for this thesis can be found in the work of Bollingtoft (2012). The author depicts on the term of bottom-up business incubators that are founded by a group of entrepreneurs and share the same support offerings as business incubators described by other authors. Nevertheless, the uniqueness within bottom-up business incubators is the focus on networking and cooperation between the participating companies (Bollingtoft, 2012). These two positive effects can also be found within the case of the COIL.

In the study field of corporate entrepreneurship several works have described the term of corporate incubators (Wolcott & Lippitz, 2007). While offering similar services like traditional accelerators and incubators, their main goal is to support and stimulate employees from the companies to develop own ideas into future business units or spin-offs. Moreover, corporate incubators can be distinguished by the corporation as an additional and new stakeholder (Hausberg & Korreck, 2018). In addition corporate incubators are characterized by the overall goal of opening up corporations to create processes with outside-in as well as inside-out knowledge flows (Weiblen & Chesbrough, 2015).

One example of this form of incubation can be seen in the case of the corporate incubator at Phillips, where the authors elaborated on a specific subset of corporate incubation (Ford et al. 2010; Wolcott & Lippitz 2007). In this case, corporate incubation supports incumbents to launch exploratory innovations into the market (Dee et al., 2011; Miller & Stacey, 2014). Ford et al. (2010) depicted on the concept of corporate incubators within the boundaries of corporations. According to the study of Ford et al. (2010) corporate incubators aim to provide an environment where ideas which would be unable to grow within the corporate boundaries can flourish easily. Furthermore, these incubators seek to explore new knowledge from outside the company (Ford et al., 2010; Ford & Probert, 2010). Hence corporate incubators are a possibility to create an environment for entrepreneurial innovation, in which inhibiting constraints of a large corporation can be overcome in order to generate exploratory innovations fostered by the exploration of new knowledge (Hornsby et al., 1993; Gassmann & Becker, 2006). Ford et al. (2010) view corporate incubation as a form of corporate venturing that uses an evolutionary theory approach to develop an alternative selection environment that fosters innovation within a company. This can be

achieved by separating determinants for corporate decision-making from the ones applied within the corporate incubator.

The study by Ford et al. (2010) gave a useful definition of corporate incubators and how corporations can profit from establishing these in order to produce more exploratory innovations and to make decisions that support these ideas to create future growth. Further corporate incubators allocate resources to entrepreneurial initiatives (Ford et al., 2010). In addition, corporate incubators create an environment that exposes ventures to situations like in a market environment for survival, which fosters entrepreneurial decision-making (Ford et al., 2010). They further support the development of really new technologies that could not grow within a corporation's boundaries and would not be chosen for commercialization by internal product divisions (Ford et al., 2010). Additionally, incubators comprise the scale and scope of large, established corporations on the one hand and the entrepreneurial spirit of startups while embodying a unique network on the other. These networks foster connections that help ventures to form crucial strategic partnerships, hire talented people as well as to receive important advice from experts (Hansen et al., 2000).

According to Kohler (2016) corporate incubators stand for the necessary coordination of ideas that fall outside the scope of existing business units. Moreover, incubators embody "...mechanisms to foster partnerships among start-up teams and other successful Internet-oriented firms, thus facilitating the flow of knowledge and talent across companies and the forging of marketing and technology relationships between them." (Hansen et al., 2000).

In addition, networking activities focus on sharing experiences and knowledge related to running or developing business. Different experience gives the incubatees access to different knowledge sets about aspects of running a business (Bollingtoft, 2012). Furthermore, the allowance of significant ownership for the founders maintains a spirit of entrepreneurship (Hansen et al., 2000). In addition, incubators reduce time, cost, and hassles to start a business by providing access to tools to build up the needed infrastructure for a venture (Hansen et al., 2000).

Corresponding to Ford et al. (2010) corporate incubators can be implemented in two different modes, depending on whether the corporation's strategic objective is to focus on exploitation or exploration. If the strategic focus lies on exploration the incubator mainly allocates resources in

opportunities that are created within the corporation and actively supports them in order to transform the business into future growth drivers for the firm. The contrary strategic logic of exploitation seeks to monetize the existing assets (e.g. patents) by spinning them out within a short time frame (Hill & Birkinshaw, 2008). With regards to these two implementation modes the COII can be distinguished by embodying both, exploration and exploitation of knowledge in open innovation.

This section has brought light into different forms of corporate incubators and their characteristics as well as into the strategic aim of corporations behind establishing them. Contrasting these forms of corporate incubators to the COII again yields the uniqueness of the COII in form of the incubatees characteristics. Accordingly, incubatees within the COII are mature corporations, but incubatees as described in existing literature are viewed as startups or new venture teams emerging from corporations. However, as the COII is viewed as a tool to engage in open innovation the following section will examine how incubators can foster outside-in and inside-out knowledge flows.

2.5. Incubators and openness

Corporations that emphasize an open innovation strategy increasingly view startups as a source of external innovation, since they focus on emerging technologies to create new products and disrupt markets by reinventing business models (Kohler, 2016). Accordingly, corporate incubators represent an attractive access to these new ventures to explore innovations for corporate efforts (Kohler, 2016). Especially, in terms of agility and search for innovations startups are ahead of large corporations - on the other hand corporations own resources and have fundamental knowledge in business model execution which startups lack of (Kohler, 2016). The uniqueness and attractiveness within corporate incubators following lies within the combination of corporate ability and entrepreneurial activity, which molds startups and corporations to complements (Kohler 2016; Weiblen & Chesbrough, 2015).

From the perspective of inside-out and outside-in knowledge flows as the substantial part of open innovation in a corporate setting the complementary nature of startups and corporations builds a beneficial foundation for knowledge exchange (Weiblen & Chesbrough, 2015).

Becker and Gassmann (2006) further describe corporate incubators as a knowledge hub of business building expertise, where ideas can flourish and from which knowledge is transferred to more units within the corporation. The authors differentiated between four types of knowledge within various incubators: entrepreneurial knowledge, organizational knowledge, technological knowledge, and complementary market knowledge. Corporations can especially leverage knowledge flows and enhance organizational learning via incubators (Becker & Gassmann, 2006).

Overall, this section demonstrated a wide glimpse on knowledge flows as a form of openness in incubators in order to give an understanding about the phenomena. Due to the uniqueness of the COII, a clear definition and its academic building blocks are introduced through the next section in order to clarify the incubator underlying this study.

2.6. Corporate Open Innovation Incubator

In comparison to startups, established companies savor economies of scale in R&D, are able to diversify their risk, have easier access to resources and to knowledge that documented past drawbacks (Ford et al. 2010). Moreover, and in contrast to future-oriented startups established companies have to defend their history and existing business (Ford et al., 2010).

However existing literature has mainly focused on the collaboration between startups and corporations within a corporate incubator. Moreover, studies about incubators that support incumbents to generate more external knowledge by providing networks with other corporates and by coaching open innovation methods is neglected by current research. Following the uniqueness of this study lies within the case of COII that is located outside a firm's boundaries and that encourages the employees to collaborate with other companies in order to foster inside-out and outside-in knowledge flows.

The definition of the COII developed in this study is based on three works that emphasized (see Table 1) incubation (Hackett & Dilts, 2004), bottom-up business incubators (Bollingtoft, 2012) as well as corporate incubators in an environment supportive for innovation (Burgelman, 1983; Hornsby et al., 1993; Gassmann & Becker, 2006; Nelson & Winter, 1982) and distinguishes the COII from existing theories:

Institutions offering a shared office-space facility that seek to provide corporates with a strategic, value adding intervention system of monitoring, business assistance, networks and encourages collaboration between the incubatees (corporations) in order to foster innovation in large established organizations by using open innovation practices outside the boundaries of the company.

A lot of research has been done on corporate incubators and how corporations can profit from outside-in and inside-out flows of knowledge generated by the incubatees. This study contributes to existing open innovation literature by transforming the theory of corporate incubators that are focusing on the support of startups in the early phase to a new theory of open innovation incubators that especially seek to facilitate open innovation processes at mature corporations as incubatees.

Authors	Definition
Hackett and Dilts, 2004	Shared office-space facility that seeks to provide its incubatees with a strategic, value adding intervention system of monitoring and business assistance.
Bollingtoft, 2012	They are characterized by being jointly established by the entrepreneurs, they are not supported by public or private funds, thus, they carry no costs for society. The bottom-up business incubators share the same overall traits as for business incubators as described in the literature, e.g. co-location of businesses and access to shared equipment, but in contrast to traditional business incubators, it is characterized by being based on mutual recognition of the value of networking as well as cooperation among the firms.
Burgelman, 1983; Hornsby et al., 1993; Gassmann and Becker, 2006; Nelson and Winter, 1982	Corporate venturing and corporate incubators represent forms of ‘corporate entrepreneurship’, simulating conditions conducive for entrepreneurial innovation through attempts to counteract the constraints inhibiting radical innovation in large established organisations. From the perspective of evolutionary theory, corporate venturing can be seen as an attempt to create a more supportive ‘selection regime’ or ‘selection environment’ for innovation within the corporate setting.

Table 1 - Definition Corporate open innovation incubator

Chapter 3. - Methodology

This chapter outlines the methodological approach underlying this study. In line with Bryman and Bell (2015, p.691) this chapter will describe the approach to analyzing the data, how the data sources were selected, the selected case that is paramount to this study, ethical considerations in qualitative research, how the data were collected and analyzed, and finally introduces perspectives on validity and reliability.

3.1. Research approach

This study uses the perspective of Interpretivism, which states that the subject of social sciences on people and institutions differs significantly from natural sciences. Therefore, this thesis seeks to gain an interpretive understanding of social action rather than on the external forces that are without meanings for social interaction (Bryman & Bell, 2015, p.29). Accordingly, the focus of data collection and analysis of this study lies on the perspective of the research participants and how they make sense of the world around them (Bryman & Bell, 2015, p.30).

Following, research methods are not simply viewed as neutral tools, they are in the contrary expressing how social scientists view social reality and how it should be examined (Bryman & Bell, 2015, p.19). In relation to that, the theory is used as an attempt to understand and explain a limited aspect of social life (Bryman & Bell, 2015, p.21).

However, the interpretations can never be value-free or objective. Following, it is a subjective analysis of the social constructs interpretation of the world that is being studied. (Bryman & Bell, 2015, p.40)

Furthermore, this thesis is based on the ontological approach of constructionism. Accordingly, social phenomena like culture and organizations and their meanings are changed on an ongoing basis by their social actors. Hence, social phenomena are exposed to a constant state of revision and produced through social interaction of their actors. Therefore, the social actors in the case company create and shape culture and organizational processes continuously. (Bryman & Bell, 2015, p.33)

3.2. Research strategy and design

This study is based on induction, since it seeks to gain in-depth knowledge of a social phenomenon and the implications from findings are concluded into the stock of theory (Bryman & Bell, 2015, p.23). Following, theory is the outcome of research by drawing generalizable inferences out of observations. However, due to the iterative character of research there cannot be a clearly drawn line between inductivism and deductivism and therefore they should be seen as tendencies (Bryman & Bell, 2015, p.25). By using an interpretative research approach qualitative data from unstructured and semi-structured interviews is utilized in a dialogical process between theory and empirical data (Bryman & Bell, 2015, p.26). Accordingly, the generation of a rich data set allows us to generate theory from empirical research.

In this study the inductivism is complemented with deductive influences as theory helps interpret the empirical findings and make them theoretically significant and generalizable (Bryman & Bell, 2015).

As already stated, a qualitative research is applied in order to understand the social world through an examination of the interpretation of that world by its participants (Bryman & Bell, 2015, p.392). Following, this thesis elaborates on employees' answers to semi-structured interview questions in order to enlighten the openness of companies participating in a COII. Therefore, the theory emerges from data collection and analysis and seeks to view events and the social world through the eyes of the employees (Bryman & Bell, 2015, p.397, 404).

In addition, the inductive approach makes it possible for the study to apply an iterative process of data collection and analysis, and allows to go back and forth between theory and data and change the research focus depending on the findings in the data throughout the research. This is a necessary approach since this study aims to link theory to empirical research (Bryman & Bell, 2015, p. 408).

3.2.1. Single case study design

The aim of the study design is a detailed and intensive analysis of the case in order to depict on the complexity and particular nature of a single organization (Bryman & Bell, 2015, p.67). Therefore, this study views the organization as a bounded system or entity with a purpose and functioning parts (Bryman & Bell, 2015, p.68). Especially the semi-structured interviews generate an intensive and detailed examination of the unique features of the single case (Bryman

& Bell, 2015, p.68). The case study design allows this thesis to examine a single case in order to generate a theory out of the findings (Bryman & Bell, 2015, p.71).

3.2.2. Research process

Since the aim of this study is to formulate a theory based on findings on a case company, an inductive research approach is used (Bryman & Bell, 2015, p.23). Although, it is considered important to mention that a deductive approach played an important role in how unstructured interviews were conducted. Based on theories, unstructured interviews were carried out in order to diagnose openness in the COII in contrast to the oldstream process. These diagnoses led us to the creation of semi-structured interviews to dig deeper into the field and present a final answer to the research question. Overall, the thesis evolved through an iterative research process, where inductivism was used to develop theory based on the findings and deductivism to give this study a direction based on what is known in existing literature (Bryman & Bell, 2015, p.23).

3.3. Data collection method

3.3.1. Case company

The case company for this study was provided through an internship program and was therefore not explicitly chosen to carry out the research. During the first weeks of the research project the authors of this study realized that the case company can provide access to relevant data about how the COII supports participating companies to open up.

3.3.2. Unstructured interviews

In the early phase of this research the goal was to understand how the employees view the social world around them, and to map out the present situation at the case company. Thus, meetings with relevant employees and informal conversations were arranged with the aim of carrying out more and more unstructured interviews (Bryman & Bell, 2015, p.483). The conducted interviews are illustrated in Table 2.

In accordance, this thesis is distinguished into three goals as the foundation of this research:

- *Identify the present situation at the company*
- *Develop the research topic*
- *Reason the opening up process*

Identify the present situation

During the first few weeks it was essential to gather as much information as possible to grasp the employees' view in order to understand events, patterns and forms of behavior (Bryman & Bell, 2015, p.481). Unstructured interviews were conducted with seven people and further informal talks helped to get a clear picture about the company, culture, atmosphere as well as innovation processes. The interviews were primarily held in English and face-to-face meetings at the premises of the case company. In order to not be biased by these initial interviews further interviews were conducted with a variety of people in different positions and from various departments (Bryman & Bell 2015, p.404-405).

Develop the research topic

In order to compile the research topic, more unstructured interviews were carried out. Therefore, discussions were continued in a second meeting with the employees mentioned above. In addition, further interviews were conducted with other employees to get new insights. At this stage a clear view of the research topic was still remote. However, several ideas were developed as well as reviewed by carrying out additional interviews to identify which idea would be the optimal research area for this study. With regard to transparency and credibility the unstructured interviews were recorded, as these guided to the research topic and also influenced the selection of relevant people for further interviews (Bryman & Bell, 2015 p. 401).

Reason the opening up process

Subsequently, the possible research topic was identified with an emphasis on how the COII facilitates knowledge flows between the incubatees and COII employees along with a focus on how to open up the open innovation process complementing R&D. Thus, three more interviews were conducted and recorded to achieve a clear view on these processes and to ensure the

research quality (Bryman & Bell, 2015, p.401). The interviews took place in meeting rooms at the case company to make participants feel comfortable and to fulfill the need of a quiet environment (Bryman & Bell, 2011, p.486). Based on the discussions and incubator literature (Table 1) the definition of the COII was developed. Finally, the research was narrowed down to study how the company generates inside-out and outside-in knowledge flows and how this affects its opening up process.

	Position	Date
First round	Environmental specialist (OI project leader)	2018.01.16.
	Industrialization manager	2018.01.17.
	Deputy of Marketing director	2018.01.30.
	Designer specialist	2018.02.09.
	Head of RD	2018.01.16.
	Acoustic specialist	2018.02.09.
	Product developer	2018.02.07.
	Second round	Environmental specialist (OI project leader)
Head of RD		2018.02.13.
Business Developer		2018.02.07.
Product release and maintenance		2018.02.13.
Designer specialist		2018.02.14.
Third round	Business Developer	2018.02.20.
	Environmental specialist (OI project leader)	2018.02.21.
	CEO	2018.02.20.

Table 2 - Conducted interviews

3.3.3. Semi-structured interviews

Since the investigation started with a fairly clear focus, rather than a very general notion of wanting to do research, semi-structured interviews were the best fit to gain valuable data in the research topic (Bryman & Bell, 2015, p.483). In order to discover the present phenomena in a flexible way, open-ended questions were developed to create a deep discussion and let follow-up questions arise (Bryman and Bell, 2015, p.484-485). Additionally, open-ended questions also helped employees to state their own interpretations, meanings and understandings. The validity of this study was also improved, since employees are able to answer more freely, and the authors have less impact on the outcome (Bryman and Bell 2015, p.484-485).

Furthermore, the fact that employees are usually busy and an interview takes time, it was ensured that interviews are a two-way process, with both parties benefiting from it (Bryman and Bell 2015, p.484-485). Since the work within the case company includes a report containing practical solutions on how to generate and evaluate innovation, all accessed employees demonstrated willingness to give fruitful answers in the interviews.

The emphasis of the interviews laid particularly on the experiences of the interviewees about openness within the case company and in the COII. Moreover, interviews were carried out in person with two interviewers sharing the leading and note taking duties among them (Bryman & Bell, 2015 p.487). Unfortunately, a limitation of this method is the risk of bias: interviewees knew that other employees were also interviewed and therefore they may have felt to answer in accordance with what they assumed others would answer. Nevertheless, the questions were formed carefully and any personal or sensitive topics were avoided (Bryman & Bell, 2015 p.143). Thus it is assumed that the mentioned bias is not significant. In order to be able to ensure an accurate focus on the initial research question all interviewee answers were recorded. This not only gave the required flexibility to ask meaningful follow-up questions but also enabled to repeatedly jump back and analyze what was said, and even more important, how it was said (Bryman & Bell, 2015, p. 504-505). Furthermore, the recording and transcription increases the dependability of the research (Bryman & Bell, 2015, p. 493).

3.3.4. Interviewee selection

In line with the research question the subjects of this study are individuals employed by the case company. More precisely, the focus is on employees who are involved in the COII, since interviewing different employees not involved in the COII could cause ‘noise’ or higher variability (Bryman & Bell 2015, p.716) in the data. Thus, the selection of interviewees was evident in order to gain valuable data. Consequently, the research applies a purposive sampling method with non-probability sampling. In line with Bryman and Bell (2015, p. 430) this allows researchers to select the relevant participants in a strategic way. A clear limitation of non-probability sampling is the factor of human judgement and possible bias, due to the fact that researchers have to select the members (Bryman and Bell, 2015, p. 188). As Figure 1 shows, there are 7 people from the company who are participating in the COII. Nevertheless, the issue of biased selection will not affect the validity and generalization by interviewing all of them.

In order to present a clear picture and provide a better and transparent understanding of how people were selected for the interview, Figure 1 illustrates the company’s project team’s structure involved in the COII (Bryman & Bell, 2015, p.414). The interviews with these employees composed the basis to truly analyze openness within the COII.

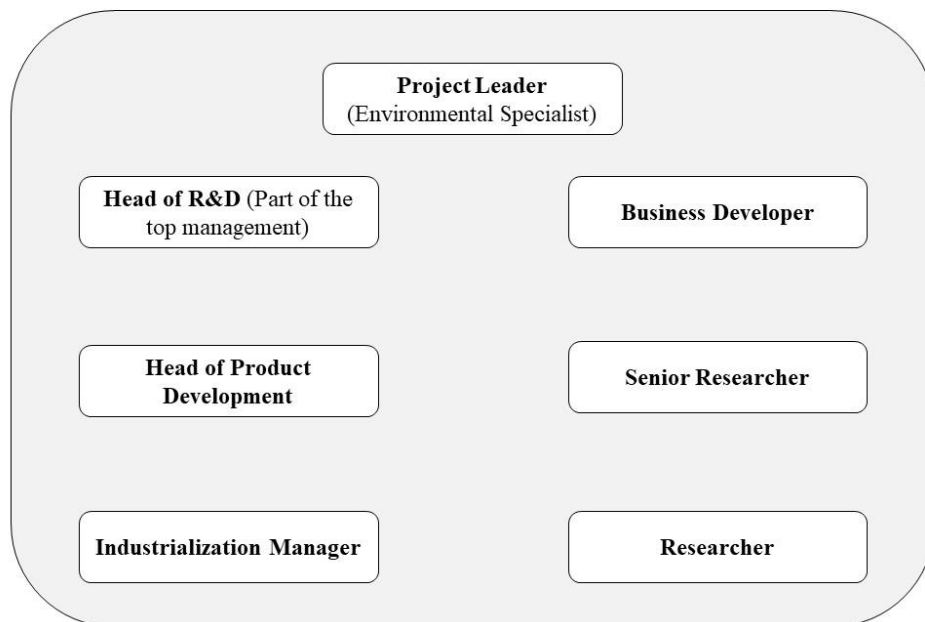


Figure 1. – The COII team

3.3.5. Interview guide

The semi-structured interviews of this case study were developed referring to the suggestions of Bryman and Bell (2015, p. 486). Following, the focus lies on studying the participants' view of the social world by using an ordered guide and research focus while remaining flexible during the interviews (Bryman & Bell, 2015, p. 486). The main body of the interview guide is distinguished by oldstream (2.) and newstream knowledge flows (3.). Accordingly, the formulated questions aim to bring the inside-out and outside-in knowledge flows to light.

In general, the research focus was specified by dividing the interview guide into three topic areas to ensure a good flow of questions (Bryman & Bell, 2015, p. 488). Subsequently questions focused on (1) Facesheet information, (2) oldstream knowledge flows, and (3) newstream knowledge flows.

The first topic area allows to compile background information of a general kind (name, gender etc.) as well as a specific kind (position, number of years employed, etc.) in order to contextualize the answers of the employees (Bryman & Bell, 2015, p. 488).

The second and third topic areas aim to study how the company generates inside-out and outside-in knowledge flows in the oldstream and newstream process (2.1., 3.2.). Particularly, the subset of COII (3.1.) emphasizes the functions of the incubator. Accordingly, the guide focuses on how the participation in the COII supports the case company to open up by generating more inside-out and outside-in knowledge flows.

3.3.6. Interview preparations

Face-to-face semi-structured interviews with employees were conducted in order to gain relevant insights. As Bryman and Bell (2015, p. 486) suggested the interviews took place in a quiet meeting room where external environment was not disturbing the interviews. Every interview was carried out by two interviewers, a passive and an active one. Due to this it was possible to see every information from two different perspectives, so it provided more valuable data (Bryman & Bell, 2015 p.487). During the interviews one interviewer was in the lead role and asking questions, while the other observed the interviewees in a passive role. Lastly, all the interviews were recorded and transcribed as these embody important building blocks of this research.

3.3.7. Ethical considerations

In order to assure the integrity and quality of the research the four ethical considerations by Bryman and Bell (2015, p.130) were taken into account.

Firstly, this study seeks to *avoid harm to participants*. Following the interviewees confidentiality and anonymity was kept in secret to avoid negative consequences caused by the information the interviews revealed (Bryman & Bell, 2015, p.135).

Secondly, this thesis aimed to achieve *informed consent*. All participants were informed about the research topic and process beforehand. Furthermore, interviewees were also asked for permission to record the interviews (Bryman & Bell, 2015, p.139).

Thirdly and decisively connected to informed consent this study *protects the interviewees right of privacy*. Following this study does not research beyond the agreed depth with the participants (Bryman & Bell, 2015, p.143).

Finally this thesis *provides the interviewees with information on the concrete subject* of the story and all relevant information about the research techniques used in advance in order to ensure a consent (Bryman & Bell, 2015, p.144).

3.4. Data analysis

As a side-effect of qualitative research, one of the main difficulties is the rapidly produced, unstructured material from interviews which is not easy to analyze in a transparent way (Bryman & Bell 2015, p.579). Bryman and Bell (2015, p.579) clearly emphasized the importance of a structured and transparent analysis to prevent possible failures to give the data wider significance than it actually contains. Therefore, this research applies a single-case analysis and a rigorous analytical framework provided by Gioia et al. (2012) to guide the qualitative data analysis. The approach presented by Gioia et al. (2012) is favored because it allows the reader to grasp how words, concepts and theory emerged from raw data in a credible and defensible way.

During the following lines, a systematic coding method is presented to increase the validity of the study and provide transparency to the reader. After the first screening, first-order category blocks from the semi-structured interview transcripts were developed (Gioia et al., 2012). The next step was to look for similarities and differences and find patterns among these category blocks to develop the second-order themes (Gioia et al., 2012). Even though these themes are

more abstract, interpreting concepts are starting to emerge during comparing them to each other and to existing literature (Gioia et al., 2012). The developed concepts lead us to “theoretical saturation” where the second-order themes finally collapse into aggregated dimensions (Gioia et al., 2012). The variety of dimensions provides this study with a comprehensive picture about the newstream and oldstream openness of the case company (Gioia et al., 2012).

On the other hand, one of the most common issues mentioned by researchers addresses that coding and the fragmentation of raw data encompasses the risk of losing the social setting or the narrative flow of what people said (Bryman & Bell, 2012 , p.597). Moreover, Gioia et al. (2012) describe the peril of “going native” which means to be biased by one interviewee’s perspective and therefore losing the higher level viewpoint. Accordingly, the authors of this study were eager to keep their minds objective and tentative during all the interviews to represent the situation as it is nowadays.

3.5. Validity and reliability

Bryman and Bell discussed the difficulty of measuring reliability and validity in qualitative research (Bryman & Bell, 2015, p. 399-400). Since the social circumstances of the underlying case analysis cannot be frozen to be replicated by other researchers, external reliability represents an issue in this study (Bryman & Bell, 2015, p. 400). However, a lot of research focused on open innovation and how incumbents struggle to generate inside-out and outside-in knowledge flows. Future research can focus on replicating the study by examining opening up processes within companies and the participation in institutions like the COII by adopting a similar social role in another case (Bryman & Bell, 2015, p. 400).

In addition, all semi-structured interviews of the research were conducted by two interviewers to agree upon what was seen and heard in order to assure internal reliability (Bryman & Bell, 2015, p. 400). Further detailed records of all phases of the research process were compiled to generate trustworthiness and transparency (Bryman & Bell, 2015, p. 403).

In relation to the internal validity of the study, the long observation and participation of the social world of the interviewees as well as the data analysis by Gioia et al. (2012) enabled to generate congruence between observations and theoretical ideas developed in the research (Bryman & Bell, 2015, p. 400). Furthermore, building theory in first- and second-order-analysis according to Gioia et al. (2012) ensures that personal values or theoretical inclinations do not

influence the outcome of this thesis and that the authors acted in good faith (Bryman & Bell, 2015, p. 403)

A further issue of qualitative research can be addressed with regards to external validity (Bryman & Bell, 2015, p. 400). However as already mentioned, the issue of opening up in order to benefit from open innovation applies to a lot of companies as discussed by existing literature. Hence this study is generalizable to other corporations that seek to open up their development process and foster open innovation. Moreover, the study gives thick descriptions of the uniqueness of the case company to allow other researchers to prove if the theory can be transferred to other cases (Bryman & Bell, 2015, p. 402).

Chapter 4. - Findings

In this chapter, the data structure evolving from the semi-structured interviews, is elaborated in order to bring light into the flows of knowledge that determine the case company's openness.

Firstly, the paragraph will present the aggregate dimensions that describe the past R&D efforts, potential organizational inertia and current R&D in order to emphasize the longitudinal character of the opening up process and to contextualize the role of the COII in the company's openness. Accordingly, the COII has to be viewed as a part of a new strategic direction that aims to open up the company's innovation processes and complement R&D with more open innovation activities.

Secondly, data present how inside-out and outside-in knowledge flows and therefore the openness is characterized in the oldstream or newstream process. Therefore, the main sequence of the underlying interview guide focused on emphasizing the situation in the newstream (COII) by utilizing the existing oldstream processes to contextualize knowledge flows in the COII. Finally, the data describe which enablers and knowledge practices influence the opening up process of the case company. To achieve transparency and a comprehensible structure in general, this research will apply the data structure method by Gioia et al. (2012). Accordingly, this study will show how concepts, themes and dimensions evolved from the raw data to analysis (Gioia, et al., 2012).

4.1. Contextual data

In order to understand the present openness of the company, the longitudinal part of data, its evolution and significance of the COII the following part introduces four contextual aggregate dimensions. Firstly, past circumstances of R&D are pinpointing various characteristics which explain the product development in the past. Secondly, organizational inertia is explained with giving a wide glimpse about the management mindset towards R&D as well as behavior of employees which likewise influences openness. Furthermore, through the last two aggregate dimensions collaboration is further discussed to reflect the transition of openness starting from the past until the current situation.

4.1.1. Past R&D

Despite of the fact that R&D is currently under transition, it is still important to show how it developed during the last years. Second-order themes are reflecting the four most important ankles of the aggregate dimension *Past R&D*. Incremental and product focused development was an effect of organizational inertia and early successes of the case company. Mostly due to the failures of the current innovation process the development of new products was characterized by a slow pace. Although the company initiated some collaborations, most products were developed internally. Due to limited IP management the company missed to capture value from internal inventions and lost patents to competitors. These factors all together framed the current openness of the company as it represented in Figure 2.

Incremental product development

R&D in the past focused on the development of products, which improve the current portfolio with incremental innovation. Accordingly, employees engaged in and prioritized product development that increased the efficiency and profitability. Additionally, interviewees stated that internal pressure to deliver products in a specified time frame and predefined launch dates lead to releasing insufficiently developed solutions.

Slow working processes

Findings pinpoint the fact that innovation processes slowed down product development. In addition, exploratory innovation was often endangered by managers who had a different vision and favored low-risk ideas. Furthermore, merging R&D with the market department resulted in actions, in which technical development was hampered by co-development with employees without technical engineering background. An interviewee concluded the situation by stressing that high internal bureaucracy and unnecessarily complicated guidelines for new products hindered many promising developments.

Closed development

Thirdly, closed development in the past also affected the situation around R&D nowadays. As a result of neglecting an IP strategy and therefore a focus on patent registration the company kept

everything as secretly as possible. Besides the necessary collaborations with suppliers, the R&D was characterized by internal development of products. These collaborations were also affected by a closed mindset, that was determined by the high level of secrecy in knowledge exchange with suppliers. Even employees from several departments were not allowed to visit the production sites of the company.

IP management

Various interviewees mentioned that the protection of IP was not a highlighted area in the past and that the company owns a relatively small amount of patents compared to its competitors. The company focused on keeping things secret instead. However, secrecy and IP protection was always dependent on the type of collaboration. Accordingly, the case company applied a more rigorous protection in collaboration with big corporations, but usually used NDA's within smaller partnerships. Another important distinction can be identified in responses stating that the company is more willing to reveal knowledge when issues are not related to the core business. Moreover, interviewees emphasized that poorly managed IP led to drawbacks in capturing value from innovation. Due to the lacking patents on a successful core product the competition was able to patent it faster than the company, so the company had to stop using the technology it once developed internally.

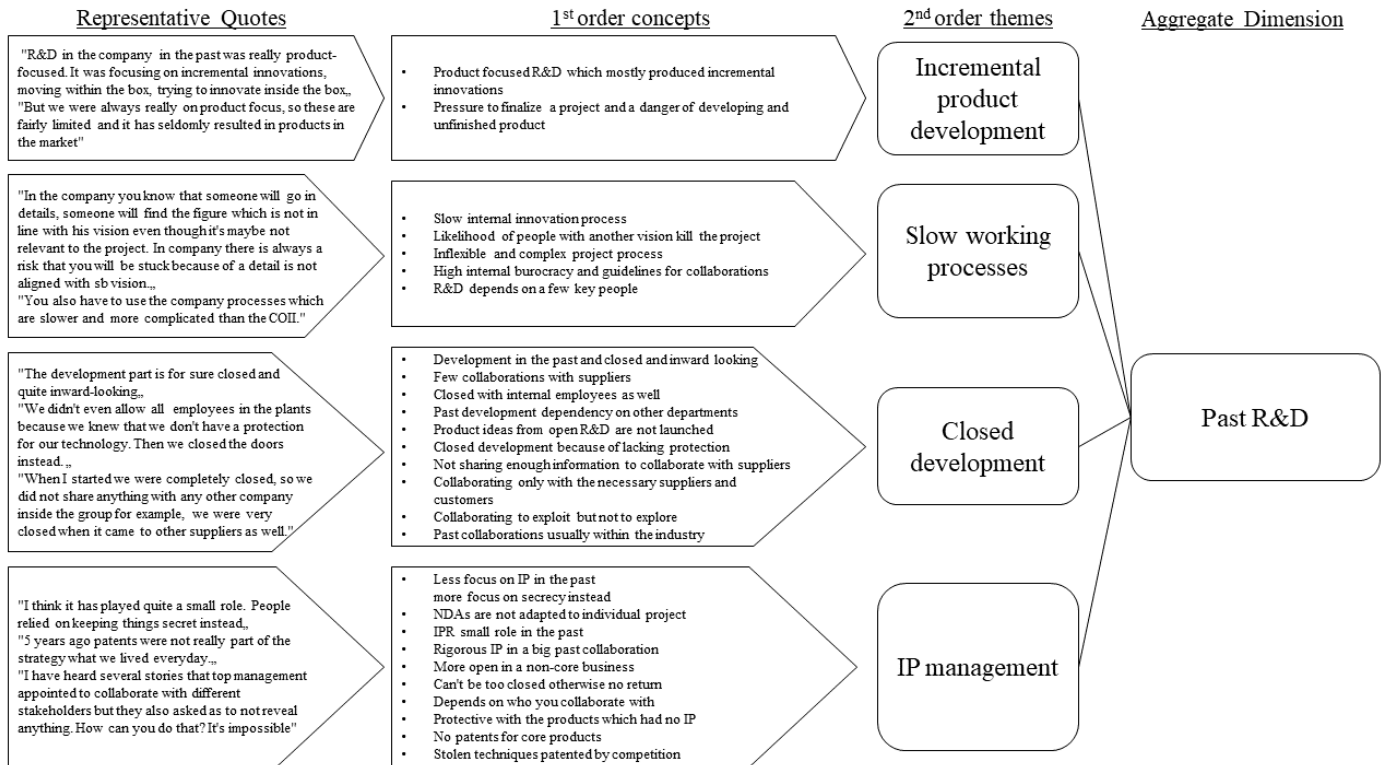


Figure 2. – Past R&D

4.1.2 Organizational inertia in the case company

In line with the definition of organizational inertia presented by Sull (2005) interviewees mentioned that the company is stuck in its past way of thinking and working, which used to be very successful (Figure 3.). Accordingly, change towards new developments is hampered. Since the company was closed and inward looking in the past, inertia is a major factor that determines the current situation in open innovation. Different factors and causes of organizational inertia will be presented through second-order themes. With regards to this complex processes, traditional management practices and employee behaviour are all crucial, because these factors are usually responsible for a closed process with regards to R&D and open innovation.

Favoring traditional business

This theme was stressed by several interviewees. The company is stuck in its way of doing business. The data also pinpoints that this way of working is determined by extensive double

checking and measuring everything in advance which is not appropriate in projects with high uncertainty. Moreover, the management prioritizes incremental projects which embody low risk. Additionally, the opinion towards projects that are not-related to the core business was characterized by fear and mistrust.

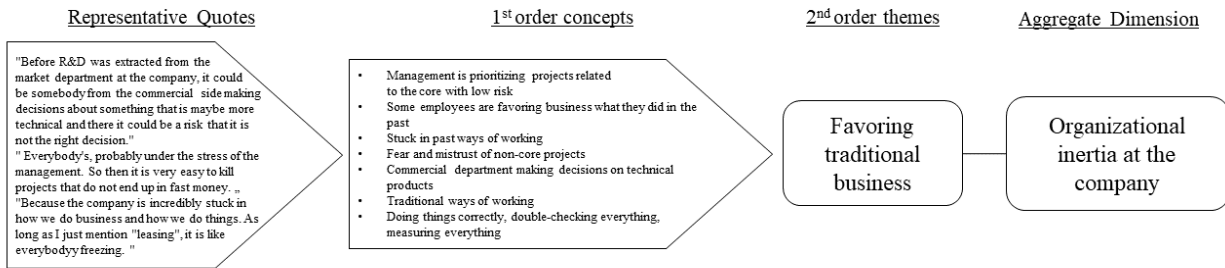


Figure 3. – Organizational inertia at the company

4.1.3. New R&D strategy

In this aggregate dimension collaboration partners and a new R&D direction will be presented in order to introduce the ongoing transition of the company to the reader (Figure 4.). After the arrival of a new CEO the strategy was newly formalized with the aim of opening up the company to the external environment. Following this paragraph presents three second-order themes that will further elaborate on different types of collaboration, the leading role of the new R&D director as well as the process of opening up the company itself.

Collaboration

Despite inward-looking R&D in the past the case company was involved in different collaborations. In these the firm mostly engaged with companies within their value chain, for example suppliers. Moreover, the company collaborated in a few projects with architects and other construction companies. However, interviewees agreed upon the fact that the case company is not collaborative and development of new products has always been more closed.

Opening research

With the new strategic direction, the product development process slowly opens up. Accordingly, interviewees stated that the company is transforming from complex processes and

strict guidelines to being more flexible and unstructured. The separation of R&D from the market department is also fostering this opening process by giving more freedom to the researchers through disconnecting them from the former rigid policy.

New Head of R&D

This second-order theme refers solely to the new path led by the recently hired Head of R&D. Almost all interviewees mentioned his leading role in the ongoing process of opening up and in the growing importance of innovations. The most commonly stated aspects are the accelerated speed of R&D and closer work with external institutions.

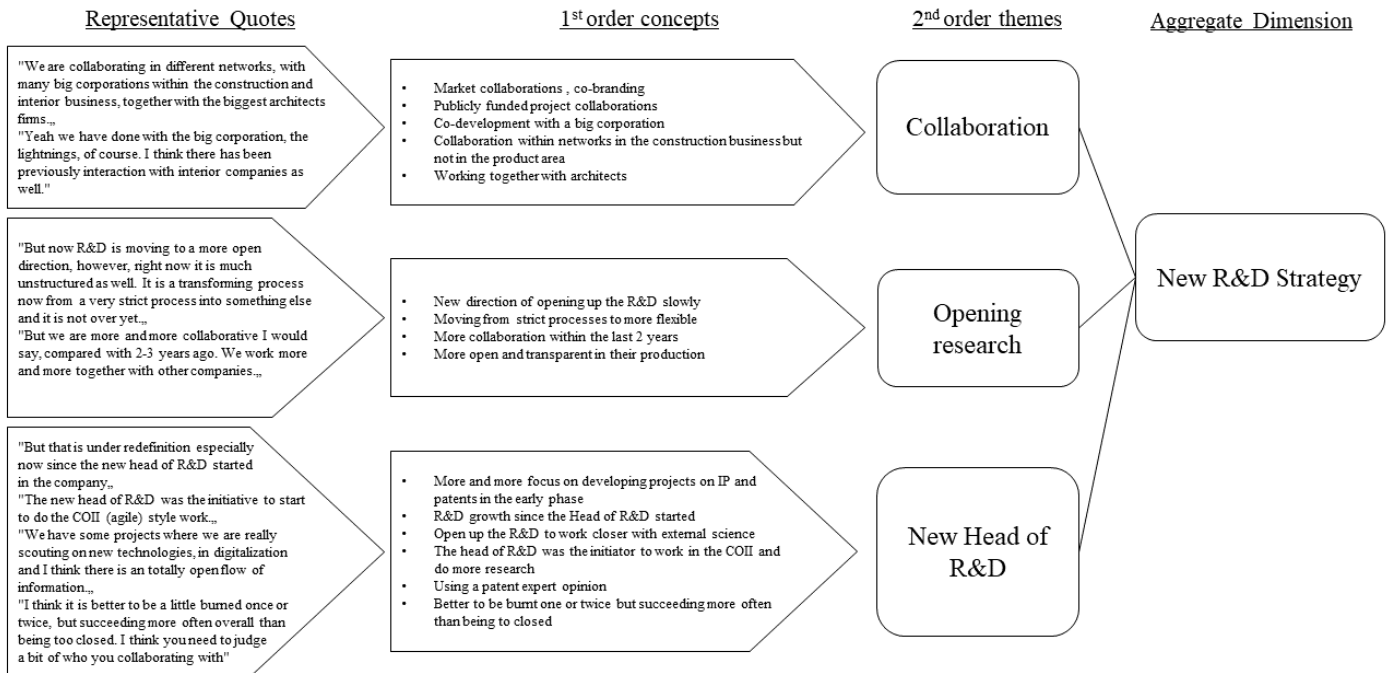


Figure 4. – New R&D Strategy

4.1.4. Incubatees in the COII

The following aggregate dimension elaborates on other incubatee companies within the COII (Figure 5.). The data are remarkable, because the interviews show that both similar and different aspects among the incubatees are influencing the knowledge flows of the case company. These will be further discussed in the ensuing paragraph of the thesis. In addition, a major difference

between the COII and previous collaborations is the number of knowledge sources per collaboration, which will be highlighted as well.

Same challenges in different companies

The COII connects the case company with other corporations from different industries. The collected data shows that the incubatees share similar challenges, especially in relation to the aim of exploring new ways of working and how to execute radical innovation. The diversity of the COII was also stressed. Therefore, different companies with different perspectives are able to provide and share useful knowledge. Accordingly, the companies share and face similar challenges, for instance internal communication challenges. Following the incubatees are very open about the challenges they face with the project in the COII.

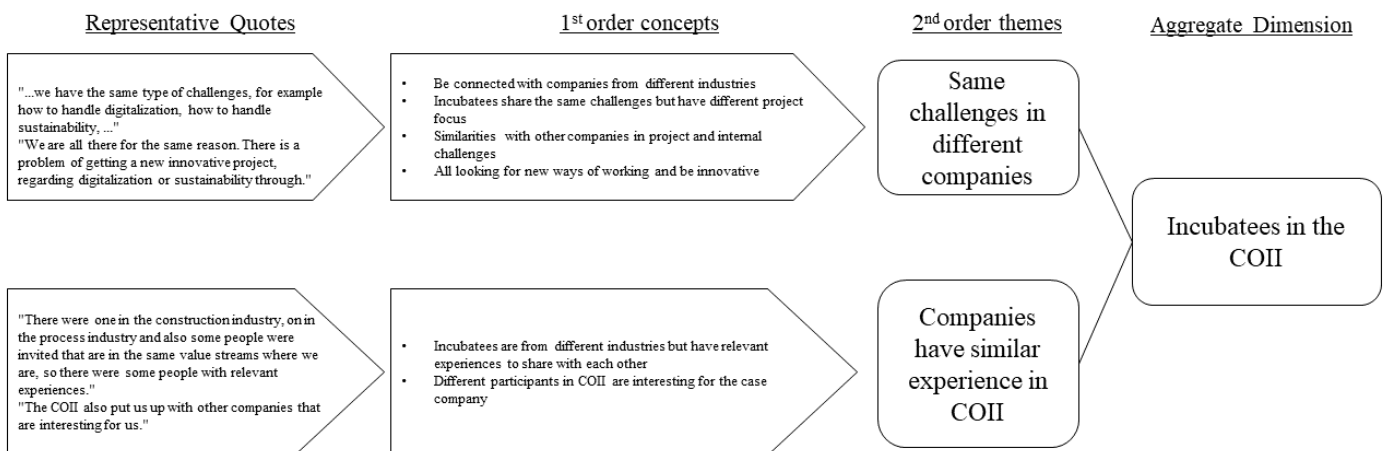


Figure 5. – Incubatees in the COII

4.2. Outside-in knowledge flows

4.2.1. Oldstream outside-in knowledge flows

This aggregate dimension presents how the case company generates outside-in knowledge flows in oldstream collaborations (Figure 6.). The results show that most of the open innovation collaborations aimed to deliver *product based knowledge flows* and that these knowledge flows are generated through specifically defining what is expected from the supplier, partner or customer, which which is introduced in the second-order theme *pre-determined knowledge flows*.

Product based knowledge flows

In relation to outside-in knowledge flows in collaborations interviewees stated that the case company profits from solutions that are improving product parts of the existing portfolio (E.g. a new colorway produced by a supplier). Accordingly, the main insights embodied technological information for product components. This technical knowledge related to the core business was achieved through asking suppliers or partners really detailed questions about product specifications that can improve the quality.

On the other hand, results show that the case company also engaged in collaborations where they gained knowledge in business areas that are not related to their core products (E.g. aspects of digitalization in collaboration with architects).

Pre-determined knowledge flows

This second-order theme describes how the knowledge flows in open innovation collaborations are determined before the actual exchange of knowledge. Following the case company specified what kind of solution is expected by the supplier, customer or partner in advance. Moreover, results show that the case company develops most of the new products in-house and therefore again the focus lies on solutions related to the core business.

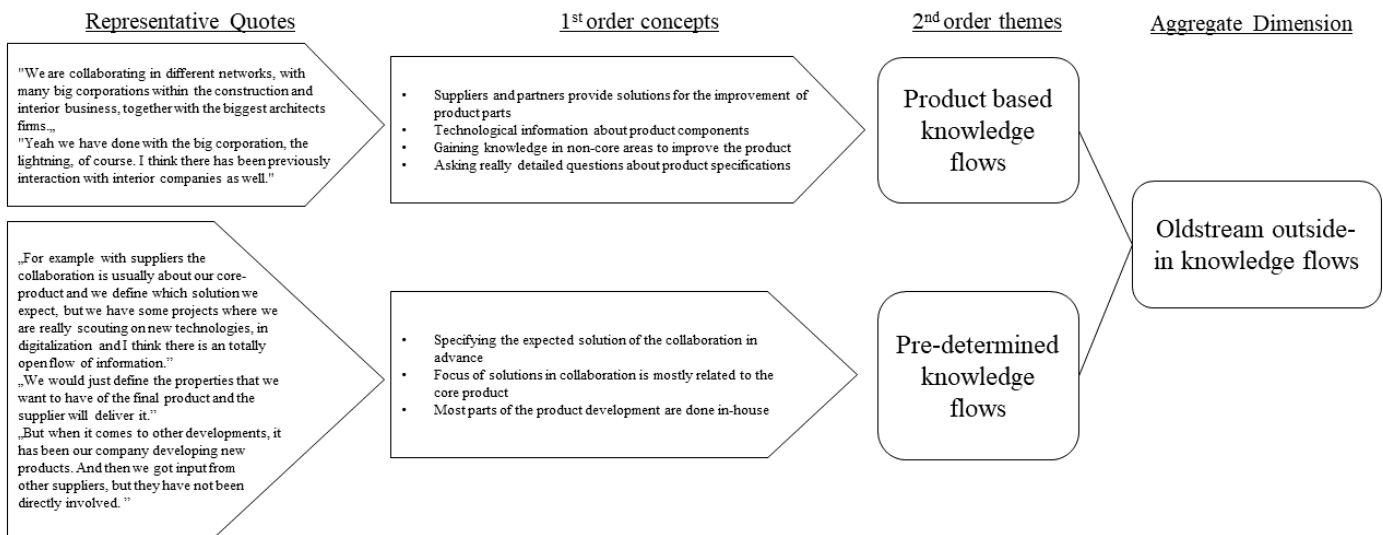


Figure 6. – Oldstream outside-in knowledge flows

4.2.2. Newstream outside-in knowledge flows

This aggregate dimension pinpoints which outside-in knowledge flows are generated through the participation in the COII (newstream). Accordingly, this section will initially present *realizing the necessity of change in R&D*, secondly depict on *internal departments benefitting from the COII*, thirdly describe the *COII effect on personal development* and finally elaborate on *knowledge from incubatees* (Figure 7.).

Realizing the necessity of change in R&D

This second-order theme describes the change in the state of mind of employees especially related to the execution of innovation. Being more agile, under shorter decision processes and having more ownership in decisions, brought the benefits of different ways of working in open innovation to light. Accordingly, the employees of the case company realized that change is necessary to be more innovative.

Knowledge flows to internal departments

The fact that internal departments can leverage on the knowledge generated by employees in the COII, especially related to new approaches in the way they innovate and develop new products, is represented in this theme. Moreover, the interviewees stated that the takeaways from the COII create ideas and enthusiasm for future work.

Personal development

Besides the benefits for internal departments the participation in the COII also affected the personal development and therefore generated outside-in knowledge flows for the employees in the incubator. Accordingly, people transformed from being reluctant to being open for new things and learned new methods and ways of working with innovation. Interviewees stated that they have changed their mindset within the COII. Additionally, the data gives more insights into newly acquired knowledge in approaching challenges and problems. Further, the findings depict on the fact that employees have higher trust and believe in themselves and their work. Moreover, they felt empowered by the different way of working.

Knowledge from other incubatees

This second-order-theme presents how the case company leveraged knowledge from the other incubatees. Following the company gained knowledge through open discussion about challenges and solutions in their project. This is also represented by the fact that all incubatees are well informed about the respective scope and direction of the other incubatees projects. Additionally, all interviewees stated that the companies within the COII benefit from exchanging ideas, past experiences and feedback in pitch events or workshops. Thus, this helped the case company to improve prototypes or ideas and to make better decisions in the end.

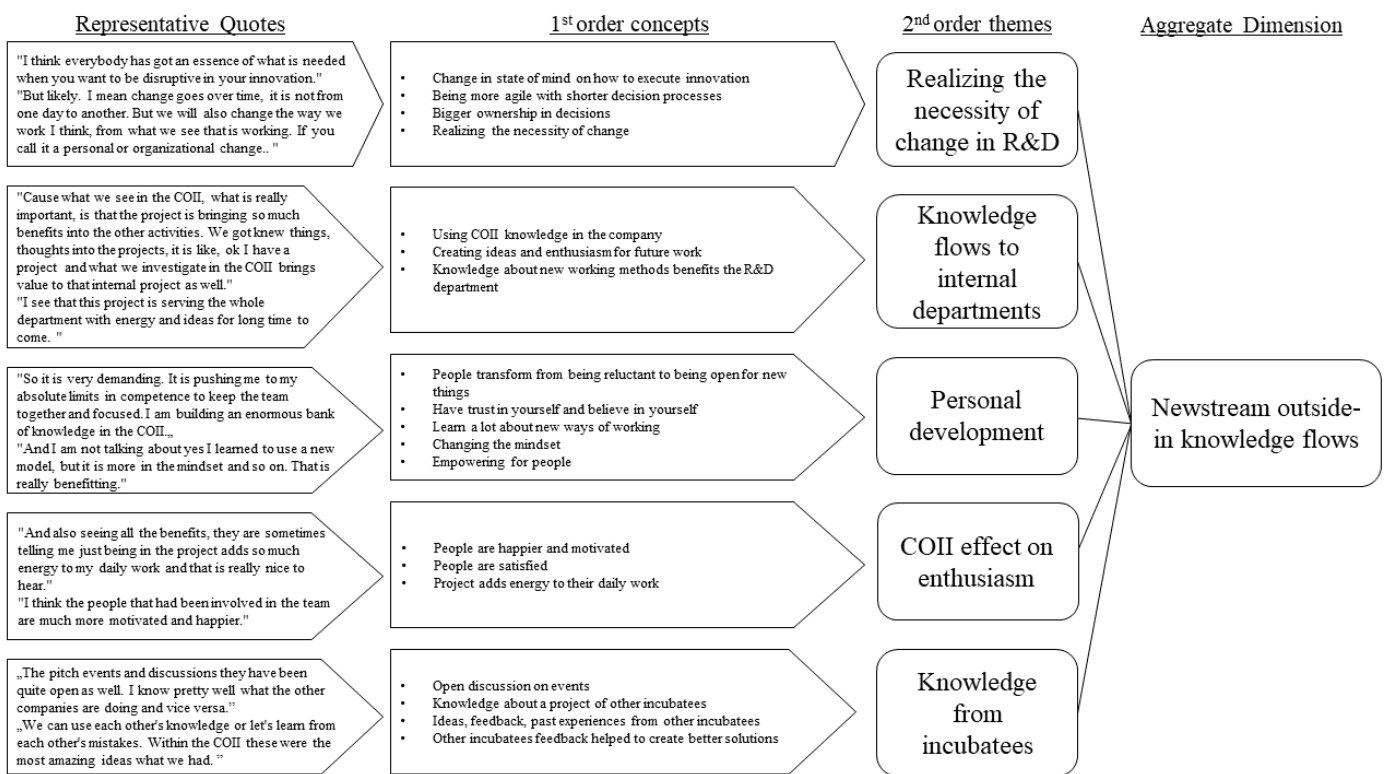


Figure 7. – Newstream outside-in knowledge flows

4.3. Inside-out knowledge flows

4.3.1 Oldstream inside-out knowledge flows

This aggregate dimension will elaborate on the inside-out knowledge flows, notably when the company revealed knowledge during their oldstream open innovation activities (Figure 8.). It will cover four key second-order themes which focus on how the firm used agreements, patents, guidelines to manage inside-out knowledge streams.

IP protection

The most common protection mechanism referred by the interviewees is to use NDA's in a collaboration. Accordingly, the general aim of NDA's is usually to keep the ownership of ideas within the company. This protection mechanism sets in as soon as information in the knowledge flow get sensitive.

Knowledge revealing

This second-order-theme brought to light, that the case company actively aims to secure IP in areas related to the core business, but is less active in businesses that are unrelated to it. Additionally, employees are very careful about what to reveal in open innovation, especially secret technical specifications. Moreover, data shows that the companies openness in terms of inside-out knowledge flows also depends on the collaboration partner of the company. Subsequently, the collaboration type determines how much knowledge they reveal in open innovation. Therefore, the case company estimates the likelihood of a competitor accessing sensitive information in open innovation beforehand.

Knowledge revealing guidelines

As interviewees pointed out, they are eager not to share more information than necessary to make the collaboration work. In that relation, management requires employees to reveal as little as possible, so people are really careful with revealing knowledge which might be sensitive. Although, written guidelines are less common, employees try to remain as secret as possible in open innovation.

IP management

Since a new R&D strategy has been defined and a new Head of R&D has been hired the case company made changes in its IPR strategy. Accordingly, interviewees emphasized the new focus on registration of patents and pinpointed the value of protection and patents as a crucial part of defending the firm's own knowledge. Therefore, weekly meetings are held to discuss possible areas of patent registration. Finally, interviewees stated that the company established a new IP strategy in the last 5 years and therefore aims to register more and more patents in the future. The

planned implementation of the number of generated patents to measure innovation performance reflects this strategic direction.

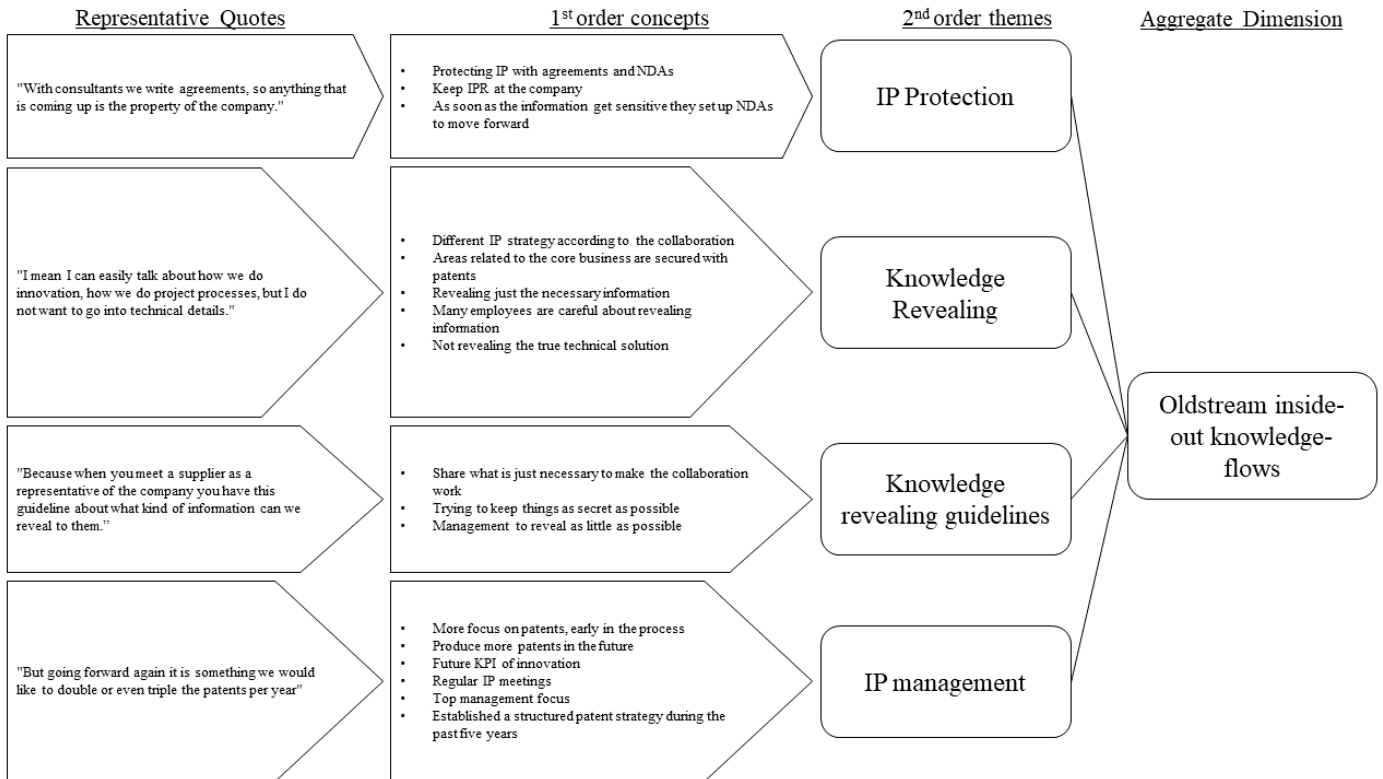


Figure 8. – Oldstream inside-out knowledge flows

4.3.2 Newstream inside-out knowledge flows

This aggregate dimension describes how inside-out knowledge flows are generated in the COII (Figure 9.). Accordingly, the data present how the case company reveals or rather protects knowledge in the COII.

Patenting

The case company aims to secure intellectual property in a form of patents as early as possible in order to own knowledge created in the incubator. Moreover, three of the employees in the COII were involved in patent management during their regular jobs before and could therefore share their experiences in discussions. Subsequently, employees try to assure if a patent could be registered with the internal department as soon as an idea comes up. However, data also presents

that the case company openly talks about solutions in a meeting with other incubatees and signs NDA's afterwards to assure that intellectual property is protected.

Knowledge revealing of the company

Firstly, interviewees highlighted the fact that they are more open or differently open within the COII due to several reasons. The project is on a different level than usual project innovations of the company, so people can share their challenges, ideas and feedback freely with other companies in the COII environment via pitch events. In that relation, employees reveal their ideas and challenges but not solutions. Consequently, interviewees stressed that trust is higher, since other incubatees are from a different industry. Additionally, companies have a common oral agreement that the project aim of the respective COII participants is not revealed to third parties outside of the incubator. Yet, the data emphasizes that employees prevent to share the exact technical specifications that could be captured by competitors.

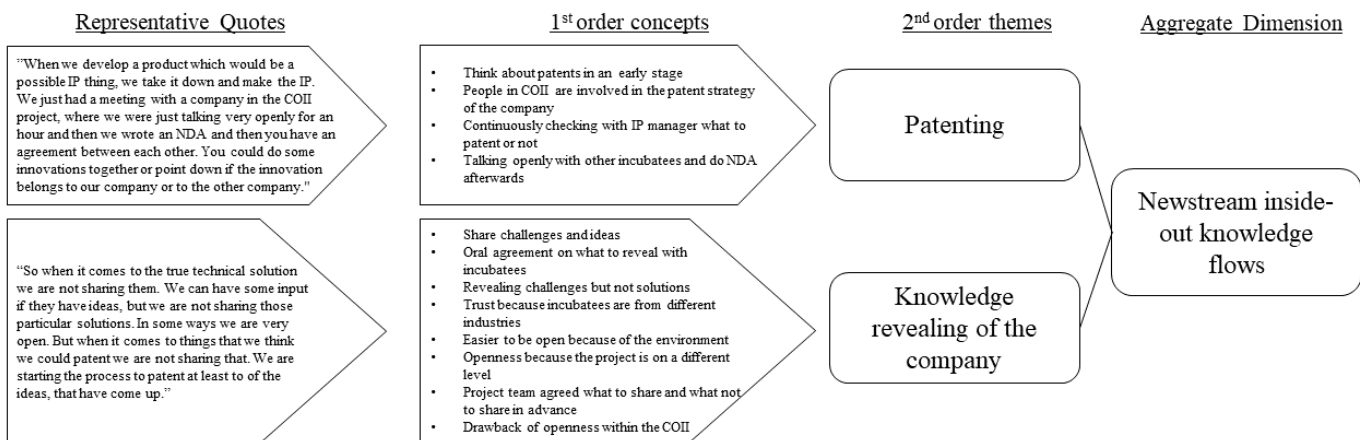


Figure 9. – Newstream inside-out knowledge flows

4.4. Knowledge practices and enablers

Lastly, two data sets will be presented, both supporting the previously mentioned newstream knowledge flows. Based on theory from Armbrecht et al. (2001) we divide them into enablers (Figure 11.) and knowledge practices (Figure 12.) as two separate aggregate dimensions. While enablers should be viewed as factors which enable openness, knowledge practices are various methods fostering knowledge flows and knowledge creation.

4.4.1. Enablers

An enabler is a “conceptual tool used to describe a process or asset that allows an organization to achieve its objective” stated by Armbrecht et al. (2001). In this research enablers are elements which create the environment for knowledge creation, acquisition and transfer, namely openness.

Allocation outside of the company boundaries

Interviewees specified that the COII incorporates a kind of freedom outside of the company boundaries, where no one from the internal departments can interrupt the project. Moreover, the data show that isolation from headquarters is partly liberating, characterized by different rules and facilitates the employees ability to focus on the project.

Breaking Silos

This second-order theme brought to light, that the COII breaks up silos, due to the cross-functional teams from different departments that have been selected to foster the development of the project with their various competencies.

Freedom

Moreover, the results indicate that employees in the COII, work under a freedom of thought and can individually decide how to tackle certain problems and find necessary solutions.

Small teams

This second-order theme depicts on the small size of teams working in the COII. Due to the small number of employees, decisions can be made without difficulty and the goal of the project can be aligned easier.

Decision-making

Interviewees emphasized that decision making in the incubator is characterized through informality, speed and independence. Decisions can be taken without allowance from management in the headquarter, which simplifies and accelerates the process.

Less hierarchy and equality

Moreover, decisions in the COII are determined by equal idea evaluation through the usage of scorecards. Additionally, complete honesty about possible challenges of the project and trust in the ability of other team members determine an environment of flat hierarchies and a family feeling in the team.

Encourage knowledge sharing

Furthermore, interviewees depicted on the advantage of a culture that engages to share knowledge between the incubatees. Accordingly, the COII facilitates to get in and share different knowledge perspectives in relation to possible ideas and solutions via networking and mingling. This is especially reflected in regular pitch events, where incubatees give feedback to the opponent companies.

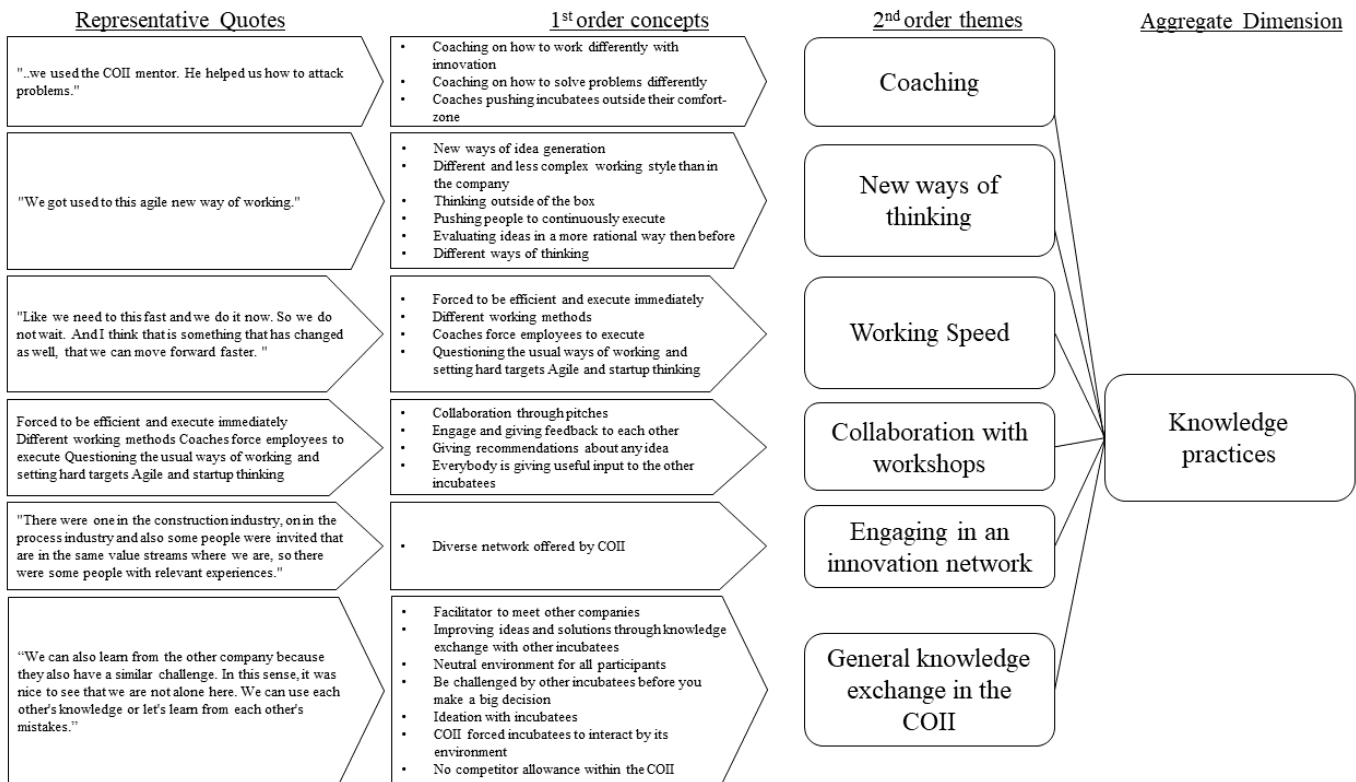


Figure 10. – Knowledge practices

4.4.2. Knowledge practices

Various practices are presented within the following aggregate dimension, which are all fostering knowledge creation and openness via knowledge flows. Seven second-order themes are presenting different knowledge practices which support the above mentioned process.

Coaching

Coaches within the COII trained the employees on a different way to help them solve problems creatively. Accordingly, coaches work as a facilitator to execute innovation processes and new product development in other ways. Additionally, the data depicted on the fact, that the work in the COII and mentors constantly challenged the incubatees by pushing people to leave their comfort-zone and to solve problems immediately for example by hitting the phone to get the necessary information to move forward.

New ways of thinking

Interviewees stated that participation in the COII encouraged them to utilize new ways of idea generation and to think outside of their current working processes in the case company. Moreover, the working style itself is characterized by less complexity and brought different ways of thinking and learning to light. Furthermore, the usage of a rational tool to make Go/No-Go decisions on ideas, highlighted new perspectives of idea evaluation.

General knowledge exchange

As the COII facilitates meeting other companies from diverse industries, it engages the companies to exchange knowledge and opinions. Subsequently, the case company also generates more ideas, through the inspiration by other participants. The interviewees argued that this is also fostered by the neutral environment that the companies are working in. Moreover, data shows that companies continuously challenge each others ideas and can therefore help the case company to find the right direction before making a big decision. Interviewees stated that they openly share ideas and get in different knowledge perspectives and feedback in return. The COII coaches continuously force the incubatees to challenge other ideas and therefore increase the interaction and knowledge exchange. However, it is important to mention, that in one occasion a

competitor of the case company was excluded from as discussion to not reveal sensitive knowledge.

Working speed

This second-order theme emphasizes that the working methods used in the COII, forced incubatees to be efficient and execute on challenges and ideas immediately. By utilizing agility similar to a startup and setting high targets, the speed of working was accelerated within the incubator.

Collaboration with workshops

The open feedback and recommendation about new ideas was given in idea storms and pitch workshops in the COII. In these workshops the incubatees collaborated and helped each other to improve and create a better solution via ideation. The data also describes that the incubatees could use each other's knowledge, learnings and mistakes to reach this improvement.

Engaging in an innovation network

Besides pitching workshops, the COII provided incubatees with an engaging innovation network, which enabled them to meet people they would not meet within the company boundaries. This brought in diverse perspectives and knowledge exchange.

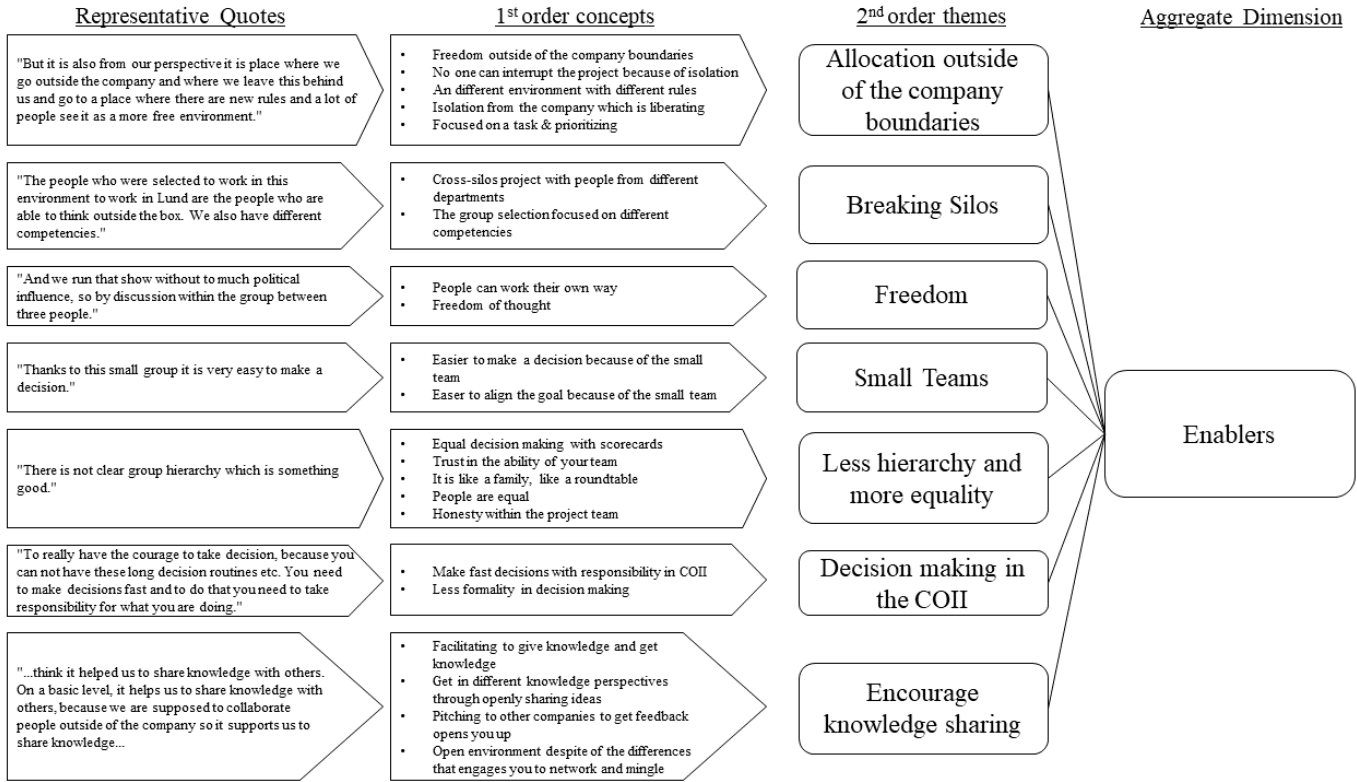


Figure 11. – Enablers

Chapter 5. - Discussion

The ensuing chapter analyzes the difference between knowledge flows within the COII (newstream) and within the case company (oldstream). Moreover, the relationship between openness and contextual information as well as enablers and knowledge practices is further emphasized. Therefore, the goal of this part is to answer the question how the COII can support a company to open up. The discussion is presented through three main parts, where the first two parts are about outside-in and inside-out knowledge flows in newstream and oldstream. Since enablers and knowledge practices along with contextual information are influencing these flows, these are essential building blocks of the analysis as well. Finally, a framework illustrates relations between the above mentioned elements in the COII.

5.1. Outside-in knowledge flows

According to the oldstream second-order themes *product-focused* and *predetermined knowledge flows* the case company influences possible knowledge flows by determining exact specifications of the expected outcome of open innovation collaborations. Therefore, the outside-in knowledge flows are limited to solutions on parts of the developed product, which are mostly related to the core business. This focus accordingly hampers openness (Gassmann & Enkel, 2004). With regards to this one interviewee stated: *“We would just define the properties that we want to have of the final product and the supplier will deliver it.”*

On the other hand, the company generated outside-in knowledge flows in open innovation collaboration in areas that are not related to the core business and recognized the benefits of various knowledge sources, namely the external search depth (Laursen & Salter, 2006). As one interviewee pinpointed: *“And in this one we collaborated with architects from the beginning, who are very much into digitalization. And that has really helped us to gain knowledge from someone that has actually more knowledge in one field that is totally new to us.”*

However, knowledge flows in most collaborations are determined by the fact that most parts of the actual product development are executed by the company. Therefore, one interviewee stated that outside-in knowledge flows could be increased by giving customers more influence in the product development to broaden external search breadth (Laursen & Salter, 2006): *“But maybe we do it when we already have the idea. We decide that we need 10 new colors and then we hire an architect or designer who is good on colors. Maybe we could be better on saying we want to*

go for something that is totally new for us and that we should ask the architects what to develop to improve our product.”

In comparison, the newstream outside-in knowledge flows are characterised by developing new products in collaboration with the COII mentors as well as the other incubatees from different industries. In addition, the COII embodies further knowledge flows besides knowledge flows about the development of a new product. Moreover, collaboration with the COII trainers in the form of trainings and coaching fosters knowledge flows about new approaches to tackle innovation as well as a new mindset of the involved people which embodies in a cultural change (Armbrecht et al. 2001). In that sense one interviewee described these knowledge flows: *"I think everybody has got an essence of what is needed when you want to be disruptive in your innovation."* Moreover, another respondent described the created knowledge flows in relation to the new approach learned in the COII: *"I mean one thing that we are doing is that when we are in the COII it is a project we are working on and if we have to make a phone call, we just make the phone call right now. So, I think that is also one kind of state of mind that has changed a bit. Like we need to this fast and we do it now. So we do not wait. "*

Furthermore, the case company accessed new knowledge flows in form of ideas, inspiration, feedback and insights about past mistakes, which are provided via various events together with other incubatees. These workshops and pitch-events represent knowledge practices in line with Armbrecht et al. (2001). In addition, involving diverse knowledge sources creates a wider external search depth which is further fostering openness (Armbrecht et al., 2001, Laursen & Salter 2006)

The outside-in knowledge flows, whether they originate from the COII employees or incubatees, further flow into internal departments. Accordingly, one interviewee elaborated on the benefits created by these flows: *"Cause what we see in the COII, what is really important, is that the project is bringing so much benefits into the other activities. We got new things, thoughts into the projects, it is like, ok I have a project and what we investigate in the COII brings value to that internal project as well."*

In line with the elaborated comparison a higher amount of knowledge flows is created within the newstream (COII). The following paragraph will further demonstrate how this is fostered by knowledge flow enablers and knowledge practices.

Firstly, both streams can be distinguished by the assessed knowledge and the amount of created knowledge flows. According to Chesbrough (2003), companies that engage in open innovation seek to generate more knowledge flows in outside-in processes. Besides the collaborative creation of a new product which can be found in both streams, the newstream enables companies to access more outside-in knowledge flows in form of ideas, inspiration, feedback and insights about past mistakes provided by other incubatees as well as knowledge of new approaches to innovation and the necessity of change. Moreover, the access of more knowledge flows is a necessity for companies since they do not have the resources and competences to merely innovate in-house and seek to minimize the risk by using collaboration (Chesbrough, 2003).

These knowledge flows are fostered by the enablers like culture and structure (Armbrecht et al., 2001). From a cultural perspective outside-in knowledge flows are enabled by the knowledge exchange between the incubatees, especially through and second-order theme *encourage knowledge sharing*. According incubatees are encouraged to collaborate, interact, teach and learn from each other (Armbrecht et al., 2001). Otherwise, structural enablers are identified the second-order-theme *importance of being outside company boundaries* as a form of external learning environment, *break silos in the COII* as representing diverse cross-functional teams with responsibility given to the individuals, and *less hierarchy and more equality in the COII* as a form of eliminating organizational layers (Armbrecht et al., 2001).

With regards to Armbrecht et al. (2001) the COII also fosters outside-in knowledge flows by incorporating knowledge practices as already highlighted. Firstly, the diverse network with incubatees from different industries are described by the second order-theme *engaging in an innovation network* (Armbrecht et al., 2001). Secondly, the knowledge practice sharing, learning and ideation is allocated in the second-order themes *collaboration in workshops*. For instance, the pitches and the connected feedback by other incubatees create additional knowledge flows in the COII. In that relation one interviewee stated: "*We have done that in different occasions. We have done some pitches for example, where you have to pitch your project idea for example. And then they give input and we have done that in several different occasions and with different ideas. So we get input and other perspectives on the ideas that we have.* "

Thirdly, the knowledge practice training fosters inbound knowledge flows through special mentoring (Armbrecht et al., 2001). This is typified by the second-order theme *Coaching and Mentoring in the*

COII, which comprises the special coaching on new methods to innovate and problem solving in the *COII*.

Furthermore, the knowledge exchange between three different companies as well as the *COII* employees (E.g. trainings and workshops) allows companies to access more and different knowledge sources than in the oldstream, which was determined by collaborations with single companies. According to Laursen and Salter (2006) this external search breadth and depth defines the number and variety of external sources that firms rely on to open up innovation process. Following, the higher number as well as more diverse sources in the *COII* creates more outside-in knowledge flows and accordingly increased the degree of openness in companies.

In summary, this section described the significantly higher degree of openness within the newstream outside-in processes. Above all, the enablers, knowledge practices as well as external search breadth and depth clarified how the participation in the *COII* supports this higher degree of openness. In order to get the full understanding of openness, the ensuing section analyzes inside-out knowledge flows by contrasting newstream and oldstream processes.

5.2. Inside-out knowledge flows

According to the data on inside-out knowledge flows in the newstream and oldstream process and in line with the theory developed by Gassmann and Enkel (2004) the case company is not revealing more sensitive knowledge to other incubatees in the *COII*. Empirical studies have consistently pinpointed that companies perform more outside-in than inside-out activities (e.g., Chesbrough and Crowther, 2006; Bianchi et al., 2011; Cheng and Huizingh, 2010; Chiaroni et al., 2011). Following, these studies argued that the neglect of inside-out knowledge flows can be explained through historical reasons, the possibility to use already existing relationships, and fearing to diffuse sensitive knowledge or even losing corporate “crown jewels” that build the foundation of a core business (Rivette and Kline, 2000; Kline, 2003). Newstream and oldstream data shows that employees are not sharing true technical solutions with partners or incubatees in equal measure. A repeatedly mentioned quote among the interviews is that they are “*talking about the what, not the how*”. Similar data emerged from questions about IP and knowledge protection. With relation to R&D and IP management in the past the company neglected a

knowledge protection strategy and therefore had to rely on secrecy. This is also represented by quotes stressing that even some employees of the company were not allowed to enter the production sites. Following one interviewee described: *"We didn't even allow all employees to enter the plants because we knew that we don't have a protection for our technology. Then we closed the doors instead."*

Due to this kind of protection a certain kind of closed mindset, concealment and political behavior took place within the boundaries of the company which are reflected through aggregate dimensions *Past R&D* and *Organizational Inertia*. As Armbrecht et al. (2001) stated this kind of secrecy is a good soil for a culture that hinders knowledge flows and openness. One explanation for a hindering culture within the case company is represented by drawbacks of the lacking IP management in the past. After losing sensitive knowledge to a competitor the company placed patenting and NDA's high on the agenda. In line with that one interviewee elaborated: *"It has also happened that some things were made first by us but were not protected and someone else did it and patented it so we cannot use it."* On the other hand, the new IP strategy was emphasized as well: *"IP is a part of the weekly meetings, it is always there. We had IP strategy meetings as well."*

The case company handles revealing and protection of knowledge within the COII in line with the general IP strategy. Therefore, the IP strategy remains unchanged in the newstream as described in the second-order theme *Patenting*. Since the start of the incubator program employees focus on the registration of IP and therefore try to patent products in an early stage of the project. With regards to that, one interviewee stressed: *"The Head of R&D suggested to stop for a minute, think about our ideas and ask our Patent manager what can we patent from these ideas in the COII."* This focus is embodied in frequent consultancy by the patent manager of the company and regular IP protection discussions within the team. In relation to the openness defined by Gassmann and Enkel (2004), the COII does not facilitate knowledge flows by revealing more knowledge that might be sensitive. A reason for the unchanged openness in that relation could be that changing an organization to engage in more inside-out knowledge flows is hampered by organizational inertia, which is also represented by the findings of this study

(Chesbrough & Crowther, 2006). Additionally, the newly introduced IP strategy with a focus on patent registration could inhibit revealing knowledge in the COII (Laursen & Salter, 2014).

However, employees mentioned that they are more open in the newstream process despite of the fact that the focus on IP and revealing knowledge remains unchanged within the COII. As one employee pinpointed, that additional inside-out knowledge flows are generated: *“We can have some input if they have ideas, but we are not sharing those particular solutions. In some ways we are very open.”*

Consequently, the data illustrate the following factors - also reflected in aggregate dimensions *Knowledge Practices* and *Enablers* - which both can justify the above mentioned statement. In workshops and events within the COII, where incubatees give feedback, share ideas and their past mistakes with each other, knowledge flows are facilitated. In other words, and in line with the described theory of Gassmann and Enkel (2004) these workshops and events are generating a number of knowledge flows which are facilitating openness. With regards to Ambrecht et al. (2001) these workshops and shared ideation events are among the knowledge flow practices which can boost openness. On top of that, these knowledge flows are affected by another determinant which is related to the type of collaboration partners. This goes in line with the theory by Laursen and Salter (2006), which elaborates on the fact that companies that collaborate with heterogeneous partners in open innovation achieve a higher degree of openness. While the company always collaborated with players from its value chain, the collaboration partners within the COII are coming from different industries. Hereof, one interviewee described the collaboration in the COII as follows: *“So we have two other incubatees. One is pretty far from our business, but still, they are facing the same type of challenges. We can also learn from the other company because they also have a similar challenge. In this sense, it was nice to see that we are not alone here. We can use each other's knowledge or learn from each other's mistakes. This COII was one of the most amazing ideas what we had.”*

As Ambrecht et al. (2001) stated networks with different industrial backgrounds can bring together a large and wide base of knowledge and therefore foster knowledge flows. Likewise, sharing experiences and past mistakes between industries related to running or developing

businesses are also beneficial, since diverse experiences gives access to different knowledge sets (Bollingtoft, 2012). Thus, employees are not feeling the same level of risk when they are collaborating with firms which are competing in another industry. Moreover, ideas, feedback and experiences within these workshops are flowing in between more knowledge sources, compared to two-sided oldstream collaborations. Therefore, the company has a wider external search breadth. With regards to Laursen and Salter (2006) a company achieves a higher degree of openness from these wider and deeper collaborations.

Furthermore, a difference in the work environment can also support inside-out openness. Several employees pinpointed the distinction between the COII and the case company and following the advantages of being outside the company boundaries. One interviewee stated: *“The COII is truly inspiring because we come outside of the company, which is not the most inspiring place on Earth.”* Furthermore, the advantages of the new work environment were stressed by another employee: *„You can work however you want in the COII which makes a difference for example for my creativity. I prefer to work from a corner of a sofa with a laptop on my knees. I can't do that in the case company or it wouldn't be accepted. We can also adapt our environment to our work which really helps.”*

As mentioned by Ambrecht et al. (2001) workplace design influences how people interact. Therefore, the location, size and type of the office facilitates knowledge flows within the COII. While the oldstream process is characterized by a closed office space, employees within the incubator are free to choose their working style. A place which supports freedom, flexibility, and social interactions with different people as well as provides networks will increase openness and the innovation process itself (Ambrecht et al. 2001).

In conclusion the analysis illuminates that the COII is not significantly increasing inside-out openness in contrast to the oldstream processes. This is especially related to a consistent IPR strategy of the company that is applied within the oldstream and newstream process. As a consequence, employees do not reveal more sensitive knowledge within the COII. However, the results of this study show that employees are more willing to share their challenges, ideas and feedback with other incubatees. Thus, the COII does not support companies to reveal more knowledge, but engages incubatees to exchange knowledge.

As the knowledge flows are facilitated by enablers and knowledge practices the ensuing paragraph elaborates on these and sums up the related findings of this study in a framework.

5.3. Enablers and knowledge practices

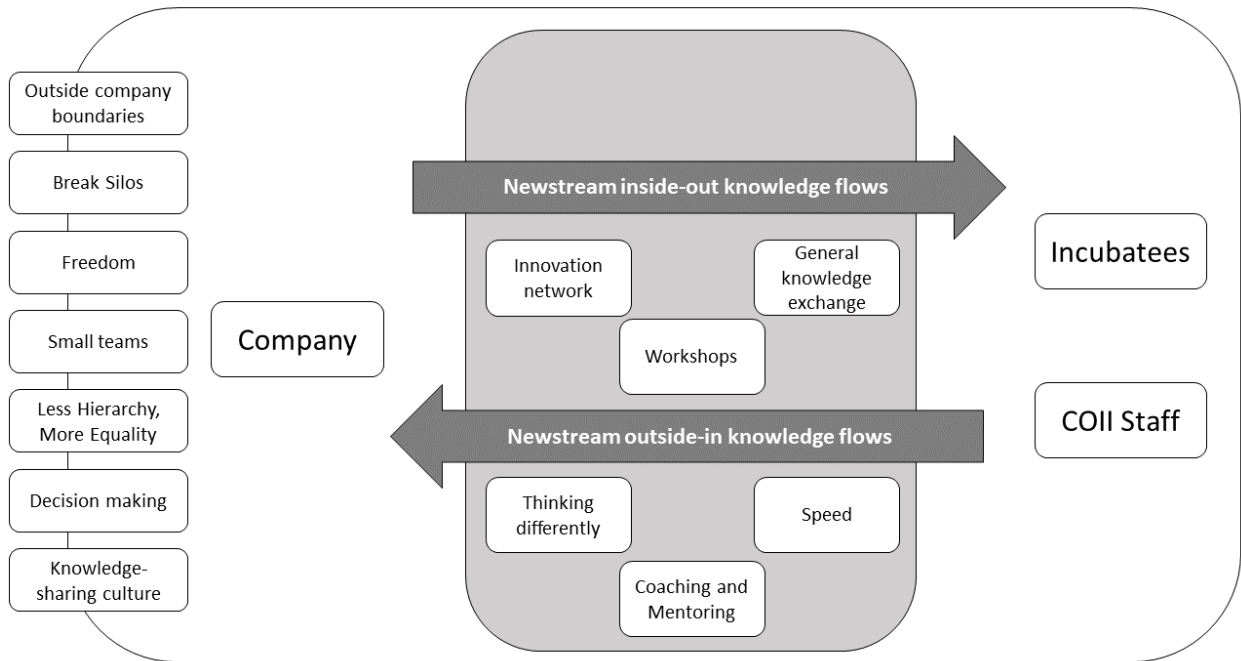


Figure 12. – Openness in the COII

Besides the higher degree of openness in outside-in and slightly in inside-out processes in the COII in line with Gassmann and Enkel (2004) the data describes the facilitating effect of enablers and knowledge practices on a company’s openness as established by the work of Ambrecht et al. (2001). Accordingly, these enablers and knowledge practices and the illustrating framework derived from the similarly named aggregated dimensions. In that relation it is important to stress that this study emphasizes the higher degree of openness and the facilitators in the form of enablers and knowledge practices in the newstream and therefore presents the uniqueness of the COII as a tool for open innovation.

The underlying framework illustrates inside-out and outside-in knowledge flows between companies and the COII mentors as well the other incubatees. Enablers in the COII embody the environmental circumstances to facilitate knowledge flows. The enablers show that being isolated from the core business, breaking silos through cross-functional teams, a small team,

equal and less hierarchical structures, faster and individual decision-making as well as a culture that engages to share knowledge facilitates a company's openness.

On the other hand, the knowledge practices deliver the tools to foster knowledge flows within companies. With regards to that it is remarkable that the practices coaching, thinking differently and working speed are initiated by the COII and accordingly facilitate outside-in knowledge flows. The knowledge practices collaboration workshops, networking and knowledge exchange embody outside-in as well as inside-out processes since they require knowledge sharing between company and incubatees.

However, the uniqueness of this framework should be elaborated. Knowledge flow frameworks highlighted within academic literature are distinguishable into two types. On the one hand research is focusing on knowledge flows inside an organization, on the other hand inter-firm flows are highlighted. In their framework Armbrecht et al. (2001) emphasized the structure of intra-firm flows, it's actors as well as enablers which are affecting the knowledge exchange. Alternatively, Easterby-Smith et al. (2008) created a framework where all influencing factors of knowledge flows are highlighted from donor firm determinants through knowledge and inter-organizational circumstances up to recipient firm elements. Nevertheless, the framework created within this thesis, is a special hybrid which is closer to the above mentioned inter-organizational theories since it investigates the effects of different practices and enablers on knowledge flows, between different actors in the COII.

Despite of the fact that the study Easterby-Smith et al. (2001) describes the growing distinction between inter-firm and intra firm knowledge flows, they clearly state the relationship among them. Thus, internal enablers and practices from Armbrecht et al. (2001) are also applicable for examining inter-firm knowledge flows within the COII.

A further uniqueness of the framework can be argued with the theory of external search breadth and depth by Laursen and Salter (2006), which is embodied by type of the collaboration within the COII. Besides the case company, two incubatee firms from different industries as well as the COII mentors are present. This indicates the number of knowledge sources and recipients as external breadth, along the differences between each actor as external depth (Laursen and Salter, 2006).

Overall, knowledge practices and enablers within the COII combined with a wide external search breadth and depth create an environment that fosters knowledge flows. This supporting function of the COII, is be further elaborated in the following conclusion, represents its uniqueness as a tool for open innovation.

Chapter 6. – Conclusion and implications

6.1. Conclusion

The aim of this study is to exhibit how the participation in a COII supports the opening up process and tantamount enhance a company's openness in open innovation collaboration. Subsequently, the knowledge flows that are exchanged in these collaborations determine the degree of openness.

Openness is of great importance for innovation-seeking corporations these days, especially from the viewpoint of gaining a competitive advantage through a rich body of knowledge that enables companies to innovate. Particularly, shortening product life cycles and limited resources for R&D make it more and more challenging for companies to innovate in-house. The openness of a company can overcome these obstacles and offers profitable opportunities by reducing research costs, spreading risks and bringing innovations to market more quickly.

Our findings elucidate how the COII can function as a tool to foster knowledge flows, in particular outside-in processes. Besides knowledge flows in relation to the development of new products the COII can be distinguished by knowledge flows about new and different approaches to tackle innovation as well as cultural change and a new mindset of the involved people. Accordingly, the analysis espouses the fact that companies can foster openness with higher outside-in knowledge flows through a participation in a COII. This finding is substantiated by different enablers and knowledge practices like special mentoring, trainings or networking with different companies that further boost knowledge flows within the COII. Following the uniqueness of the studied COII, which should be seen as a tool fostering openness, partly lies within the high engagement in collaboration with other incubatees.

On the other hand, the analysis did not significantly prove that the COII fosters inside-out openness of companies. Accordingly, the case company did not reveal more knowledge and in contrast even focused on the registration of more patents. However, companies share their challenges openly and feel less risk of revealing sensitive information within the COII. This can on the one hand be reasoned by the enablers and knowledge practices that encourage the incubatees to exchange knowledge. On the other hand, the COII encourages companies to engage in more outside-in as well as inside-out knowledge flows related to the external search breadth and depth, since knowledge is shared with two other companies from different value

chains as well as with the COII mentors. Thus, a higher degree of knowledge flows with diverse partners fostered by the above mentioned enablers and knowledge practices can support companies to open up.

Additionally, this study contributes to the existing knowledge body by studying a new form of corporate incubator and its effect on openness. With regards to that the COII is a new form of open innovation that facilitates the process of opening up companies.

6.2. Managerial implications

This research has studied a tool which can support the opening up process of an organization. Aggregate dimensions like knowledge flows, contextual data as well as certain practices and enablers were introduced and analyzed. These can be beneficial indices for managers considering to engage in open innovation and therefore to create a more open innovation process complementing internal R&D. Thus, using the above discussed findings managers can foster open innovation by increasing the access to various and diverse knowledge flows, which can stimulate innovations, hence creating competitive advantage through enriching the knowledge body.

Subsequently, a COII has to be seen as a tool which can play an essential part within the opening-up process. However, the utilization of this tool is not sufficient to open up companies. Several other factors like company culture, top-management commitment or absorptive capacity of the organization need to be fine-tuned in order to achieve a higher degree of openness.

Nevertheless, this study brings to light that the participation in a COII is a good first step for companies who decided to take actions of opening-up, especially for firms struggling to kickstart this process. The participation requires less resources than building own corporate incubators or initiate a complete cultural change with trainings and workshops particularly for a mid-tier or larger organization. Return on investment could also be realized sooner in time. Following the case company achieved to develop a product innovation within a few weeks, which can be seen as a massive acceleration compared to internal processes.

Contrasting the COII with oldstream collaborations reflects further managerial benefits. While, companies usually participate in co-developments or collaborations with stakeholders within their value-chain, the COII opens up the possibility to get in contact with different companies, namely with different sources of knowledge. Therefore the number of knowledge sources within

the COII can be distinguished to oldstream collaborations, which usually involved knowledge exchange between two companies.

Lastly, the data emphasize the importance of an environment that fosters knowledge exchange. That applies particularly to companies struggling to open-up for the sake of innovation. Forces against this openness within company boundaries could be especially difficult to overcome as stated during interviews. Thus, a neutral environment which is fostering openness characterized by a flat hierarchy, a location outside of the company as well as freedom for employees could affect generally skeptical employees to be more open with external sources.

6.3. Limitations

Since this research presents and builds on the findings of a single case-study, limitations connected to validity or generalizability could be highlighted (Bryman & Bell, 2011, p.61). Consequently, the thesis is measuring the phenomena through the eyes of this firm and therefore ignores the other participants of the incubator. Furthermore, findings, discussion and conclusion might be different within companies in other markets or countries.

Apart from different aspects, internal cultural challenges need to be emphasized. The COII involves three different companies with different cultures, internal processes, structure. Hence, their openness is affected by these internal factors which has an indirect effect on the COII collaboration.

Another important factor which has an effect on the overall findings is connected to the duration of the COII. Due to the fact that the company started in the incubator 7 months ago, findings are representing the effect of this period through the eyes of the case company. Although, the full process takes 12 months to complete and the company is eager to prolong the participation. Therefore, one could argue that the real effects of a opening up can only be visible by studying a longer time period in a longitudinal research.

Lastly, the case company initiated a new strategic direction with the aim of the so-called opening-up process recently. Thus it is difficult to precisely measure the proportionate effect of the COII within this strategic change.

6.4. Further research

In line with the limitations of this study further research is needed in terms of possible internal challenges for the participation in the COII, the sample size, characteristics of the participants as well as the contextual factors influencing the openness of a company.

Firstly, some interviewees stressed that internal challenges, for instance getting support for the COII project from internal departments, are difficult to handle and can hamper the success of the initiative. Following and with regards to the underlying framework of this study further research is needed in possible disablers and hampering knowledge practices that possibly diminish a company's openness in the COII.

Secondly, additional studies need to confirm the findings by scrutinizing the openness of other companies that participate in the COII. Accordingly, a sample with more incubatees could increase the validity and reliability of the findings.

Thirdly, this study emphasized how the COII supports companies to achieve a higher degree of openness, but did not bring to light whether the gained knowledge, enablers and knowledge practices are further executed within the company boundaries and therefore function as an impetus for cultural change. Therefore, further studies could emphasize the long-term effect of a COII participation on internal departments and therefore cultural change of companies.

Fourthly, the degree of openness can be influenced by the characteristics of the other incubatees. Accordingly, differences in culture or high bureaucracy could embody disablers of collaboration and therefore hinder knowledge flows between the companies.

Finally, the participation in the COII was determined in line with a strategic aim to open up the case company in general and therefore has to be seen as a part of this aim. Therefore, further research could study cases where this strategic aim is not formulated in order to present an more independent degree of openness in the COII.

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Appendix

Appendix 1. - Interview Guide

1. Facesheet infos

Age?

Position?

Years at current?

Where did you work before the case company?

Participation in the COII?

2. Oldstream knowledge flows

2.1. Openness - Oldstream

How you would describe R&D at the case company?

Is it more closed or open?

What role play patents for the case company?

How important are patents when you develop a new product?

How many collaborations with other companies or institutions did the case company do?

What kind of collaborations? Could you give an example?

How did you manage IPR in these collaboration?

Which kind of information do you reveal?

Who decided what kind of information you could reveal?

Are their any information you do not reveal?

How did the IPR policy affect the collaboration?

3. Newstream knowledge flows

3.1. Corporate Open Innovation Incubator

How would you describe the COII?

When did you start there?

What are advantages or disadvantages?

What are you doing there?

How does it differ from working at the case company?

What is the role of the employees from the COII you work with?

Why do you think the management decided to participate in the COII?

3.2. Openness newstream

How open are you within the COII?

How did you collaborate with the other participants?

Does the case company have similarities with the other participants?

What were the biggest advantages or disadvantages of these collaborations?

How does the knowledge revealing differ between the other companies? Where the other participants revealing the information in a different way?

Which kind of information do you reveal?

What is to process to decide what to reveal?

How does your IPR strategy look like in the COII?

Does the COII support or hinder you to share knowledge?

What do you think did you change during the COII?

What do you think did other people from the company change during the COII?

How much did you learn from the other companies and from the COII itself?

Could you feel differences or similarities compared to past collaborations with other companies at the case company?