How can High-Tech companies apply Student Surrogate Entrepreneurs on internal ideas

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Acknowledgments

This master thesis was written and executed in the spring semester of 2019, as the final part of the Master of Science in Industrial Engineering and Management at the Faculty of Engineering at Lund University. It comprises 30 out of the program's total of 300 credits. The authors would like to express their gratitude to those who have been part of, or supported, this study.

First of all, we would like to thank the case organization for giving us the opportunity to write our master's thesis in collaboration with the organization. Special gratitude to our supervisor Rodrigo Terra Rios who supported us in finding the research subject accessed important people to interview and kept us inspired and motivated over the entire project.

Secondly, we would like to thank all the inspiring people we got the chance to interview during the project. Thank you for taking the time to participate, and more importantly, participating with a great interest in our subject. We hope that all of you can benefit from our study, or at least feel that it has been meaningful.

Finally, we would like to express our gratitude to our advisors at the Faculty of Engineering, Lars Bengtsson and Emil Åkesson, for your support and valuable feedback. It has helped us constantly improve and challenge our way of thinking.

Lund, May 2019
Axel Truedsson and Sara Åkerblom

Abstract

High tech companies are constantly searching for ways to innovate their business, and open innovation has become a widely known concept and an important ingredient for companies in their way to becoming more innovative. Areas and clusters around the globe where the industry and University closely collaborating are organically increasing, and have proven to be a crucial mechanism in enabling innovation, spreading ideas and initiating more people to the start up arena. Large companies appear not possess the necessary skills for early stage innovation, whereas an external individual could serve as a catalyst and complement with the necessary skills, especially in terms of commercialization. Due to this, as well as indicators of students searching for entrepreneurial experience and an increased interest in entrepreneurship, there is great potential for companies to use students as entrepreneurs to commercialize internal ideas.

The purpose of this study is to investigate how high-tech companies can apply Student Surrogate Entrepreneurs on internal ideas, by investigating the important themes related to the phenomenon as well as different models used to apply Student Surrogate Entrepreneurs.

In total, 22 interviews were conducted with students, idea inventors, representatives from universities, companies and incubators, from existing solutions of applying Student Surrogate Entrepreneurs and a case organization and its local ecosystem. The interviews were performed in order to identify key stakeholders, possibilities and blockers around important themes related to applying Student Surrogate Entrepreneurs and what different models there are to apply Student Surrogate Entrepreneurs on company ideas. The following five themes are identified in this study: (1) motives, (2) resources and costs, (3) ownership model and contracting, (4) matching the student profile with idea, (5) the characteristics of the idea. From the identified themes the authors suggest key success factors for applying Student Surrogate Entrepreneurs on internal company ideas. Further, the study identified the following models; (1) the university-platform model, (2) the intermediary-platform model and (3) the internal-platform model. Finally, the study contributes with a recommendation to a case organization.

Keywords: Surrogate Entrepreneurship, University-Industry Collaboration, Open Innovation, Corporate Entrepreneurship, Venture Creation Education

Sammanfattning

Högteknologiska företag söker ständigt efter sätt att innovera sin verksamhet, och öppen innovation har blivit ett allmänt känt koncept och en viktig faktor för företag för att bli mer innovativa. Områden och kluster runt om i världen där industri och universitetet har ett nära samarbete ökar och har visat sig vara en viktig mekanism för att möjliggöra innovation, sprida idéer och involvera fler i start up-världen. Dessutom, har företag inte de kompetenser och den kunskap som krävs för att arbeta med innovation i ett tidigt stadie, medan en extern individ kan fungera som katalysator och komplettera med den kompetens som krävs, särskilt vid kommersialisering. Med orsak till detta, samt indikatorer att studenter är intresserade av och eftersträvar entreprenöriell erfarenhet, finns stor potential för företag att använda studenter som entreprenörer för att kommersialisera interna idéer.

Syftet med denna studie är att undersöka hur högteknologiska företag kan applicera så kallade Student Surrogate Entrepreneurs på interna idéer, genom att undersöka teman relaterade till fenomenet samt vilka modeller som kan tillämpas.

Totalt genomfördes 22 intervjuer med studenter, idé-uppfinnare, representanter för universitet, företag och inkubatorer, från befintliga lösningar att tillämpa Student Surrogate Entrepreneurs, samt från en case organisation och dess lokala ekosystem. Intervjuerna utfördes med syfte att identifiera viktiga intressenter, möjligheter och barriärer kring teman relaterade till att tillämpa Student Surrogate Entrepreneurs och vilka olika modeller som fins för att applicera surrogatentreprenörer på företagsidéer. Denna studie identifierar följande fem teman: (1) motiv, (2) resurser och kostnader, (3) ägandemodell och kontrakt, (4) matchning av studentprofil med idé, (5) idéens egenskaper. Från identifierade teman sammanställer författarna viktiga framgångsfaktorer för att tillämpa Student Surrogate Entrepreneurs på interna företagsidéer. Dessutom identifierar studien följande modeller; (1) universitetsplattforms-modellen, (2) tredjepartsplattforms-modellen och (3) interna plattforms-modellen.

Nyckelord: Studentsurrogat-entreprenörskap, Universitet- och industrisamarbete, Öppen innovation, entrepreneörskap i företag, entreprenörskapsutbildning

Contents

Chapter 1

Introduction

This chapter aims to put the reader and the master thesis in a context, by providing and concretize a background of the research field, issue of study, purpose of study and a research question. Furthermore, the delimitations are declared to expose the extent of the study. Lastly, the chapter presents a summary outline of each chapter in the thesis.

1.1 Background to Research Field

With the increasing globalization of industries, markets and expanding competition, the traditional role of internal research & development, R&D, as the major source of innovation within technology-driven companies is questioned. The new business landscape has resulted in a higher demand for an more open innovation process. It is no longer considered sufficient with only internal development. H. W. Chesbrough (2003) defines this as the open innovation paradigm. In the new innovation paradigm, an increased share of companies' R&D budget is spent on outside sources of innovation, such as suppliers, customers, research institutes, and universities (Becker & Gassmann, 2006).

For long, it has been almost universally accepted how innovation through technological change drives growth, productivity and material welfare. During the 1990s, researchers provided the industry with several studies on how to maximize the potential value from innovation. Innovation processes are complex, concerning both translation and diffusion

of knowledge, while they seldom follow a linear process. Innovation processes occur over periods of time and are affected by several different key stakeholders, and therefore it is usually considered a set back to regard the innovation process as exclusively an internal process (Edquist, 1997).

The generic economic and social benefits of universities, such as educating cohorts of graduates, generating scientific knowledge and creating functional infrastructures, have long been recognized as an important source of industrial innovation. Traditionally, university-industry links have been focused on the transfer of intellectual property, IP. However, recent observers have pointed to a more multi-faceted nature of university-industry links. The new nature of the links has its focus on functions as informational or social pathways through which information, knowledge and other resources are exchanged or co-produced across universities and industry (Fromhold-Eisebith & Schartinger, 2002).

There are multiple examples in the market of high-tech companies, further referred to as HTCs, actively working in close collaboration with universities to promote innovation and technology transfer. Highly technological companies such as IBM, General Electric and Siemens, have been involved in several collaborations with universities over the last decades. Younger and more unconventional global, yet technological, corporations such as Google, Amazon and Facebook are outspokenly adopting universities as a key element to their early-stage innovation processes. Further, areas and clusters around the globe where the industry and university are closely collaborating are organically growing. Both academia and companies have a lot to gain from a successful partnership and collaboration, as proves in areas such as Silicon Valley in California, Kendall Square in Cambridge and Block 71 in Singapore. In these areas, the collaboration and interaction within the ecosystem of universities and industry, as well as government entities, venture investors and other entrepreneurs, have proven to be a crucial mechanism in enabling innovation, spreading ideas and initiating more people to the start up arena (Frølund, Murray, & Riedel, 2018).

1.2 Background to Thesis

This study is initiated through a collaboration between the Lund University Division of Innovation Engineering and a particular HTC in Sweden, further referred to as the case organization (an introduction of the organization can be found Appendix A). The case organization have in recent years actively expanded and reorganized their R&D and innovation

activities. This has partly resulted in a system for employees to display their own innovative ideas. However, the organization has detected a great number of the internal ideas miss a driver, i.e. the idea inventor is not willing to take the idea further. At the beginning of 2019, the case organization had almost 200 ideas submitted (not including patents) in their system for submitting internal ideas, whereof more than half of the ideas were missing a driver. Hence, the potential of ideas originated within the organization could be argued not to be fully explored.

Simultaneously, the case organization is looking for new innovative models through which they can collaborate with universities and students. From internal investigations at the case organization, eight potential touch points between the case organization and nearby regional universities and students have been identified. One of the identified touch points is students exploring the case organization's ideas, a concept which later will be established as Student Surrogate Entrepreneurship.

In addition to this, there are several indicators showing how students on a regional level are looking both for more practical and entrepreneurial experiences. Lund University's yearly student environment report showed in 2018 as much as 38% of all the students at Lund University expressed a desire for more practical exercises in their education (Holmström, 2017). Further, a study performed by Drivhuset in 2013, concluded almost 70% of the asked students among universities in Sweden, were willing to start their own start up at some point and nearly 50% believe they will start their own company within ten years. Thus, there seems to be a great interest in entrepreneurship among Swedish students, nevertheless, only 7% of the participapting students were at the moment actually driving their own business. An indicator of how even with an identified ambition to become entrepreneurs among students, very few students actually realize their ambitions (Shams & Westerback, 2013).

1.3 Issue of Study

For HTCs, the ability to create new, innovative and value-adding activities is of evident importance. In a business environment where competition is getting more intense, it is also increasingly important for HTCs to actively pursue fresh grounds and look for new ways to differentiate themselves in the market (H. Chesbrough & Weiblen, 2015; Kohler, 2016).

Radosevich (1995) described how large technological firms, in regards of commercialization of

new technology, posses advantages such as adequate technological expertise, existing market power, existing key linkages to customers, distributors and potential strategic partnerships as well as potential synergies with current technologies. However, large technological firms fall short in terms of ability to move rapidly, due to high bureaucracy and not having the necessary managerial skills for early-stage innovation. Whereas, an external individual could serve as a catalyst and complement with the necessary skills, especially in terms of commercialization (Radosevich, 1995).

In addition to this, HTCs often try to intensify their collaboration with universities and students. This has historically and empirically proven to be a successful strategy to reduce costs in early-stage research and innovation, as well as leveraging competence at companies by open up new avenues of engagement with a broader innovation ecosystem (Lutchen, 2018; Frølund et al., 2018).

The thesis originates from the case organization desire to investigate the assumed opportunity of applying Student Surrogate Entrepreneurs, further referred to as SSEs, on internal ideas. By addressing the increased interest in entrepreneurship among students, the phenomenon of applying SSEs could be a way to explore the potential value of internal ideas, as well as a new model for engaging with students. In order to fulfill this, the case organization needs to obtain an understanding of the different motives from stakeholders related to SSEs and what opportunities and challenges may arise when implementing this through different models.

1.4 Purpose

The purpose of this master thesis is to answer the presented research question, and based on the answer provide a recommendation to the case organization on how to apply SSEs on internal ideas. Further, the study aims to contribute to the literature of open innovation, and more specifically to increase the knowledge around Student Surrogate Entrepreneurship, not to be confused with SSE, which refers to Student Surrogate Entrepreneurs, as the initial literature review implies a lack of literature presenting different models on how to implement SSEs. Finally, the current literature on SSEs seems to have a focus on the academic perspective rather than the industry perspective. Hence, it opens an opportunity for the study to provide another perspective of the concept in the literature of SSEs.

1.4.1 Research question

The research question for this master thesis is as follows:

How can high-tech companies apply Student Surrogate Entrepreneurs on internal ideas?

The research question will be answered by answering the following sub-questions:

(1) Which are the key stakeholders and what are their motives?

(2) What are the key success factors in order to succeed with student surrogate entrepreneurship?

(3) What different models can be utilized and what are their advantages and disadvantages?

1.5 Delimitations

The focus of the study is on large established companies and students at master's level. Other than this, as the study have an exploratory approach, there have been no other major delimitations.

1.6 Disposition

Chapter 1: Introduction
In the first chapter, the reader is introduced to the background of the research field and thesis, as well as the issue of the study. The research question is also presented, followed by the delimitations of this study.

Chapter 2: Method
Chapter two describes and motivates the method used to answer the research question and the recommendation for the case organization. It presents the methods for data collection and how the analysis of the findings are structured. Further, the process to conduct the different tasks within the study is illustrated and described. Finally, the credibility (i.e. the validity, reliability and transferability) of the study is discussed.

Chapter 3: Theoretical Background
The third chapter aims to give the reader an extensive theoretical background to the research subject, which lies the foundation for the theoretical perspective. The theoretical framework is mainly based upon current literature and research on open innovation, university-industry collaboration, corporate entrepreneurship and surrogate entrepreneurship.

Chapter 4: Empirical Findings
This chapter presents the empirical findings, based on the collected data from the in-depth semi-structured interviews as well as a shorter quantitative questionnaire. The findings are based on themes related to applying SSEs on company ideas, identified through the theoretical review as well as through the empirical study, i.e. the themes the interviewees addressed as important. The interviewees are categorized as those with experience of existing solutions of applying SSEs and those within the case organization and its local ecosystem. Further, interviewees are separated on the following stakeholders: university, student, idea provider, idea inventor and incubator.

Chapter 5: Analysis and Discussion
Chapter five aims to discuss and analyze the identified themes related to applying SSEs on company ideas, in regards to the stakeholders perspectives. Further, potential models for applying SSEs are discussed and analyzed in regards to the themes and to different stakeholder's perspectives.

Chapter 6: Conclusion and Final remarks
The last chapter declares the conclusions of the study and answers the research question, including a recommendation for the case organization on how to apply SSEs on internal ideas. Thus, the chapter presents contributions to the case organization on how to open up externally within their innovation work as well as to the research field of open innovation. Lastly, suggestions for further research and limitations are presented.

Chapter 2

Methodology

This chapter describes and motivates the method utilized to answer the research question. It presents the method for data collection and to analyze the findings. Further, the process to conduct the different tasks within the study is illustrated and described. Finally, the credibility, including validity, reliability and transferability, of the study is discussed.

2.1 Work Process

The work process for the study was in line with the framework for conducting qualitative research, described by Hennink, Hutter, and Bailey (2011). Thus, the process followed the iterative nature of qualitative research. The process is described in Figure 2.1.

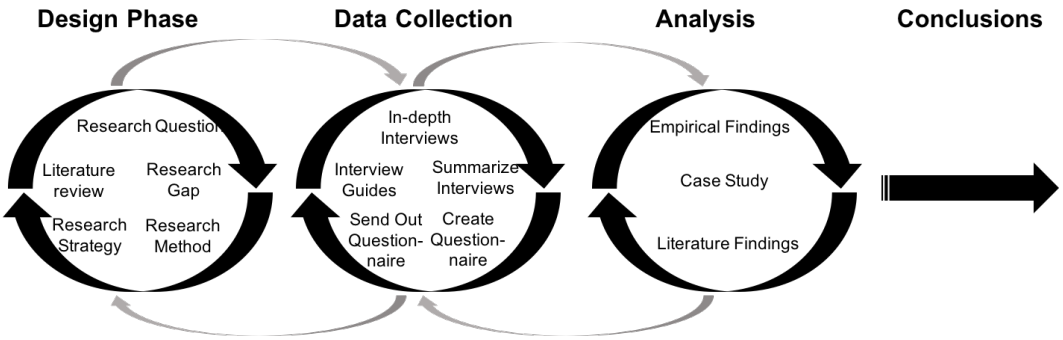

Figure 2.1: Work Process (Created by the authors)

The first phase, the design phase, aimed to define a research question and a method for conducting the study, in parallel with a literature review of the subject. Another objective for this phase was to find a research gap, in order to be able to contribute within the research field.

The data collection began once the research question was settled, along with a method and strategy for the study. However, the design was iterated along with the data collection, as the authors discovered other literature, and redefined the research question and method in order to match the available empirical data. In this phase, interview guides for the different categories of interviewees were created, followed by recruiting participants, conduct the interviews and summarize them. Also, a questionnaire was created and sent out.

The analysis phase was initiated when the data had been collected. Still, some data collection maintained in parallel to the analyzing, due to the authors aimed to begin the analysis once the data for each part was collected (see 2.3 Data Analysis). Further, the authors found some gaps in the collection of data once the analysis was initiated and complemented the data with recruiting new participants for interviews or performed complementary interviews with previous interviewees.

Moreover, the work process of the data collection and analysis phase was divided into two steps: (1) data collection and analysis of existing cases of applying SSEs, and (2) data collection and analysis of the case study (see Figure 2.2.).

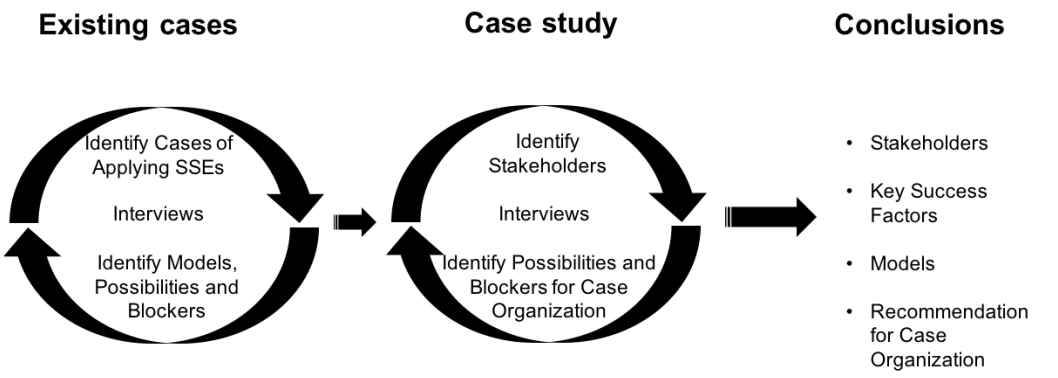

Figure 2.2: The work process of the data collection and analysis phase (Created by the authors)

Firstly, the authors investigated the phenomenon of Student Surrogate Entrepreneurship and identified several existing cases of applying SSEs. The first identified case of applying SSEs (which was through a master program at Chalmers University) was discovered through the literature review. The other existing cases were identified through a list of universities applying venture creation programs (see Appendix C), as well as through recommendations from interviewees. Hence, the five different cases of existing solutions which is the study's foundation to understand and explore in what ways SSEs could be applied with different stakeholders as well as possibilities and blockers with different models, were identified through a snowball method. However, the authors believe there are more existing cases of the phenomenon, even though they were not found in this study.

Secondly, once the existing cases had been studied and analysed, the authors continued with a case study with the aim to create a recommendation for the case organization (non-experienced of SSEs) on how to apply SSEs on internal ideas. In the case study, the authors identified stakeholders within the case organization and its local ecosystem and interviewed representatives from different stakeholders in order to understand specific possibilities and blockers for the case organization when applying SSEs on internal ideas.

2.2 Research Strategy

Whilst the area of open innovation is considered to be quite widely explored and described, the specific area within open innovation through SSEs has not been as well-documented. Therefore, it is reasoned to use appropriate research methods to explore, explain and enlighten the subject of SSE. Thus, this study takes a qualitative exploratory research approach. Furthermore, a case study design has been chosen for the study (see 2.2.3 Case study design).

This study contains two components of data collection. Firstly, a literature review of the current research of open innovation, university-industry collaboration, corporate entrepreneurship and surrogate entrepreneurship is conducted. The literature review lays the foundation of the theoretical background which upon the research rests. The literature study aims to create a theoretical background regarding potential stakeholders, potential themes and a holistic overview of the existing literature regarding the research area.

Secondly, an empirical study was conducted with people from different stakeholders with experience of SSEs, as well as potential stakeholders for applying SSEs in the case organization's local ecosystem. The empirical data was mainly collected through qualitative interviews and aims to give a practical and realistic perspective of key actor's perspective on the subject of study. However, a part of the empirical study (of the case organizations ecosystem) was of quantitative approach.

The ambition of the method was to perform most of the data collection in chronological order, in order for the empirical findings to benefit as much as possible from the previous literature review. However, some parallel progress of the data collection was conducted (see 2.1 Work Process).

2.2.1 Exploratory research approach

The study is of exploratory character, due to its aim to explore and discover an unknown phenomenon; to deeply understand it, and to contribute with new insights to the related research field (Höst, Regnell, & Runesson, 2006). An exploratory approach aims to create a deep understanding of how a specific action, feature or situation is functioning. It should answer questions such as *when*, *where*, *how* and *in what context*, in order to present new insights and knowledge to the reader (Wallén, 1996).

As stated in the research question, and the purpose of this thesis, the main intent of this research is to investigate the perspective of how HTCs can apply SSE on internal company ideas, a subject which has had a scarcity of previous research performed. Thus, an exploratory research method is considered appropriate. Because of the exploratory approach, the authors choosed to have a broad approach. This resulted in interviews with several different stakeholders, rather than several interviews with one stakeholder. Further, in order to create a fully comprehensive and nuanced understanding, stakeholders considered to have important insights were asked about their perception of other stakeholders. cc

2.2.2 Qualitative research approach

When studying unknown and uncharted issues it is preferred to use a qualitative method, rather than a quantitative (Bryman & Bell, 2003). Since qualitative data consists mostly of words and descriptions, in opposite to quantitative data, the qualitative data contains room for interpretation and nuances. Consequently, when using a qualitative research method, it is essential to be consistent, avoid bias and be structured in the handling of data (Höst et al., 2006).

Further, the design of the research approach is flexible, rather than fixed, since the study aims to explore and deeply understand a phenomenon. Hence, the design develops and adapts as the study proceeds, as well as the focus of the study can change during the process (Höst et al., 2006; Robson, 2002).

2.2.3 Case study design

Since the study aims to research an existing phenomenon within its context, a case study designed was chosen (Robson, 2002; Yin, 2003). Further, case studies are appropriate for studies with an exploratory research approach (Höst et al., 2006). The context of the study is an HTC's approach on how to apply SSEs on internal ideas. Hence, the case study is based on a single case and it is considered an exploratory single-case study (Yin, 2003).

Interviews are a common method for data collection in case studies, as well as qualitative methods, because it allows a detailed investigation of a particular case (Bryman & Bell, 2003). The conclusions of a case study are not directly generalizable, however, a case with similar conditions has a higher likelihood of similar conclusions (Höst et al., 2006).

2.3 Data Collection

The data collection for the research consists, as previously mentioned, of a literature review and an empirical study. To answer the research question, data has mainly been gathered through the empirical study, however, initially the authors reviewed the literature around the phenomenon in order to create a foundation for the empirical study.

2.3.1 Literature study

The literature review has been conducted by using well-known and established databases, and the four main sources for theoretical data were; (1) *LUBsearch* - Lund University's common search engine for research articles, disputations, journals etc., (2) *Google Scholar* - a global search engine for researchers within interdisciplinary areas, (3) *Researchgate* - a global search engine for researchers within interdisciplinary areas, (4) *others* - including recommended articles personally from the interviewees within the empirical study.

In order to keep the search and data collection structured and consistent, the criteria to be related to the subject of open innovation, corporate entrepreneurship, university-industry collaboration or surrogate entrepreneurship, was set. Furthermore, peer-reviewed articles were primarily collected and chosen over literature without any peer-reviews.

The authors used the following keywords to find articles and other literature sources: *"surrogate entrepreneurship", "university-industry collaboration/partnerships", "open innovation", "corporate entrepreneurship", "venture creation education".*

2.3.2 Semi-structured in-depth interviews

The empirical data of the study consists mainly of in-depth interviews. The structure was chosen because it enables an investigation of the phenomenon from the perspective of the interviewee by gathering insights of personal experiences (Hennink et al., 2011). Further, the way an interview is structured and conducted highly affects the outcome and trustworthiness of the collected data. Robson (2002) suggests there are three different categories of interview formats; (1) fully-structured, (2) semi-structured, and (3) unstructured, whereof the semi-structured approach was applied in this study. The semi-structured interview format enabled

the authors to vary the order of the predetermined questions and wording depending on how the interview proceeded. Also, questions can be disregarded or added if necessary. This allowed the authors to prepare a framework of questions and an interview guide, and still proposed flexibility if needed. (Bryman & Bell, 2003)(Robson, 2002). The interview guides can be found in Appendix D.

Since the aim of a semi-structured interview should be to allow the interviewee to speak as freely as possible, the interviewers were careful not to affect the interviewee with potential biases or guiding when navigating the questions (Robson, 2002). Further, the interview guides had the suggested format of Fitzpatrik (2014). Those are, to define expected learning and outcome beforehand, frame broad questions and not give away the obvious intentions and ask for specific and concrete facts (Fitzpatrik, 2014).

The authors interviewed at least one representative from each group of stakeholders and aimed to gather a few and more strategic sampled interviews rather than to increase the number of interviews, in order to gain a holistic understanding of the phenomenon. Furthermore, the number of interviews has been affected by limitations in resources and time, and also due to a limited number of people with experience of SSEs.

2.3.2.1 In-depth interviews with stakeholders from existing solutions of applying SSEs

To understand the challenges and opportunities of existing models of applying SSEs, interviews were held with representatives from different stakeholders from existing solutions of applying SSEs; universities, students, idea providers, individual idea inventors and incubators. The only selection criteria was previous involvement in assigning SSEs.

2.3.2.2 In-depth interviews with the case organization and its local ecosystem

Further, representatives of external stakeholders within the case organization's local ecosystem were interviewed. The objective was to gain a specific understanding of how the case organization can implement SSEs by understanding possibilities and challenges within the local ecosystem. The selection criteria for the interviewees in the local ecosystem were to be established in *"greater Copenhagen area"*.

The interviewees within the case organization were partly selected with support from the supervisor within the case organization, aiming to capture the relevant parts of the organization influenced of a potential implementation of SSEs or with specific insights.

2.3.3 Questionnaire

The empirical study includes a quantitative questionnaire (with 60 answers and sent out to 300 people), it aims to provide a holistic view of the student perspective of the case organization's local ecosystem. The authors assumed qualitative interviews with only a few students who do not have former experience of SSEs, not to be representative of the stakeholder's perspective. Students are different compared to an organization such as a university, company or an incubator with management able to speak for the purpose of the organization. For details of the quantitative questionnaire, see Appendix B.

2.4 Data Analysis

According to Robson (2002), a common phenomenon when analyzing qualitative data, is the difficulty to maintain a clear mind and avoid biases. The authors took this into consideration during the analysis of the study, by keeping the following human imperfections in mind:

- *Ignorance of conflicting hypothesis.* The authors strived to keep an open mindset to conflicting hypotheses when conducting the collected data.
- *Ignorance of uneven reliability.* When conducting qualitative research, one common human impact is the ignorance of the fact how some references are more reliable than others. The authors adjusted to this by prioritizing peer-reviewed articles when selecting data for the theoretical background, as mentioned in 2.3. Data collection (Robson, 2002).

Firstly, the identified themes related to applying SSEs were analyzed and discussed in regard to the empirical data from empirical findings on existing solutions of applying SSEs. The data from each identified stakeholder was analyzed separately in order to understand where different groups are aligned or have contradictions and in this way, discover challenges and opportunities. The identified empirical cases of different structures for applying SSEs were also the foundation for discussing potential models for applying SSEs on company ideas.

Further, the themes were analyzed related to the different models, by discussing what advantages and disadvantages were related to the different models and how they relate to the stakeholders' perspectives on the themes.

Secondly, the case organization and its local ecosystem were analyzed and discussed in regard to the identified themes related to applying SSEs and the different models. Thus, specific possibilities and blockers for the case organization were identified.

Finally, the intersection between the different sources of information constituted sweet spots for the case organization within the different themes. Hence, a final recommendation for the case organization on how to apply SSE on internal ideas could be concluded by combining the analysis of existing solutions of applying SSEs with the analysis of the case organization and its local ecosystem.

2.5 Credibility of Study

The credibility is considered to be high through a proper collection and interpretation of data, resulting in findings and conclusions which reflect and represent the world as it was studied. Yin (2003) suggests three ways to increase the credibility of a study, which is to consider validity, reliability and transferability (Yin, 2003).

2.5.1 Validity

The validity considers the correctness of a result, meaning how the study measure what is actually supposed to be measured (Bryman & Bell, 2003). The inaccuracy and incompleteness of data are the main factors which decrease the level of validity. To avoid this, the authors have sent back summaries of the interviews to the interviewees, in order to ensure correct interpretations of their perspectives. The takeaways from the interviews were updated with changes if an interviewee had some objection. Bryman and Bell (2003) also mention the insufficient amount of data as another threat to the validity, because it may enhance the risk of invalid conclusions. This factor has been more difficult for the authors to impact, due to the limits in time and resources. Another limitation, in order to collect a greater amount of data, is due the phenomenon of SSEs is not very widespread and previously known.

Further, the validity of a study can be reinforced through triangulation, which is done when several references indicate the same thing. Hence, a way to assure validity is by the sign of alignment between different references (Starrin & Svensson, 1994; Yin, 2003). To adopt triangulation and avoid biases, both of the authors attended all interviews and verified the summaries afterward.

2.5.2 Reliability

Reliability measures the extent to which an instrument, method or approach delivers the same result at different points in time, within the same circumstances (Bryman & Bell, 2003). Thus, the reliability of a study depends on the precision of the chosen methods. The authors identified several articles published in different years which indicated the same conclusions, which increases the reliability in the literature review. However, the authors identified a weakness concerning reliability. The choice of keywords and peer-reviewed articles were primarily derived from references by other articles or interviewees, which can be argued to decrease the level of reliability of the theoretical background.

Regarding the in-depth interviews, the semi-structured approach made the interviews differ from one another. Hence, the reliability in the empirical data collection was lower than it would have been with structured interviews. Further, in some of the interviews, the perspective on a particular matter mentioned by another interviewee may have been missed due to the question was never asked. The authors therefore sometimes got the perspective on a specific matter from some of the interviewees and some were left without the authors knowledge of their perspective on the specific matter. The limitations in time and resources resulted in the researches could not complement all interviews with some missed questions and get their perspective, even though it was done a few times. However, the predefined main learnings and objectives for the interviews, as well as the interview guides, ensured the most important questions and themes were included.

2.5.3 Transferability

Transferability refers to if specific findings from a qualitative study can be transferred to other situations (Yin, 2003). In this study, the case study with only a single case organization, affects the generalizability of the conclusions. When the focus of a study is on one single case the learnings of the study are considered to be context dependent (Marshall &

Rossman, 1999). However, even though the conclusions cannot be generalized, lessons can be learned and it can be argued a case with similar conditions has a higher likelihood of similar conclusions (Höst et al., 2006).

Chapter 3

Theoretical Background

The theoretical background aims to provide the reader with the required theoretical foundation, by reviewing literature and research related to the issue of study. The theoretical background contributes with a brief background to the fields of innovation and entrepreneurship, with a certain focus on the areas of open innovation, university-industry collaborating and entrepreneurship within corporations and universities. Lastly, a thorough review of available literature regarding the concept of Surrogate Entrepreneurship and specifically SSEs is presented.

3.1 Open Innovation

H. W. Chesbrough (2003) proposed in the early 2000s how large technological powerhouses had gained their leading positions because of their internal research and development departments. By working internally and pushing the technology forward, these high-tech firms did not just keep the knowledge internally, but also provided a great barrier of entry for new players. However, by the end of 2000, many high-tech firms got overtaken by companies with a different strategy. The global technology company of IBM, at the time well-known for investing large amounts in internal research and development activities, faced strong competition of companies such as Microsoft and Intel, which applied a far more open research strategy. Similarly, in the telecommunication industry, large established actors such as Siemens and Motorola watched as Nokia took the leading role within wireless telephony

in just 20 years. According to Chesbrough (2003), the difference between the companies could be explained by the companies different innovation processes. Whilst IBM, Siemens and Motorola used a closed innovation model, Microsoft, Intel and Nokia utilized an open innovation model (H. W. Chesbrough, 2003).

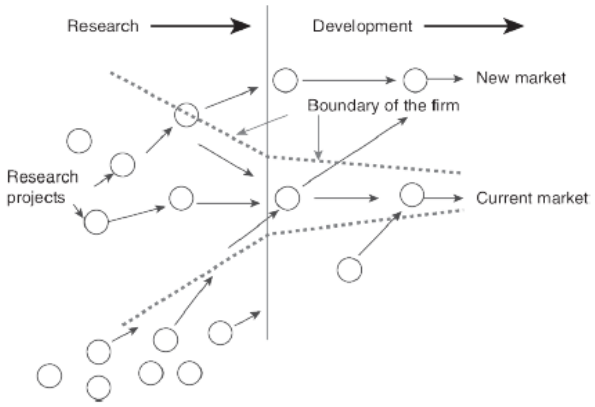

Figure 3.1: Open innovation (Source:(H. W. Chesbrough, 2003)).

The concept of open innovation implies profitable ideas can origin both internally and externally of the firm's boundaries. Ideas can reach the market both from the inside and the outside of the company. In order to successfully serve the market and keep its competitive edge, a company should not exclusively rely on its internal ability to innovate. Nor should it fully rely on external assets. As described by H. W. Chesbrough (2003), *"Open Innovation means that valuable ideas can come from inside or outside the company and can go to market from inside or outside the company as well".* By exploiting findings and leveraging discoveries from external players in the firm's network, it is possible to create new ways of benefiting from internal, as well as external, assets.

Since open innovation is especially relevant for the company perspective of research and development, it has received a great amount of awareness and recognition, as well as the limitations of closed innovation have been exposed by many firms. Especially within the technology industry, because of its very distinct influences of network presence, open innovation is considered decisive. As concluded by Saint-Paul, *"Once the notion of inter-organizational innovation collaboration has entered an industry, everyone who does not participate will cope with serious competitive disadvantages"* (Saint-Paul, 2003). The significance of open innovation is today widely discussed over several cross-disciplinary areas, such as strategic,

organizational, behavioral, knowledge, legal and business perspectives, and its economic implications (Enkel, Gassmann, & Chesbrough, 2009; Haley, Bielli, & Mocker, 2015). Recent scholarly articles indicate the circumstances of today's business climate are increasingly exhibiting situations where open innovation is highly applicable (Enkel et al., 2009). Further, additional research has shown evidence of implementing a clear strategy towards openness in the research and development policy, results in higher project efficiency, better technical performance and higher financial revenues (Enkel et al., 2009; Jingshu Du, 2014).

Paths and processes over the company boundary in the open innovation model includes licensing of IP. By licensing out, as well as licensing in, ideas, IP and patent companies as Microsoft could reap the full potential and benefit of a fast-paced and highly technological market. By receiving payments and paying for ideas the companies with an open innovation model could explore, and have their own ideas explored, in a much higher rate than those companies who exclusively used a closed innovation model (H. W. Chesbrough, 2003).

Some highlighted difficulties of open innovation consist of the sometimes troublesome process of finding appropriate partners. In order to successfully obtain the suggested advantages, the firm has to find a balance between activities and resources allocated concerning open innovation and daily business, as well as the allocation of time and financial resources. Enkel et al (2009) also point out the possible negative long-term effects if the company is too open. In this case, the company run risk of losing control of processes and dispersion of core competence (Enkel et al., 2009).

3.1.1 Inside-out innovation

For this research, it is considered to be of importance to explore the characteristics of moving an idea or knowledge from the internal scope to external scope, since this is what a SSE would do. In the case of an idea crossing the firm's boundary from internally to externally, it often turns out to be one of the following activities: R&D service, license out, spin-off or Divest (H. W. Chesbrough, 2003).

The inside-out perspective on innovation often, no matter in which stage, requires the organization to allow external actors to pick up unutilized ideas and assets. This can be done either by selling or simply revealing the asset to the actors outside the organization (Arora, Fosfuri, & Gambardella, 2001; Maarse & Bogers, 2012). Managing inside-out innovation can be challenging, as organizations have to realize they can no longer be in full control

over the process. However, the inside-out perspective is assumed to make the organization's innovation process part of a larger ecosystem.

The rationale for conducting inside-out innovation in a large corporation is multifaceted. Not only will the organization have the obvious increased possibility of gaining new revenues, compared to keeping ideas and IP unutilized, inside-out innovation can also create a more fulfilling environment for employees, as new knowledge could be transferred. The other pathways, incorporated through inside out innovation, allow the market to provide feedback, and can also allow the researchers to receive crucial feedback in an early stage to widen their perspective. Even if the project never reaches the organization's portfolio, it would provide important insights and increased knowledge of the market. Crossing the firm's boundary, from an internal to an external scope, should not be considered a way to dispose of unwanted assets, but rather a preferred way of creating future businesses (H. W. Chesbrough, 2003).

3.2 Corporate Innovation

Organizations with a successfully innovation process often create a unique competitive advantage, creating a crucial competitive edge in the market (Tidd & Bessant, 2014). Some literature even places the importance of the firm's capability to innovate as the uttermost important determinant of a firm's result (Mone, McKinley, & Barker, 1998). If an organization fails to prove themselves as innovators and provide the market with inventions, they will most likely be challenged and pushed away from the market, resulting in their non-existence (Tidd & Bessant, 2014; H. W. Chesbrough, 2003).

As outlined by Fagerberg and Mowery (2006), there are two important factors, which should be considered regarding innovation in organizations. Those are; openness to new ideas and solutions and the systematic nature of innovation. The importance of openness follows logically of the nature of innovation, as innovations essentially consist of new combinations of existing solutions, products, resources, etc. Thus, a greater variety and differentiation in the input of these, the greater are the possibilities of creating new combinations. Further, another aspect of corporate innovation is highlighted in the current literature, is the systematic nature of innovation, implying the success of innovation is heavily dependent on external actors (Fagerberg & Mowery, 2006).

The ability to innovate is of particular importance for technological companies since they

are acting in an environment which is changing rapidly. Not only are technology companies required to innovate in order to be cost competitive, but their product portfolio needs to be constantly reinvented to keep up with customers changing preferences. Friedl and Kayser (2017) further suggest the allocation of resources related to innovation activities are especially important for technology companies since innovation in their case usually requires high investments.

Despite a seemingly surplus of financial resources and competence, innovation inside large companies is still often considered difficult to arrange. In most established organizations it even appears as innovation only occurs through unplanned situations and exceptions, rather than active contributions aiming to create innovation. It even appears as policies and procedures with the purpose of turning the company into a more competitive entity actually hinders the innovation capability (Blank, 2014). This inability is a result of several factors. According to Berchicci, King, and Tucci (2008) organizational rigidity and cognitive barriers are two major blockers for companies' ability to innovate. Leonard-Bart (1995) also suggests organizational capabilities, required and well suited for known challenges for the firm, often turns into organizational rigidity when faced with new and unknown challenges.

3.3 University-Industry Collaboration on Innovation

Universities are often a key stakeholder within the innovation system and can be a strategic actor in each phase of the innovation process: from idea generation to product launch when considering new product and service development, and from seed to sustained growth in the case of new innovative businesses. Each phase demands different capabilities and, as a consequence, different organizational structures and inter-organizational relations to generate, sustain, and exploit these capabilities (Schiuma & Carlucci, 2018). However, it has been a change of focus on university-industry collaboration, to students and alumni rather than on research and faculty (Wright et al., 2017).

Theme	Traditional perspective	Emerging perspective
Why	To generate direct financial returns	To provide a wider social and economic benefit to the university ecosystem
What	Academic spin-offs; licensing; patents	Student and alumni start-ups; entrepreneurially equipped students; job creation in the local region or state
Who	Academic faculty and post-docs	Students; alumni; on-campus industry collaborations; surrogate entrepreneurs
How	TTOs; science parks	Accelerators; Entrepreneurship garages; student business plan competitions; collaborative networks with industry and alumni; employee mobility; public–private 'incubators'

Figure 3.2: Traditional and emerging perspectives on how the university takes on entrepreneurial roles (Source: (D. S. Siegel & Wright, 2015))

Swedish Agency for Growth Policy Analysis did a study in 2018 where they investigated what factors stimulate and increase the likelihood of university-industry collaboration within innovation. (Sjöö & Hellström, 2018).

Time-frame for intervention/change	Actor variables	Environmental variables
Short term	Resources (funding, monetary incentives)	Government incentives (e.g. legislation and monetary incentives)
	University organization and IPRs	
	Boundary spanning functions	
Medium term	Collaborative experience	Geographical context: Regional orientation (entrepreneurship and R&D intensity)
Long term	Culture	Geographical context: Proximity, R&D intensity, entrepreneurship
	Status/centrality of actors (R&D intensity, excellence, and size)	

Figure 3.3: Enabling factors for university-Industry collaborative innovation (Source: (Sjöö & Hellström, 2018)

The hypothesis of the first enabling factor, resources (monetary resources, time and other), is how its availability is crucial for the collaboration to exist, thus it precedes the other identified factors. Resources can be seen as a creation of an incentive system, as well as supporting infrastructure for collaboration (Sjöö & Hellström, 2018).

The existence of a supporting infrastructure for collaboration can be passive, only to fulfill facilitation for collaboration, or active inter-mediation through liaison (Sjöö & Hellström, 2018). University-affiliated incubators can also act supporting infrastructure, through knowledge transfer between university and industry (Bergebal-Mirabent, Lafuente, & Solé, 2013). However, excessive bureaucracy is perceived as a barrier of effective technology transfer (D. Siegel, Waldman, & Link, 2003; Franco & Haase, 2015). Further, Sjöö and Hellström (2018) imply an excessive legal framework exacerbates collaboration (Franco & Haase, 2015). If the arrangements around IPR are imprecise, it tends to hinder collaboration (Locket, Kerr, & Robinson, 2008).

The collaborative experience, on the university level as well as for companies, is identified as an important factor to stimulate further collaboration (Schartinger, Rammer, Fischer, & Fröhlich, 2002; D'Este & Patel, 2007; D'Este & Perkmann, 2011). Among industry actors, research indicates companies with collaborative agreements with other actors, tend to stimulate collaboration in general (Arauzo-Carod & Segarra-Blasco, 2008). Further, even companies with previous unsuccessful collaborations with the university are positively associated with the likelihood of interacting with universities again (Tödtling, Lehner, & Kaufmann, 2009).

The cultural aspect may either foster or hinder collaboration. The university care for academic freedom and contrarily, companies may consider academia as out of touch with the *"real world"* (Locket et al., 2008). However, researchers believe such barriers can be conquered through social interaction, which may develop a shared language and commitment (Gertner, Roberts, & Charles, 2011; Locket et al., 2008). Additionally, the cultural factor of different time horizons, where companies often work within a shorter time-to-market than the usual time horizon for university commercialization, may hinder collaboration (Locket et al., 2008; Fontana, Geuna, & Matt, 2006).

Regarding the size of the firm, several studies conclude large companies to have a higher number of collaborations with universities than small ones (Tödtling et al., 2009; Fontana et al., 2006).

The enabling factors influenced by the environment are based on either the geographical context of the collaboration, or its policy context, e.g. government incentives or regulation. The government can by instance provide monetary incentives, which stimulate collaboration (Bayona, Marco, & Huerta, 2003). Regarding the geographical context, the R&D intensity in the region increases the likelihood of collaboration, e.g. high RD activity makes university

TTOs perform more efficiently (D. Siegel et al., 2003). If actors cross in tangible ways, for example through innovation networks, the probability of collaborative activities is higher (Locket et al., 2008). Hence, the physical encounter matters (Scherngell & Barber, 2011). Further, a high presence technology is positively related to collaboration and spin-off creation (Bergebal-Mirabent et al., 2013).

3.4 Entrepreneurship

There are several enabling factors within the decision process for an individual to jump into uncertainty and becoming an entrepreneur by starting a venture. One of the environmental factors is believed to be presence of successful role models. Another catalyst is dissatisfaction with the current employment or situation (Katz, 1990). Further, Radosevich (1995) suggests external sources, where people interested in entrepreneurship can meet experienced entrepreneurs and get influenced, can be a strong influence. Incubators and research parks are strongly associated by entrepreneurs with this organized networking, as one of the most important benefits (Radosevich, 1995).

3.4.1 Corporate entrepreneurship

Entrepreneurship has in recent years turned away from the individual perspective and established itself within existing large corporations and businesses, creating a new area of study referred to as *"intrapreneurship"*. Possibly the broadest definition regards intrapreneurship simply as entrepreneurship within an organization. In this definition the intrapreneurial process has the main purpose and objective to create new business ventures, however it stretches over other innovative activities and dimensions inside the organization boundaries, such as development of new products, technologies, strategies and competitive postures, product and service innovation, process innovation, self-renewal, risk-taking, pro-activeness, and competitive aggressiveness (Antoncic & Hisrich, 2003).

However, corporate innovation and corporate entrepreneurship must be differentiated, even though they are closely related and dependent. The most important and obvious differentiation is the element of venture creation included in the field of the corporate entrepreneurship. In large corporations these venture creation activities often take labels such as incubative entrepreneurship (Schollhammer, 1981, 1982), corporate start ups or corporate venturing

(Sharma & Chrisman, 1999). In many ways, intrapreneurship assimilates entrepreneurship, here referred to as external venture creation in the form of start ups, however there are relevant differences in the environmental conditions and prerequisites. According to H. W. Chesbrough (2003) the intrapreneurs have opportunities far out of reach for the entrepreneur, the major advantages of intrapreneurship compared to entrepreneurship concerns areas such as extensive resources, established channels and structures. However, in contrast, entrepreneurship often has a built-in ability to move rapidly and being creative in their product development processes which large established corporations lack (Chesbrough, 2003). Radosevich (1995) mentions several differences between large and small firms concerning the commercialization of technologies. Some of the identified benefits of a large company are market power, established linkages to key actors, access to capital markets and potential synergy with current products and operations (which may enable fast scale). However, the small firm has the ability to rapid movement, is less bureaucratic, often have a stronger commitment to the technology, and has the entrepreneurial management for early-stage growth (Radosevich, 1995).

Further, literature seems to agree established large companies often struggle with creating an entrepreneurial environment. Entrepreneurial conditions are often characterized by a culture that accepts and encourages creativity, failures and change. These seem to be in contradiction with conventional corporate culture, whereas areas as risk aversion and fear of failure often are in center (Thieme, 2017). In order to be successful in the field of intrapreneurship, large established companies must overcome the cultural barrier. Further, Hill and Rothaermel (2003) put internal corporate politics as another barrier for intrapreneurship. Even though large companies might have extensive resources, the competition of the resources within the organization is still intense. Consequently, as the distribution of resources, power and influence might shift within the organization, conflicts might arise between different groups of interest. In in order to have sustainable and financial profitable success and overcome most of the obvious obstacles with intrapreneurship, often takes several years (Biggadike, 1979).

3.4.2 Student entrepreneurship

Taking on entrepreneurial roles among students have become increasingly common (Kolvereid & Åmo, 2007). The evolution of entrepreneurship education (Finkle, Kuratko, & Goldsb, 2005; Solomon, 2007) has led to the development of courses and programs with a focus on engaging the student in entrepreneurial practice (Neck & Greene, 2012) or building upon stu-

dents own independent entrepreneurial activity (Pittaway, Gazzard, Shore, & Williamson, 2015), when the intention is to develop entrepreneurial competency (Lundqvist & Middleton, 2017).

Despite the beginning of an evolution of entrepreneurial education, research from 2013 made by the incubator Drivhuset shows entrepreneurial education is still lacking among Swedish universities. The research investigated if entrepreneurship was a common part of the education, and the conclusion showed only one-third of the students have entrepreneurial training as a part of the education, regardless if they aim to become an employee or entrepreneur. Accordingly, 40 % of the students stated they would like to see more entrepreneurial elements within their education (Shams & Westerback, 2013).

Further, the research concluded seven out of ten of the students at universities in Sweden are positive to start a business, still, only 7% are actually running their own business. Hence, there is a large gap between students interested in entrepreneurship and the number of students entrepreneurs. Four out of ten students stated it seems hard or very hard to start up a business. Shams and Westerback (2013) asked the students with a negative mindset towards starting their own business about the reasons behind it, and stated it was mainly due to economic uncertainty, lack of time and resources, rather than a lack of interest. Another common reason for not trying the entrepreneurial path was not knowing what is required to start a business (Shams & Westerback, 2013).

3.5 Surrogate Entrepreneurship

The term Surrogate Entrepreneurship was first introduced by Radosevich in 1995. He presented a model for commercialization of public-sector technologies, whereof two different kinds of entrepreneurs can be employed for transferring and commercializing the technology. Besides the most common type of entrepreneur in the literature, where the inventor of the technology is spun off and assumes the role as an entrepreneur, he presented an alternative model where an external entrepreneur is recruited. Radosevich named the first presented alternative the inventor-entrepreneur, since the employees are typically the inventors of the technology actively seeking to commercialize their invention, and the second Surrogate Entrepreneur, who is not the inventor but acquire rights to the technology (Radosevich, 1995).

Radosevich (1995) claims both types of entrepreneurs have unique advantages and disadvan-

tages, although Surrogate Entrepreneurship was developed as a reaction to the low success rate of inventors trying to commercialize their technologies. The main barrier for the inventor entrepreneur to take their technology to the market is a lack of business knowledge and experience and the difficulty of taking on the entrepreneurial role. Further, the inventor tends to be focused on the perfection of the technology rather than the technical aspects required to meet the market demand and more often develops applications without reaching the market. However, the primary advantage of the inventor is his or her knowledge of the technology and thus no expertise is missed out due to it is left with the inventor. Regarding the technical knowledge, Radosevich (1995) also states in favor of the inventor entrepreneur is his or her strong commitment to the technology (Radosevich, 1995).

The main argument for enrolling Surrogate Entrepreneurs has been to help technology ventures to overcome the barrier of commercialization (Lundqvist, 2013). Entrepreneurial experience and accumulated business knowledge, including professional networks, are other advantages connected to Surrogate Entrepreneurship. Further, surrogates can benefit from having easier to access risk capital as well as they are less dependent upon the existence and extent of support infrastructure, and also not biased to the technology (Radosevich, 1995).

The main disadvantage is the Surrogate Entrepreneur's lack of specific knowledge around the technology. However, Radosevich (1995) suggests the technical knowledge can be assured if the inventor can act as initial support. Over time, the Surrogate Entrepreneur may be able to acquire required technical capacity by importing technologies, cooperating with other actors, and increasing the internal technical capabilities through the business competence and network skills (Radosevich, 1995).

Lundqvist and Middleton (2017), state Surrogate Entrepreneurs should be seen as a complement rather than a replacement to the inventors in order to be successful, which aligns with Radosevich (1995) suggestion of the initial technical support of the inventor (Radosevich, 1995). Another critical aspect of the Surrogate Entrepreneur model to be successful is the timing. In cases when the Surrogate Entrepreneur does not participate in the early formation of the venture, it has been found by studies, the surrogate has little impact on the actual venture development(Gulbrandsen & Bjørnåli, 2010; Vanaelst et al., 2006; Clarysse & Moray, 2004; Lundqvist, 2013).

3.5.1 Student Surrogate Entrepreneurship

Literature has initially positioned a Surrogate Entrepreneur as an individual with business experience, and not as a less experienced student still operating under an educational course format. However, many professionals in the industry and even experienced entrepreneurs lack both the time and incentives to engage in new early-stage technologies. Hence, an opportunity opens for students to support in driving to early-stage sustainable innovation by becoming Student Surrogate Entrepreneurs, SSEs (Lundqvist & Middleton, 2017). There does not seem to be one decided definition of a SSE, however by combining the results of Radosevich (1995) and Lundqvist (2013) the authors of this thesis can provide a broad definition. For the purpose of this study a SSE will be defined as a student taking on the role of a surrogate entrepreneur, in the sense which Radosevich described, with the purpose of creating a new venture, business or company. A SSE is differentiated from other entrepreneurs as they do not run their own ideas with the purpose of venture creation. This definition is used when identifying existing cases of applying SSEs, which is the foundation for the empirical findings.

The shift from an experienced entrepreneur to a student comes with some benefits according to Lundqvist (2013). Having students as Surrogate Entrepreneurs could reduce the risk of engaging the surrogate to late into the innovation process, due to a more willingness to engage in early stage-ideas compared to more experienced entrepreneurs (Lundqvist & Middleton, 2018). Younger and less experienced Surrogate Entrepreneurs can be argued to be more flexible positioned from the start and more willing to learn from technologists, while effectuating under uncertainty (Lundqvist, 2013).

Further, existing action-based venture creating entrepreneurship programs primarily rely on students as the idea generators for the future ventures, and not on students driving external ideas (Lundqvist & Middleton, 2018). However, Cope and Watts (2000) argue students potentially can gain learning-by-doing experiences by connecting them with early-stage ideas and act as Surrogate Entrepreneurs. Nonetheless, there are only rare examples of innovative ideas from the broad entrepreneurial ecosystem, e.g. unrealized ideas from public or private R&D, associated with the university (Lundqvist & Middleton, 2017).

Hence, applying students as Surrogate Entrepreneurs seems to have some benefits compared to a more experienced entrepreneur. Also, to become a Surrogate Entrepreneur seems to be a possible learning-by-doing experience for the students. Nonetheless, there are only a few examples of Student Surrogate Entrepreneurs, as well as the literature regarding the

phenomenon is limited.

3.6 Summary theoretical background

It appears to be quite an extensive amount of literature regarding open innovation and how open innovation might affect the firm. The theoretical background therefore provides insights in how, in theory, inside-out innovation, corporate innovation and university-industry collaboration specifically might affect the company, as those are the areas most relevant for the purpose of this study.

However, the literature regarding SSE seems scarce. Mainly, there are a few major scholars arguing of the effects of applying a Surrogate Entrepreneur. Therefore, since even fewer of the scholars actually bring up the effects and consequences of using students as Surrogate Entrepreneurs, this study puts emphasis on the empirical study of some existing solutions using SSEs. Hence, the authors argue the greatest learnings can be achieved through an empirical study rather than literature study.

In the following chapter, Chapter 4, the authors present the findings of an empirical study which aims to explore and investigate the concept of Student Surrogate Entrepreneurship. The empirical study consist of (1) findings from five studied existing solutions of applying SSEs and (2) findings from case study, including an empirical study of the non-experienced case organization (in terms of Student Surrogate Entrepreneurship) and its local ecosystem, also non-experienced, regarding opportunities and blockers for applying SSEs on internal ideas.

Chapter 4

Empirical Findings

This chapter presents the empirical findings, based on the collected data from the in-depth semi-structured interviews. Interviewees origin from potential stakeholders when applying SSEs on company ideas, identified in the theoretical framework as well as a result of iterative empirical data collection. Further, the empirical findings are structured and differentiates between those from existing solutions applying SSEs and those from the case organization and its local ecosystem. The interviewees with experience from existing solutions aim to provide insights and learnings from different structures of implementing SSEs. The findings from stakeholders within the local ecosystem of the case organization represent possible stakeholders when applying SSEs on the case organization's internal ideas and aim to provide insights on the specific possibilities and blockers for the case organization and is part of the case study. Below an illustration of the structure of chapter 4 is presented.

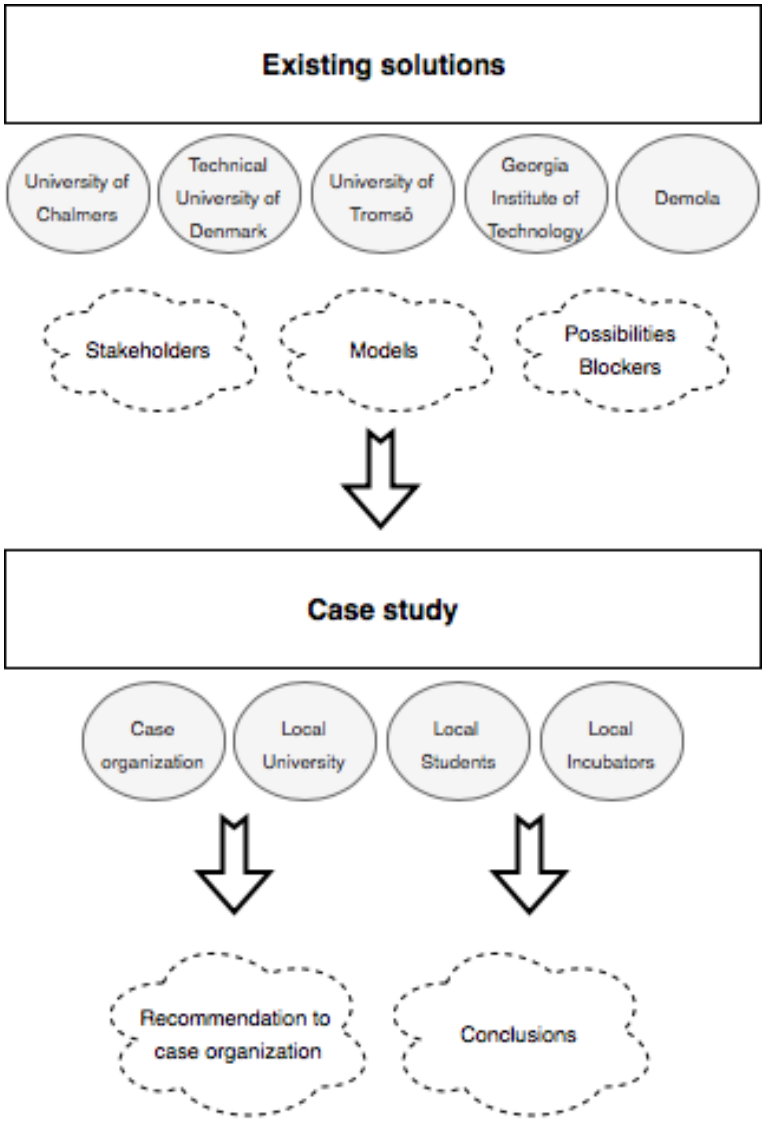

Figure 4.1: Structure of Chapter 4 - Empirical Findings (Created by the authors)

4.1 Findings from Existing Solutions of Applying SSEs

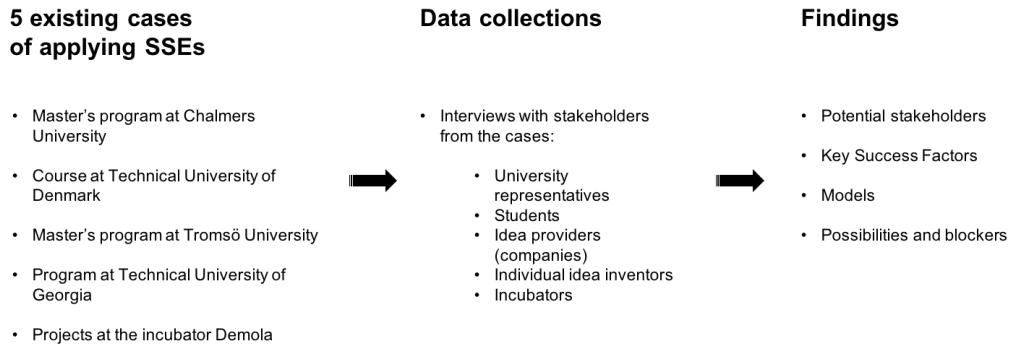

Figure 4.2: Structure of findings from existing solutions of applying SSEs (Created by the authors)

This chapter provides the findings from interviews with different stakeholders within the five existing cases of applying SSEs, which the study investigate thoroughly in order to explore the phenomenon of Student Surrogate Entrepreneurship.

Based on a previous study which lists universities providing courses or programs with venture creation as its purpose, several universities offering their students to become SSEs, were identified (the list can be found in Appendix C). All universities from the list was contacted, and the universities which replied and appeared to be applying the concept of Student Surrogate Entrepreneurship, were pursued further. Some of the other identified existing solutions, such as applying SSEs on company ideas through incubators, were identified as a result of the exploratory approach of this study and through personal recommendations.

From the empirical data gathering, and anchored in the literature review, five different themes related to implementing SSEs on company ideas were identified and used as a framework when exploring the concept through the existing solutions. The themes are; motives, ownership model, resources and costs, matching SSE profile with idea and characteristics of the idea.

4.1.1 Introduction to interviewees

The interviewees providing the findings from existing solutions of applying SSEs derive from the different stakeholder categories:

- University
- Student
- Idea provider
- Idea inventor
- Incubator

The difference between the idea provider and the idea inventor is the idea provider represent an organization giving away an idea (e.g. a company) and the idea inventor is the individual who invented the idea.

Table 4.1: Table of interviewees connected to stakeholder (Created by the authors)

Name	Stakeholder	Name of organization
Mats Lundqvist	University	Chalmers University
Jakob Andersen	University	Denmark Technical University (DTU)
Alexander Utne	University	Tromsö University
Jonathan Guiliano	University	Georgia Institute of Technology
Viktor Börjesson	Student	Chalmers University
Ayda Zamany	Student	Chalmers University
Anna Trysberg	Student	Chalmers University
Jenny Gustafsson	Idea provider	SAAB
Raino Kauppinen	Idea provider	Stora Enso
Per Cederwall	Idea inventor	SAAB
Janne Eskola	Incubator	Demola

Mats Lundqvist, professor at Chalmers University in Entrepreneurship at the Division of Entrepreneurship and Strategy, and also the Director of Chalmers School of Entrepreneurship, was interviewed with the objective to investigate Chalmers' model of implementing SSEs in their master's program.

Jakob Andersen, lector at DTU Centre for Technology Entrepreneurship and Ph.D. researcher, was interviewed to understand the DTU model of applying Student Surrogate Entrepreneurs through the course *"HardTech Entrepreneurship"*.

Alexander Utne, lector at the University of Tromsö, was interviewed to understand why a venture creation program applying SSEs recently was shut down.

Jonathan Guiliano, the director of Georgia Tech's program Technology Innovation: Generating Economic Results, TI:GER Program, in which it occasionally applies SSEs on ideas. He was interviewed to increase the insights and driving forces of another university-based structure of applying SSEs.

Viktor Börjesson, who graduated from Chalmers School of Entrepreneurship in 2014, was interviewed to get a previous surrogate entrepreneur's perspective on applying SSEs. Börjesson is the CEO and co-founder of ReVibe, a company sprung from the master's program at Chalmers, based on a patent provided by SAAB.

Ayda Zamany, was interviewed to get a perspective from a previous SSE, from a new venture project, which did not succeed. who graduated from Chalmers School of Entrepreneurship in 2014, added insight on the student perspective on SSE. During the program, she co-founded AgroPaper, which she worked with six months after graduation until it was shut down. AgroPaper was based on a patent from Stora Enso.

Anna Trysberg, graduated from Chalmers School of entrepreneurship in 2015, was interviewed with the purpose to get enhanced insights in how the Chalmers program was conducted and experienced from a student's perspective.

Jenny Gustafsson, investment manager SAAB Ventures, was interviewed to give insight on the perspective of the idea provider and company. SAAB Ventures has at several occasions provided Chalmers master's program with ideas in the form of patents, in which Gustafsson acted as an advisor for the students.

Raino Kauppinen, worked as an R&D manager at Stora Enso, when the company took part of the Chalmers Entrepreneurship master's program. The objective with interviewing him was to gain perspective of an idea provider on a SSE project which did not succeed as a venture.

Per Cederwall, project manager at SAAB, was interviewed to gain the inventor's perspective of a previous SSE collaboration. Per invented, together with one other SAAB employee, the patent which later led to the incorporation of ReVibe from the Chalmers program.

Janne Eskola, director of partnerships at Demola, was interviewed in order to understand

how a profit-driven organization can act as an intermediary in projects between students from universities around the globe and leading companies, which have resulted in SSEs.

4.1.2 Introduction to identified existing solutions of applying SSEs

As described earlier, five cases of different structures and setups for applying the concept of Student Surrogate Entrepreneurship have been identified and explored thoroughly, as the first part of the empirical study (see Figure 2.2.).

4.1.2.1 Chalmers School of Entrepreneurship master's program

Chalmers University in Gothenborg, Sweden, has since 1997 been running a two years master's program in entrepreneurship design. Students with engineering background are the most common participants, although students of other disciplines are invited to apply (e.g. law, business, science, design and economics). During the first year of the program, the students take courses in different disciplines within entrepreneurship and innovation, providing them with the required knowledge and background. The second year, the students are provided with an idea, which they are supposed to drive for a year with the purpose of incorporating a new venture and truly take on the role as an entrepreneur.

The ideas originate from academia as well as the industry. About 30% of the ideas originate from private companies. 20 idea providers with ideas are recruited each year by Chalmers Ventures (the university incubator) and pitch their idea to the class, which has the authority to decide which 15 out of the 20 ideas will take part in each year's class.

Once the students have been put into teams and matched with idea providers (which is done by Chalmers), a contract is signed between the students, the idea provider and Chalmers, through Chalmers Ventures. The contract period is two years, and states a lock-in, i.e. the different parts need to agree to earlier closure if wanted. The contract also regulates an ownership model, where it is stated how the ownership share should be divided in case of incorporation. If a company is not created, the properties and findings from the project are protected in the contract, meaning the student are not allowed to bring it out of the project. The ownership division varies from case to case since it often depends on the characteristic of the idea. However, the current general equity distribution is:

- Idea provider - less than 50 % (usually 30-40 %)
- Students - at least 1 % each initially (usually around 20 % in total)
- Chalmers Ventures - 12.5 %
- Investment pool - the remaining part

4.1.2.2 HardTech entrepreneurship course at Technical University of Denmark

The Technical University of Denmark, DTU, offers a course during 13 weeks called HardTech Entrepreneurship. The course gives participating students the opportunity to explore ideas or patents provided from companies, DTU researchers, students or non-profit organizations, with the purpose of commercialization through a spin-out. During the course, the students have lectures on relevant areas, such as prototyping, market validation and assessment. The students are organized in teams of four or five engineering students from cross-disciplinary backgrounds, based on their answers in a competence survey.

Participating companies pay a fee to join the program, and based on the number of project a company wants to put in the program, the fee varies. A single project costs 65 000 DKK. Further, students engaging with company ideas and IP are required to sign an extensive non-disclosure agreement and all IP created during the course is fully owned by the company. If a spin-out is incorporated after the course, there is a new negotiation between the students and the company on how to continue with the venture regarding ownership. Between 25% to 33% of the projects within the course results in incorporation of a new business.

4.1.2.3 Master of science in Business Creation and Entrepreneurship at Tromsö University

For ten years, from 2008 to 2018, Tromsö University offered their students a master's program where students were given ideas from scientists (mainly within the fields of biotech and technology) with the objective to commercialize them. However, the program was recently shut down. The ideas were often very technical and patents were therefore involved. During the first terms, the students were given a theoretical background of entrepreneurship and then they were presented with an idea to work with.

Students from interdisciplinary backgrounds were invited to apply for the master's program and were formed into teams, where each team took on one idea. The inventor, i.e the

scientist, behind the idea was invited to be involved as well, even though the degree of involvement sometimes varied. If a venture was created, the students were given a share of ownership, however, the share´s size varied between different cases and there was no structured way to handle ownership and contracting. Often the ownership was quite low, for example, students could get 2-3% ownership. The rest was split evenly between the inventor, the university and the TTO at Tromsö University, Norrinova.

4.1.2.4 Georgia Tech TI:GER Program

Georgia Tech in the US offers a 16 months long education called Technology Innovation: Generating Economic Results (TI:GER Program), where students work in teams throughout the entire semester on different projects. The TI:GER program aims to combine education and practical knowledge in how to successfully commercialize a technology or idea. The aim is not necessarily to create new ventures, although this has been the outcome in several cases. Thus, the students have acted as SSEs. The program has been running since 2002 and was started through a national grant. Projects are mostly gathered from Ph.D. research and university IP. However, the program is currently undergoing a transition, where the program management is restructuring to open up for more companies to join the program. Hence, they are restructuring for a higher degree of applying SSEs on company ideas.

The students come from interdisciplinary backgrounds and form teams themselves in the beginning of the semester, even though the university have influence over the matching with a project. Teams normally consist of one Georgia Tech Ph.D. candidate, two MBA students, and two law students.

4.1.2.5 Demola

Demola was founded in 2008, through an initiative from the corporate side. It is a profit-driven incubator with a global presence in 16 countries. Companies bring challenges and problems they need to solve to the incubator, and Demola connect students and specific challenges from companies with a focus on innovative solutions. During eight weeks, a group of multi-disciplinary students works on solving the company's problem. The projects do not necessarily have the purpose to create new ventures, although this is often the outcome. The students participating outside their education, however in some of the countries, participating students can also receive university credits for taking part in a Demola project,

as a course.

If new IP is created during the project, the students own the full rights of the IP. However, potential IP the companies bring into the project is considered background information and is owned by the company, secured through a contract the parties sign. In case a project leads to a new venture creation, there is a negotiation between the students and the company about how the ownership should be divided.

At Demola, participating companies pay a fee of either 7 500 euros per project or a subscription of 70 000 euros a year for unlimited number if projects (i.e. a full year subscription). Demola provides the students with an elaborated working process and perform the team matching and composition.

4.1.3 University perspective

This section presents the empirical findings from the University perspective, structured from the five identified themes.

4.1.3.1 Motives

University	Concerning motives
Chalmers	• Connect ideas from academia as well as companies, with entrepreneurs able to drive them • Provide a practical learning journey for students • Push innovation • Bridge the gap between university research and commercial reality
DTU	• Create a commercialization funnel for company ideas and research, i.e to be an incubator for new technology and to build start ups • Educate engineers willing and capable of commercializing technologies • Allow researchers a way to test their technology • Strengthen ties and reputation with the industry • Brand the university and improve reputation
Tromsö	• Provide students with a relevant education • Increase the degree of commercialization of research in the area
Georgia Tech	• Bring university IP to the market • Educating students in how to bring IP to the market • Allowing companies to try out ideas at a low cost

Chalmers School of Entrepreneurship master's program
The founders of the program realized there were many ideas, both in the academic world and at companies, as well as a lack of entrepreneurs to drive ideas. The master's program at Chalmers aims to be a complete learning journey within entrepreneurship for the students, as well as to create real value while obtaining an academic education. Lundqvist claimed, by letting students become Surrogate Entrepreneurs they can train people to have more entrepreneurial careers.

Further, regarding Chalmers Ventures (the university incubator) interest in being involved in the program, Lundqvist stated it is mainly financial. He claims 75% of their revenue is from created ventures from the program.

The HardTech Entrepreneurship course at DTU
Andersen expressed the background of the course is a potential to commercialize non-utilized patents and technologies, initially from massive resources within the university (such as IP and patents), as well as the university had talented students who were eager to do it. Further, he mentioned the course is a way for DTU to collaborate with industry and to create students who make a difference, who can be tracked back to DTU and thus contribute with a good reputation for the university.

Regarding the students perspective, Andersen experienced their interest and intrinsic motivation in the course is to use their academic knowledge in a practical context. For companies, he believes the course provides a new and low-cost way to explore new paths of innovation and ideas which are often out of companies core businesses, as well as he has experienced it could be a way to brand the company to students.

Master of science in Business Creation and Entrepreneurship at Tromsö University
Utne, expressed the master's program hoped to increase the number of commercialized research and probably at lower cost as well (compared to experienced entrepreneurs or the scientists commercializing it). One of the reasons liable for the shut down of the program was due to a lack of motivation from the students. Utne believes it was partly due to the students were expected to put a lot of effort into the projects, receiving the same output. Further, he experienced the scientists and the students sometimes had different intrinsic motivations, whereas in some cases the scientists were more interested in researching than commercializing.

TI:GER program at Georgia Tech
According to Guiliano, the reason for changing the program to allow more company projects,

is the verified interest from companies, seeking a way of trying out an idea at a low cost as well as they are searching for new ways to access and conduct innovation. Further, he believes there are a lot of large global companies in the region of the university (more than 20 companies have their R&D departments located in Georgia in the area called Technology Square) have contributed to the increased interest and attention in the course. Further, students are often expecting and looking for projects with shorter time horizons than the university can provide.

4.1.3.2 Resources and costs

University	Concerning resources and costs
Chalmers	• Idea providers do not pay a fee to participate • Students are not provided with any financial resources for the projects • Companies required to support students through a company representative (ideally, the inventor and one person with a broader mentoring role) • Supervisors from the university • Educational courses within entrepreneurship • Chalmers Ventures recruit ideas through their network and support the students within different entrepreneurial tasks
DTU	• Companies obliged to pay a fee to participate • Student teams are given 5 000 DKK to their projects • University provide comprehensive testing facilities • Students have lectures • University supervisor during the project • Companies required to provide a contact person for the students
Tromsö	• Idea inventors did not pay a fee to participate • Idea inventors often failed to participate in the projects • Supporting courses from the university • Supervisor from the academic side
Georgia Tech	• Idea providers do not pay a fee to participate • No financial resources for the students • The university provide with courses within innovation and technology commercialization • Law and business oriented mentors from the university

Chalmers School of Entrepreneurship master's program

The students are not provided with financial resources, instead they are encouraged to search for it themselves (as a real entrepreneur). Further, during 20 years Chalmers never had a student who has burned out, and Lundqvist believes the reason is all the support provided and never pushing the students.

Except for Chalmers Ventures recruiting ideas to the program through their network, Lundqvist mentioned the incubator is of value for the students by their knowledge around venture creation, contracting as well as they may do further investing in the ventures.

The HardTech Entrepreneurship course at DTU
Except for the contact person from the company, Andersen explained the company has to ensure students have some connection to more technical resources from the idea provider, to secure technical advisory.

Master of science in Business Creation and Entrepreneurship at Tromsö University
According to Utne, the ideas within the program at Tromsö University had a quite high technical novelty because the ideas originated from scientists, which was a contributing reason to why the technical support was considered important. Further, he considers the involvement from the scientists was too low, suggesting some of them were not interested in participating at all, making it very difficult for students to fully understand some of the technologies.

4.1.3.3 Ownership model and contracting

University	Concerning ownership model and contracting
Chalmers	• Shared ownership gives incentives to all stakeholders • Less than majority for idea provider to secure their aim to let someone else drive • Investment pool facilitates later investment rounds • Encourage companies to give a part of their share to the individual idea inventor
DTU	• Students sign off rights to IP • Negotiation regarding ownership at the end of project
Tromsö	• Small share of ownership for students
Georgia Tech	• Customized agreements

Chalmers School of Entrepreneurship master's program
The reason why Chalmers wants the idea provider to own less than 50 % of a future venture, Lundqvist claimed, is because if a company is sincere to have an external providing source, they need to open up and not require to own the majority. If the company actually want to drive it themselves, the required number of less than 50 % scares away them, which Lundqvist believes is good. Also, when pushing down the idea provider's share it results in

a bigger share in the investment pool, thus it gives increased incentives for others to push the idea into the market by investing in the idea in later investment rounds. Further, Lundqvist argues by letting the students get a small share initially they create an incentive to figure out if they want to follow through with running the business, and if so, they can negotiate for more to continue.

According to Lundqvist, the current model, in which a best practice division is used, makes a fair balance from the beginning and results in more sustainability and success than their previous, less structured ownership model and contracting process.

The HardTech Entrepreneurship course at DTU
According to Andersen, the companies need to be assured their assets are *"safe"*, otherwise they would hesitate to join the program. In order to secure this, the students sign off on all rights of IP created during the project to the company. He also mentioned the fee the companies pay is the reason companies can require extensive rights. However, once the students realize it is an interesting project and want to continue with it after the course, they tend to be disappointed with not possessing any rights to a new venture. Nevertheless, since the students are the drivers, they are responsible for a big part of the future outcome, and according to Andersen the students often have a strong position in negotiations due to this. Some companies believe they have done all the work by coming up with the idea and for example expect 80% ownership, which is unreasonable expectations according to Andersen.

Master of science in Business Creation and Entrepreneurship at Tromsö University
Utne believes the ownership setup at Tromsö, in which the students got around 2-3 % each, provided the students with a too small ownership share, which evidently affected their intrinsic motivation to continue and the time the students put into the project. He mentioned there were many reasons why the program was shut down, whereof the ownership model was one of them.

TI:GER program at Georgia Tech
There is no best practice of ownership for the project resulting in new ventures. It always depends on the situation and often very case specific solutions exists, according to Giuliani. However, the laws in the US differs from Europe. Giuliani explains, in the US, according to the Bayh-Dole act, there is legislation which regulates IP originating from universities to belong to the university.

Further, Giuliani mentioned there is a lot of paper-work involved in the program, such as

non-disclosure agreements to protect the IP. He believes bureaucracy of this kind often slows down projects, why he tries to keep the paper-work as light as possible.

4.1.3.4 Matching SSE profile with idea

University	Concerning matching SSE profile with idea
Chalmers	• Students with interdisciplinary backgrounds • University create student teams and match them with idea • Idea providers are not promised any student competences • Idea providers do not have influence on which students they get • Student team make wish-lists on ideas • Aim for diversified teams • Teams consist of 2-3 students
DTU	• Students with interdisciplinary backgrounds • Can not promise student competences to companies • University form team and match with idea • Students individually make wish-lists on ideas • Aim for at least one business student • Teams consist of 4-5 students
Tromsö	• Students with interdisciplinary backgrounds • Objective to create diversified teams • Students picked their own teams to some extent • The university had influence on the matching with ideas • Teams consisting of 1-3 students
Georgia Tech	• Students with interdisciplinary backgrounds • Students have some influence on which project to run • Mix of MBA and PhD students • Teams consisting of 5 students

Chalmers School of Entrepreneurship master's program
Lundqvist explained how Chalmers creates teams based on the students' competence and background. The teams make a wish-list for which idea to pursue, which lays the foundation for the matchmaking of ideas which the university does. Further, he considers the team composition to be of high importance, nevertheless team conflicts can and will occur.

The HardTech Entrepreneurship course at DTU
Andersen expressed it is hard for DTU to promise competences to the companies because they cannot control which students will apply for the course. The teams are formed based on a competence survey, however, Andersen claimed it is always a sub-optimal matching. Further, DTU encourages the teams to recruit other students to the team if any competences

are missing.

The course at DTU recruit technical students from all programs and also aims for at least one business/marketing student within each team. By having one business or marketing student, the team often gain another perspective and complementary competence, according to Andersen.

4.1.3.5 The characteristics of the idea

University	Concerning the characteristics of the idea
Chalmers	• Technical novelty or technical base with a global potential • Early stage • Avoid long TTM
DTU	• Some technical novelty • Outside company core business • Avoid to early stage ideas
Tromsö	• High technical novelty • Long TTM makes students loose motivation
Georgia Tech	• Complex ideas • Patent or IP involved • Long TTM can cause contradictions in expectations between the students and idea providers

Chalmers School of Entrepreneurship master's program
The reason for only accepting ideas with some technical base is because Chalmers is a technical university, but also from experience. According to Lundqvist, Chalmers has tried more conceptual ideas in the past and those have proven to be less successful. He believes the reason is they are not tangible enough to start work with, i.e. there are no assets to *"make it happen"*. Further, according to Lundqvist, ideas should be in an early state in order to be interesting for the students, since if they are too developed the students question what they can add, by his experience. On the other hand, if they are in a too early stage and have ten years time to market, TTM, students tend not to chose them.

The HardTech Entrepreneurship course at DTU
Andersen explained idea cannot be in a too early stage, due to it makes it hard for the students to do something with it as well as it does not engage students since it is not concrete enough. On the other hand, if the idea is too developed, the students have difficulties to

contribute technologically. He also mentioned how the level of investments to showcase technology is a substantial barrier. It is a blocker if it is too expensive to try it. Regarding patents, Anderson stated patents have proven in most cases not to be the foundation for commercial benefits. However, Andersen concluded the benefit of patents appears to be protection within the market.

Master of science in Business Creation and Entrepreneurship at Tromsö University
The ideas provided to the program at Tromsö University had a high technical novelty, with a very long TTM. In some cases, further research was required before they could be presented at the market. As commercialization appeared to be far away for the students (many of the ideas had an estimated ten years time to market), some of the students seemed to lose their motivation, according to Utne.

TI:GER program at Georgia Tech
The ideas in Georgia Tech's program have historically mostly been complex, according to Giuliani. They often concern some kind of IP or patent and it is common they need a lot of federal or government approvals, such as from the Food and Drugs Administration. This affects the TTM, which can create contradictions in the expectations between the students and idea providers.

4.1.4 Student perspective

This section presents the empirical findings from previous students who the authors argue have acted as SSEs. The empirical data is structured from the five identified themes.

4.1.4.1 Motives

Student	Concerning motives
Börjesson	• Practical experience • Opportunity to become a SSE
Trysberg	• Personal development • Practical experience
Zamany	• Practical experience

Börjesson
Börjesson stated the biggest motives for people, in the master's program, is to get practical experience, leave the academic, gain real experience, and use previous knowledge. The rare opportunity to become a SSE, is according to Börjesson, the program's greatest strength and how this environment is a perfect way to start a venture.

Further, Börjesson believes the value for his project's idea provider, SAAB, is financial and branding. He stated, SAAB wants their invested money back, even though they probably would be satisfied with some kind of result from the students (e.g. the students discover the patent has no potential). Further, even though some companies understand the potential of letting students drive an internal idea, Börjesson believes one of the major problems companies face is their fear to let go of ideas.

Trysberg
Trysberg mentioned that the program at Chalmers fulfilled her expectations and also that she have had use of the education in later stages of her professional life. She believes all the students in her class feel like they have had benefits of the experience, regardless if they continued to drive the business from the program, started a new venture or begin to work within a large corporation.

Zamany
According to Zamany, all students get a different outcome of the program depending on former experiences and their profile. The failure of AgroPaper as a venture does not, in her opinion, mean she is not happy with the program. Her best learning was a new, more hands-on, way of working, increased interest for entrepreneurship and confidence.

4.1.4.2 Resources and costs

Student	Concerning resources and costs
Börjesson	• Access to Chalmers established network • Utilized Chalmers Ventures resources and competences (e.g. lawyers during contracting)
Trysberg	• Advantage to have access to coaching • Positive to be able to apply for funding from Chalmers Ventures • Utilized Chalmers Ventures resources and competences (e.g. lawyers during contracting)
Zamany	• Network from idea provider (e.g. customer base and industry experts) • Monetary resources from idea provider • Project leader from idea provider (also part of the board for the venture) • No technical support • Students not fully responsible over project

Zamany

The idea provider, Stora Enso, Stora Enso provided the students with a network as well as invested 1 million SEK for the students to use in market research, which Zamany expressed facilitated their work. However, she explained the inventor who had developed the product was not a part of AgroPaper to give support as well as they lacked technical documentation of what had been tested prior to the students went on board, which she experienced as a blocker.

Further, Zamany expressed a barrier concerning the idea provider only giving a license to the patent and did not follow through with the product development, which they were responsible for (even though the market appeared ready). Because Stora Enso owned the patent, they did not allow the students to recruit external experts to develop it, nor were they interested in developing it themselves. The students felt only as a marketing company and did not have the full responsibility and power over all parts of the venture.

4.1.4.3 Ownership model and contracting

Student	Concerning ownership model and contracting
Börjesson	• Ownership should be tailored for every case • Companies should lower their demand of high shares
Trysberg	• No specific input because the idea was never incorporated
Zamany	• Disappointment for not possessing the power to negotiate, which was done by Chalmers and idea provider • Too small ownership share for students (28 % in total)

Börjesson

Börjesson proposes companies should lower their demands of ownership. According to him, no experienced entrepreneur would have considered to drive an idea with for example SAAB owning 60 %. He suggests companies should consider the alternative cost, and what would happen to ideas otherwise. Börjesson concluded the incentive have to be big enough for the surrogate entrepreneur to take on the idea as his or her own.

4.1.4.4 Matching SSE profile with idea

Student	Concerning matching SSE profile with idea
Börjesson	• The team composition is of importance • Advantage to not be emotional attached to idea
Trysberg	• Good with being match in teams by Chalmers as it created a diversified group
Zamany	• Difficult to feel passion without influence on which idea to work with

Börjesson

Börjesson expressed the matching process at Chalmers as quite well functioning. However, he understands how it is difficult for the university to match both the right team with students and connect it to an idea. Further, Börjesson believes it is very positive from a business perspective how external entrepreneurs are not emotionally attached to the idea, unlike the inventor.

Zamany

Zamany claimed the companies involved in the Chalmers program expect the students to

be fully committed to the project, which from her experience is hard when the students cannot decide completely on what idea they are going to work with. Further, she believes it is important to feel the passion in order to put a lot of effort into the project.

4.1.4.5 The characteristics of the idea

Student	Concerning the characteristics of the idea
Börjesson	• Advantages with patents as well as more conceptual ideas
Trysberg	• Advantage with ideas not that well explored, as it allows pivoting
Zamany	• Patent not required (in theory it seems more beneficial) • Success is more execution of the idea than the idea itself

Börjesson
According to Börjesson, the advantage with the patent SAAB provided him with, was a sturdy technology which they could search applications for. On the other hand, he believes more conceptual ideas would have given them more freedom, which he sees as conceptual ideas' biggest benefit.

4.1.5 Idea provider perspective

This section presents the empirical findings from the companies which provided the SSE with ideas. The data is structured from the five identified themes.

4.1.5.1 Motives

Idea provider	Concerning motives
SAAB	• Low cost to test if the market is ready for an innovation • Ambition to create a new venture • Achieve ROI
Stora Enso	• Get a new way of thinking and new perspectives • Policy to support university- and student activities • Create a business outside core business

SAAB

By allowing students to test an idea, SAAB hopes to create an new venture which will attract other investors, raise the value of the business and eventually get a Return on Investment, ROI. According to Gustafsson, SAAB in many ways sets out to *"kill the idea"*, meaning to test and question ideas as quickly as possible. In this way SAAB gets the required decision basis to decide whether to cancel or continue a project. SSEs, rather than experienced entrepreneurs or project managers, allow SAAB to perform the testing at low cost. Gustafsson believes there is no real downside for idea providers, and explained they can only take part in the upside.

Further, Gustafsson described how SAAB has brilliant engineers who often provide innovations and solutions, however she emphasizes how engineers are not entrepreneurs, which she considers a problem, since potential business ideas run the risk of not getting commercialized. Hence, students provide a great match to the lack of entrepreneurial drivers.

4.1.5.2 Resources and costs

Idea provider	Concerning resources and costs
SAAB	• The alternative cost to let students drive the ideas is low • Coaching from SAAB was required (active board member) • Scarce support and education from the university
Stora Enso	• Support from idea provider a few hours a week • Idea provider facilitated with experience, guidance and network • More investments in product development required

SAAB

Regarding SAAB's alternative to exposing their ideas to students, Gustafsson explained they would either let the patent go free or just let it *"lay in the drawer"*, i.e. the alternative cost of letting students try on the idea is low. However, she mentioned some challenges of working with younger people who require coaching (e.g. during negotiation, decision-making, etc.). For Gustafsson, this meant to be a quite active board member. On the other side, she experiences younger people as very driven and eager, and further she considers them, for better or worse, naive. According to Gustafsson, students do not always realize some things should be impossible and do it anyway, which sometimes results in success. On the contrary, she expressed, some things really are impossible, which the young students do not always have enough experience and insights to understand. Further, in order for the SSE collaboration to work, she believes the idea provider need to dare let go of control.

Gustafsson experienced the support from the university as important, especially the supervisors from Chalmers (because SAAB did not have the resources to be available as much as the students needed). However, she believes some of the students would have made it without the university's support, and mentioned external mentors or incubators as possible support functions. Nevertheless, the likelihood of success, is probably higher with educational and university support, in her belief.

Stora Enso
As a project manager and an industry representative, Kauppinen felt he could provide with important knowledge, guidance, practical experience and *"open doors"* for the students. However, he concluded the main reason why the project failed, was because the product was not as good as it initially indicated. He believes improvements of the project would be to have a better introduction of people involved, and more resources assigned the product development.

4.1.5.3 Ownership model and contracting

Idea provider	Concerning ownership model and contracting
SAAB	• Require between 40% and 50% ownership stake • Not interested in a consolidating book-keeping
Stora Enso	• No insights

SAAB

Gustafsson mentioned SAAB received 40% ownership of ReVibe after negotiations, although Chalmers wanted them to have a smaller share. However, she argued they would prefer between 40% and 50 % ownership and this was important for them. The reason for not wanting more than 50%, she argued is due to the rules of accounting (SAAB does not want to consolidate book-keeping between their portfolio ventures and SAAB, which they would require with more than 50% equity).

4.1.5.4 Matching SSE profile with idea

Idea provider	Concerning matching SSE profile with idea
SAAB	• Prefers to influence the matching
Stora Enso	• No insights

SAAB

SAAB were not able to have any criteria on which students they would prefer to run their ideas since the matching of idea-student was done by the program management at Chalmers. However, Gustafsson expressed they wished they were permitted to choose students.

4.1.5.5 The characteristics of the idea

Idea provider	Concerning matching SSE profile with idea
SAAB	• Suitable ideas are those with bad or insufficient data • Quite early stage ideas • Outside core business • Ideas should have a technical USP
Stora Enso	• Suitable ideas are those with insufficient decision material

SAAB

Gustafsson believes suitable ideas are the ones SAAB simply do not know if they are worth to invest in, and would like to test for a low cost. Regarding which state the idea should be in, Gustafsson prefers quite early-stage, due to if they were further developed SAAB could attract more experienced entrepreneurs to drive them. It is also easier to get younger and inexperienced people to take on early-stage ideas. Finally, she believes with no doubt, the ideas should have a clear technical unique selling point.

Stora Enso
Kauppinen believes suitable ideas for this kind of collaboration are ideas with insufficient decision material, for instance where Stora Enso needs help to understand how consumers are behaving and want to get a marketing perspective.

4.1.6 Idea inventor perspective

This section presents the empirical findings from the idea inventor, not to be confused with idea provider. The idea inventor is the individual person who invented the technology which was given away to the SSE.

4.1.6.1 Motives

Idea provider	Concerning motives
Cederwall	• Lack of time to drive an idea • Interested to be involved in some extent • Strive to see ideas be realized and taken into the market • Aim to stimulate innovation (part of life style) • Ownership shares was not a main incentive

In the perspective of the idea provider, Cederwall believes the reason to give the patent to students is because SAAB considered the Chalmers collaboration (i.e. to give it to eager young students) as one of the most successful channels for commercializing the technology. Further, he mentioned SAAB has a policy to keep a close collaboration with the university.

4.1.6.2 Resources and costs

Idea provider	Concerning resources and costs
Cederwall	• Provide the students with technical competence and support is required • Active inventor strengthen the trust for potential investors • Clear structure and alignment from the beginning is crucial • Students mainly provided with business development • SAAB benefit the venture with its brand and industry expertise • Students are flexible • Students had use of the parallel education

Cederwall believes the brand recognition of SAAB helps the SSE-based company ReVibe

because it scares away competitors aiming for patent intrusion. Further, SAAB contributes with experience from the industry and ReVibe has at several times have had use of lawyers from SAAB. Cederwall is still working with ReVibe one day a week (this day he has a day off from his regular work at SAAB) and is present during board meetings. Cederwall stated he is pleased with this structure. Without the students, Cederwall believes the patent would just have been unused for a long time. With the help of the students, they could enter the market quite fast, which gave them the first mover advantage.

Further, , in his opinion, the most important competence for the students to possess is to be able to communicate and adopt new knowledge. Also, Cederwall mentioned entrepreneurs need to be flexible (which he believes is one of the advantages with students compared to someone who has worked in the industry for a long time). He considered the students could take advantage of the parallel education, as well as they did not possess all the competence required in the beginning of the project.

4.1.6.3 Ownership model and contracting

Idea provider	Concerning ownership model and contracting
Cederwall	• Got equity in the new venture • The inventor equity gives trust for a potential investor

Cederwall believes SAAB, as the biggest owner of ReVibe, has contributed with their name in the branding of the product.

4.1.6.4 Matching the SSE profile with idea

Idea provider	Concerning matching the SSE profile with idea
Cederwall	• Students should complement one another • Barrier to overcome is to find a team able to work closely for a long time • The students having some technical experience is crucial

Cederwall believes some technical experience from the students is required because they need to be able to understand some of the *"technical language"*.

4.1.6.5 The characteristics of the idea

Idea provider	Concerning the characteristics of the idea
Cederwall	• The stage of the idea and timing is crucial • The patent had a proof of concept demonstrator when handing it over to the students (which facilitated) • Helps to have a patent when communicating with potential investors

4.1.7 Incubator perspective

This section presents the empirical findings from one incubator's perspective which is experienced in applyiong SSEs, structured from the five identified themes.

4.1.7.1 Motives

Idea provider	Concerning motives
Demola	• Stimulate innovation • Profit-driven • Facilitator between university and industry

Eskola describes Demola as a company with the ambition to stimulate innovation and how it brings the society forward, by acting as a facilitator between university-industry collaborations. However, as Demola is a profit-driven organization, they also have financial targets.

According to Eskola, there are several successful examples of new ventures originating from the Demola platform, as a result of the collaboration between students and corporations. Regarding the companies motives, he experiences participating companies measure the success of projects through ROI or whether or not the project continues internally.

4.1.7.2 Resources and costs

Idea provider	Concerning resources and costs
Demola	• Provide with matching between students and company • Students use the incubators elaborated project process • Participating companies required to provide support

Demola offers an elaborated process for the students to follow in the projects, as well as act as a facilitator when constructing the student teams. Except for the fee the participating companies pay, the companies are requested to provide one to two employees to invest their time in the project at least one day a week.

4.1.7.3 Ownership model and contracting

Idea provider	Concerning ownership and contracting
Demola	• New IP during project belongs to students • IP brought in to project protected for the company • Negotiation between the students and company if a venture is created

If the partner company would like to utilize its new IP, they can then license it from the students. If the project leads to a spin-off, by default, the students can utilize the IP they have created during or after the project, but not the company's background information. In some cases, the company might want to give the students rights to utilize some background information afterward, which is then agreed separately. Further, Eskola emphasizes how companies seldom reveal any of their core technology IP.

4.1.7.4 Matching the SSE profile with idea

Idea provider	Concerning matching the SSE profile with idea
Demola	• Students apply for ideas • Important for students to be included in the matching of ideas • Companies not guaranteed specific student competence • Looking for students with multidisciplinary backgrounds

At Demola, students interested in joining a project can apply online to specific projects (similar to a job application), which Eskola believes is important because students will have high intrinsic motivation. The Demola crew then performs a screening process, in which the main focus is on students' passion, interest and intrinsic motivation. However, Demola also look for students who would like to get in contact with professionals, and about 15% of participating students get offered a job after a project. In their experience, there is no correlation between academic results and becoming a good entrepreneur. The companies are allowed to make a wish list of the attributes and background of the students for their project and list this in their case advertisement, but no guarantees can be done. Demola has experimented with other forms where students were assigned to projects, instead of applying

for a project on their own, where the result was a big failure, according to Eskola.

4.1.7.5 The characteristics of the idea

Idea provider	Concerning matching the SSE profile with idea
Demola	• Projects should have a level of uncertainty • No requirement of technical novelty • Technical ideas turn out best

Eskola explained a high technical novelty of the project is not a requirement for Demola, however, he emphasizes projects from technological companies usually turn out the best.

4.1.8 Summary of potential value exchanges between stakeholders

Based on the different perspectives on the phenomenon of SSE from interviewees with experience of Student Surrogate Entrepreneurship, the authors identified potential value exchanges between stakeholders on the assumption they take part in a collaboration including SSEs (presented in Figure 4.1).

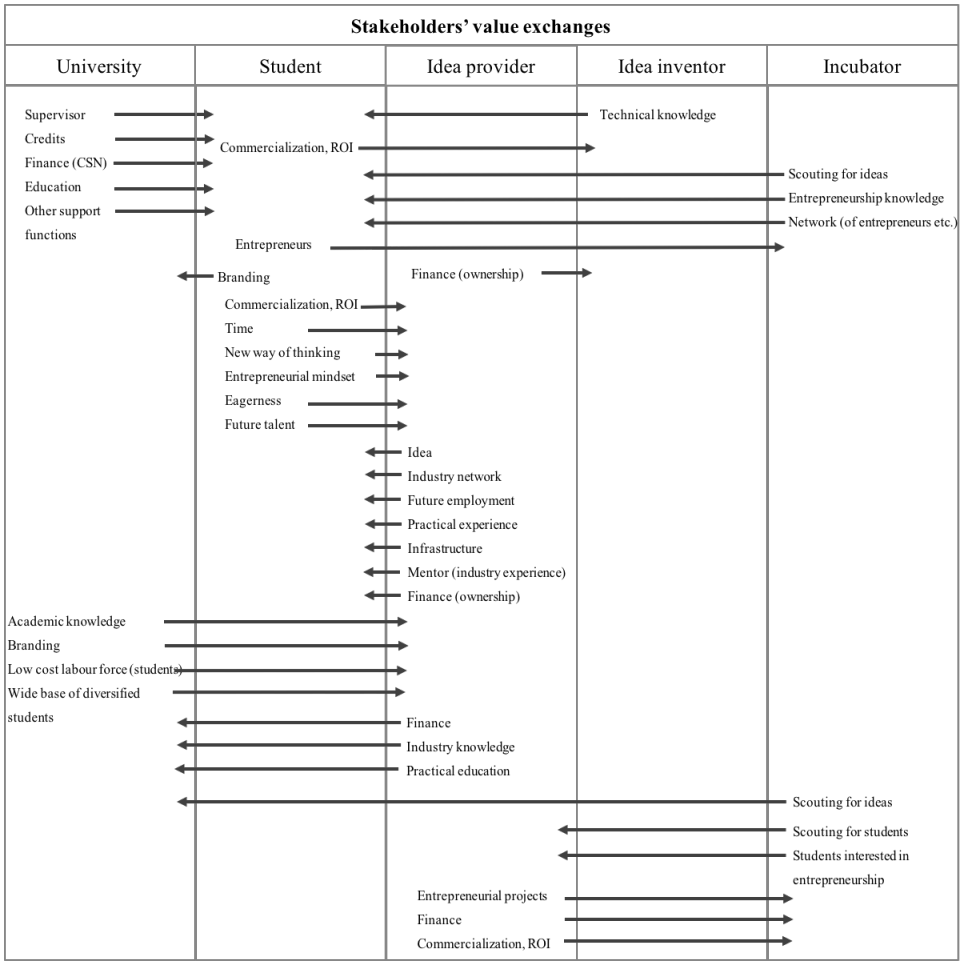

Figure 4.3: Stakeholders potential value exchanges from applying SSEs (Created by the authors)

4.1.9 Summary of stakeholders' motives

The identified motives mentioned by interviewees with experience of Student Surrogate Entrepreneurship are summarized in the following groups:

- University-industry collaboration
- Financial winning

- Practical learning journey
- Commercialization of ideas or technology
- Branding
- Gain resources and competences
- Stimulate innovation within innovation ecosystem

University-industry collaboration summarizes the following statements; *"bridge gap between university research and commercial reality", "collaborate with industry", "part of the company policy to support university and student activities", "policy to keep a close collaboration with the university", "cooperation with universities" and "facilitator between university-industry collaboration"*

Financial winning includes the mentioning of *"want their invested money back", "get a Return on Investment"* and *"financial targets"*.

Practical learning journey summarizes the mentioning of *"learning journey"*, *"gain experience of entrepreneurship"*, *"form engineers who are willing to commercialize technologies"*, *"use their academic knowledge in a practical context"*, *"provide the students with an education"*, *"practical experience"*, *"educating students"*, *"practical experience"* and *"preparing for the real world"*.

Commercialization of ideas/technology refers to *"create a commercialization funnel"*, *"incubator for technology"*, *"get a way to test their technology"*, *"increase the degree of commercialization"*, *"bringing university IP to the market"*, *"get the chance to test it"*, *"test if the market could be ready for the innovation"*, *"create sustainable and scalable innovation models"* and *"strive to see ideas be realized"*.

Branding includes the mentioning of *"good reputation"*, *"brand the company to students"* and *"corporate branding"*.

Gain resources and competences summarizes the mentioning of *"lack of entrepreneurial competences"*, *"low cost-way to explore new paths of innovation"*, *"the inventor is often very busy with other tasks"*, *"do not know how to take ideas to the market"*, *"scientists were more interested in researching than commercializing"*, *"a way of trying out an idea at a low cost"*, *"considered students as excited and willing to put a lot of time and energy"*, *"to perform the testing at low cost"*, *"students provide a great match to the lack of innovation-drivers"*, *"interested in trying the role of an entrepreneur, but do not have ideas"*, *"wanted a new way*

of thinking", *"did not have the time to drive and commercialize an idea"* and *"cheap labour force"*.

Stimulate innovation within innovation ecosystem includes the following statements; *"push innovation"*, *"open to connect with people who want to be entrepreneurial"*, *"exchange of innovation"* and *"stimulate innovation to bring the society forward"*.

The authors summarized the identified groups of motives divided on which stakeholder has mentioned the specific motive, or another interviewee mentioned it as a motive for the stakeholder, in a table:

Table 4.2: Motives to collaborate through SSEs for different stakeholders (Created by the authors)

Motive	University	Student	Idea provider (company)	Idea inventor	Incubator
University-industry collaboration	X		X		X
Financial winning			X		X
Practical learning journey	X	X			
Commercialization of ideas/technology	X		X	X	X
Branding opportunity	X		X		
Gain resources and competences		X	X	X	
Stimulate innovation within innovation ecosystem	X		X	X	X

A mark in the matrix implies the motive is a mentioned motive for the stakeholder to enter a collaboration including SSEs.

4.2 Findings from Case Study

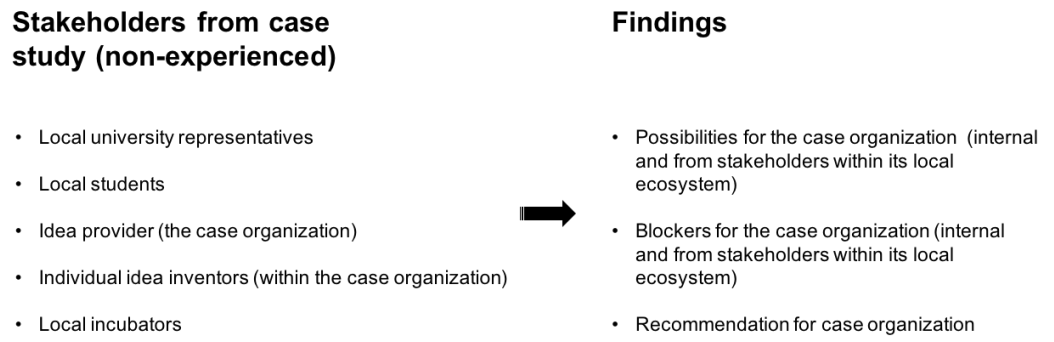

Figure 4.4: Structure of findings from the case organization and its local ecosystem (Created by the authors)

The case study has the purpose of building a solution to apply SSEs for the case organization. This chapter provides the findings from the case study, hence interviews with different stakeholders from the case organization and its local ecosystem, which the study investigate in order to find specific opportunities and challenges for the case organization to apply SSEs on internal ideas. The interviewees in this chapter lack experience of the phenomenon of Student Surrogate Entrepreneurship.

4.2.1 Empirical settings for case study

In order to conduct the case study and provide with a recommendation to the case organization, which is a non-experienced in the area of Student Surrogate Entrepreneurship, on how to apply SSEs on their internal ideas, a case study design described in chapter 2.2.3 has been adapted. This subsection presents relevant background information of the case organization, which is considered important as it affects the discussion and conclusion of the case study.

The case organization is a global high-technology company with more than 100 000 employees worldwide, and is active across several technology areas, ranging from electronics to entertainment. R&D activities and innovation have been a prioritized subject for the case organization in recent and the organization has the ambition to improve and develop further

within these areas.

The case organization currently has a systematic approach for promoting and nurturing innovative ideas within the organization, which is referred to as *The Innovation Journey*. The first step of the innovation journey involves the submitting of ideas from employees to the *idea inbox*, which is open for all employees. When submitting an idea in the inbox, the inventor can add the title *driver needed*, which indicates the inventor do not want to drive the idea forward and wishes someone else do do that. In addition, employees can sign up to be drivers in the system as well. However, the case organization currently lack drivers to commercialize ideas.

Further, the case organization runs an accelerator for start ups, where both internal and external start ups are invited to take part. A more detailed description of the case organization's innovation activities can be found in Appendix A.

4.2.2 Introductions to interviewees

Interviewees from the case organization and its local ecosystem derive from the same stakeholders as the interviewees from existing solutions of applying SSEs; university, students, idea provider, idea inventor and incubator.

Table 4.3: Table of interviewees connected to category (Created by the authors)

Name	Category	Name of organization	Interview type
Lottie Norrsén	University	Lund University (SKJ)	Qualitative in-depth interview
Charlotta Johnsson	University	Lund University (LTH)	Qualitative in-depth interview
Several people	Idea provider	Case organization	Qualitative in-depth interview
Several people	Idea inventor	Case organization	Qualitative in-depth interview
Several people	Student	Lund University	Quantitative questionnaire
Sebastian Ekstam	Incubator	Drivhuset	Qualitative in-depth interview
Moa Persdotter	Incubator	VentureLab	Qualitative in-depth interview

Lottie Norrsén is the director for external relations at Sten K. Johnson Centre for Entrepreneurship, part of Lund University School of Economics and Management. Norrsén was interviewed in order to understand the possibilities and blockers from the local university perspective of implementing a collaboration through SSEs (e.g. through a course or a program at the university).

Charlotta Johnsson is one of the vice principals at Lund Technical University, LTH, respon-

sible for the area of partnership and innovation. She was interviewed with the objective to understand the possibilities blockers from the local university perspective of implementing a collaboration through SSEs.

Sebastian Ekstam, is the CEO and business developer of Drivhuset, which is an incubator and innovation center for students at Malmö University. The interview with Ekstam aimed to investigate why they, as a non-profit incubator, want students to collaborate with industry within innovation and entrepreneurship. Another objective with the interview was to investigate how an incubator similar to Drivhuset could be involved if the case organization apply SSE.

Moa Persdotter, the executive director at the Lund University incubator VentureLab, was interviewed with the objective to investigate why or how a non-profit incubator could be involved in a collaboration with SSEs.

As Table 4.3 shows, several people from the case organization were interviewed. In total eight people from different departments or with different roles within the case organization were interviewed and are divided into the following categories:

- Innovation managers - *3 persons*
- Legal department - *1 person*
- Human resources department - *1 person*
- Patent department - *1 person*
- Idea inventors - *2 persons*

The idea inventors are representing employees who have submitted their own ideas in the organization's idea inbox, but do not want to drive them. Further, the interviewees from the case organization are not mentioned by name in this study. Instead, they are referred to as the part of the organization they belong to.

4.2.3 Case organization perspective

4.2.3.1 Innovation manager perspective

Three managers, here categorized as innovation managers since they are responsible for driving the innovation and development forward, from the case organization were interviewed.

The findings include their perspective and driving forces behind the organization's innovation system and its idea inbox, as well as what they wish to obtain with their structured innovation work. Further, their perspective on collaboration with universities and students are presented and finally their input on potential implementation of SSEs on internal ideas.

The organization's innovation system
The innovation managers concluded the main objective with the organization's innovation system (in which employees can work with their own ideas) is to develop business, both the core business and new businesses. Because the organization operate in a highly technical industry, innovation is required to stay competitive and thus differentiating activities must be deployed. Further, they were unanimous about how the current innovation system gives more benefits than only an opportunity to create new business. For instance, by creating an opportunity for employees to get involved and perform tasks different from their regular tasks, it stimulates personal development, provides an opportunity for employees to acquire new knowledge and enhance their working environment. Finally, the innovation managers also considered the innovation activities to serve as a marketing tool, by communicating how the case organization is an innovative place to work where everyone can help and contribute in the organization, they can attract talented personnel. However, it seems to be a barrier to motivate marketing, talent retention and educational as a purpose of the innovation system for the top management. Probably due to no monetarily profits can be derived directly.

One of the challenges mentioned with the idea inbox (in which employees can submit ideas and employees who want to drive ideas can sign up as a driver, see Appendix A), is to decide which ideas to go forward with. The innovation managers claimed ROI has not been the outcome of ideas from the inbox yet. Some of the managers also believe the potential of the ideas in the inbox are quite low, even if they had a driver, mainly because of low technical novelty, which could be a reason to why it is harder to find a driver for these more conceptual ideas. However, the managers consider the probability of having a great idea initially is very low and iteration of the ideas are required. Additionally, managers do not have the budget to let everyone who wants, to work with an idea. However, according to the managers, there are not enough entrepreneurs inside the organization and people tend to work within big corporations because they wish to work within a big organization. People willing to be a part of a start up should be seen as an exception within a big corporation, even though there are some people with an innovative mindset, although the interviewees clarify an intrapreneur is not the same as an entrepreneur.

The managers concluded, the reason for ideas to be unexplored is mainly due to one of the

following reasons; (1) the case organization do not have time to explore them, (2) they are patents used to block others or (3) they protect the case organization's patents or . Regarding the first reason, there is no system to handle this today. Nevertheless, one barrier for big corporations is they tend to not see the potential in small ideas and are not willing to invest in them and develop them further

Collaboration with universities and students
Regarding engaging with universities and students, the case organization wish to obtain knowledge and expertise, new perspective and energy, and also talent retention. Further, the managers mentioned this as a way to give back to the ecosystem (which is the reason the organization is located in the region), to strengthen the whole region and eventually benefits the organization. However, the interviewees emphasize the organization need to be even more open for collaboration. Finally, the managers conclude the university has been and still is, a very rewarding collaborative partner. The current touch points with students are mainly R%D projects, master thesis, internships or summer jobs, part-time jobs and providing students with small projects within courses.

Potential implementation of SSEs
In order to implement a collaboration through SSE, the managers believe a critical success factor is to have buy-in from the top management. A way to make this work in the case organization would be to prove how a concept works in small scale, according to the managers. However, they consider the phenomenon of letting a student drive an internal idea is interesting and one manager stated *"By that, we can do what we are good at, and let someone else take the risk of trying to commercialize it"*.

The obvious barrier for implementing a new model for SSEs, according to the managers, is the size of the organization, which is related to factors that may hinder innovation at big corporations such as policies, structures and mindset. Also, students with less experience, do not usually have the right *"tools"* and which would mean the organization have to provide tools and support for the students. However, one manager believes students have a great positive advantage of *"not seeing the problem"*, and with young and fresh eyes they can just keep on working. Finally, it seems to be in their interest, if they applied SSEs, to be involved in the recruitment process of who gets to drive an idea in order to secure the right person ends up in the right place.

Further, one manager concluded, the university and the case organization actually have distinct processes for innovation and thus argued for several possible ways to structure

implementation of SSEs. The interviewee mentioned it could either be done by tapping into the university process or internally at the organization without using the university platform, and sees advantages and disadvantages with the different setups. Another manager was clear to make a difference of a driver who is not the inventor, between internal drivers compared to external drivers. The innovation manager had concerns about who should decide if the idea or patent is never going to be useful within the company and addressed the problem if the company has decided to give away the idea externally and later realize they need it. This problem is particularly a concern for the case organization, due to operating in a large amount of different industries, i.e. it is hard to decide what is not core business.

4.2.3.2 Idea inventor perspective

One mentioned objective by the idea inventors for submit ideas in the organization's idea inbox is because he or she felt obligated after taking part in ideation session. Another motive was because the inventor believes the idea has the potential of creating a business around it. One of the internal inventors mentioned the driving force is to make sure no good ideas vanish. The inventor stated *"Maybe there is a technology that could change things for the better that we can't miss?"*, hence for this person personally there was an overall objective of improving the region and the world around as well.

Further, an important issue, which the interviewees were asked about is, why someone would submit an idea if he or she does not have any intentions of driving it him- or herself. Both the interviewed inventors agreed upon the major reason for not taking on the idea themselves is lack of time. Further, in some cases, the inventors said they did not believe in their own idea and how the quality of the idea is to low. Although lack of time is mentioned as the major reason for not driving ideas, the inventors stated how allocating a few hours a week of their current working hours would be fine. In this way the idea inventors could ensure the ideas' commercial value would get tested.

The interviewees also seem to agree if someone else would take their invention or idea and turn it into a successful business, they would not mind. Instead, the inventors explained, they would enjoy if they were the one to plant the seed for a new venture. Further, one inventor mentioned, the more time and energy he/she had invested in the idea, the more emotionally attached he or she would be.

4.2.3.3 Patent department perspective

The case organization aims to create a specific number of patent each year in order to build a patent portfolio with the focus to create standardized patent. When interviewing one person within the case organization with insight for standardized patents, the interviewee stated how after being filed a patent sometimes no longer is relevant. It is then decided whether to release it or not by the patent department in the case organization. They check all filed standardized patent the organization possess by going through the database of all patents two times a year, and consult whether to keep them or not, due to a yearly fee to possess a patent except for the cost for filing it.

During the interview, the interviewee also claimed the standardized patent are complicated and hard to commercialize, and how *"they are more for defense play"* than something for *"regular people to understand"*. The interviewee mentioned the *"commercializable patent"* are the ones suitable for an entrepreneur to build a business upon. However, the number of commercializable patents within the organization is decreasing, and in the interviewee's opinion more conceptual ideas (which are not building upon patents) would be more suitable for a spin-off. The advantage of having a patent to build a business upon is how venture capitalists and investment angels value it, according to the interviewee.

4.2.3.4 Legal perspective

To give the legal perspective of the case organization, a senior employee of the case organization's legal department was interviewed.

According to the senior legal employee, there are different legal challenges of collaborating with students or a university, depending on how the setup and the framework of the collaboration is decided. When it comes to including patents and IP in a collaboration with students, one way could be to use either royalties or license out the technology. Some regulations could also be added in the contract to enhance the conditions for the success of a start up, by instance for the organization to not claim royalty until the new venture has reach a specific revenue. Another way to go, assuming the target is to create a new company, is by owning shares. Additional options mentioned by the interviewee is how students could acquire the technology personally. However, the interviewee considers this hard and quite unlikely. Further, the interviewee mentioned a way could be to *"sneak it out of the building"*, meaning to turn it into an open source asset.

The major concern regarding giving away ideas to externals, is to get the top management to agree, according to the interviewee. The political direction from headquarters have to be aligned in order to sanction an initiative of this kind. *"There is a lot of administration with owning 20% of a company",* explained the interviewee. The interviewee experiences it is difficult to be a passive owner in a start up, since the objective of the start up is to find new investors it requires decision making and active ownership to avoid dilution. From a legal perspective, it is much more manageable to create collaboration between internals and externals if there is no patent or IP involved. The reason being they would not have to involve the IPR department at the case organization and thus, the collaboration would be considered safer. However, the interviewee believes a collaboration of this type can lead to more stimulated engineers and promote innovation in the case organization.

4.2.3.5 HR perspective

In order to understand if there is an alignment between introducing SSE and the case organizations human resources-strategy, an interview was made with the head of Human Resources. The interviewee stated how the case organization aim to keep diversity in all forms, together with a strive for recruiting younger talents to drive innovation, in order to create a mix of younger- and more experienced perspectives. Unlike a few years prior, except for people with high technical skills they are now also looking for people who are entrepreneurial and people with marketing and sales skills. One reason for this is the quite new Start up Acceleration Program, an internally run incubator for both internal and external start ups. However, a change in strategy from top management (at the global head office) has influence in the change of direction. Additionally, the head of HR mentioned the case organization is required to cutting edge in order to survive as a high-tech company and thus, it is required to have *"the right people, for the right task"*.

Regarding the case organization's current touch points with students in the region, the interviewee claims they market themselves to young professionals through events, fairs, sponsoring student activities, etc. Nevertheless, the head of HR considers they could become better to market their *"innovation side"*. Further, the interviewee believes the top management of their global company understands the importance of collaboration with universities, which facilitates the collaborative work within the region.

4.2.4 University perspective

4.2.4.1 Lund School of Economics and Management

The current master's program
The master's program in entrepreneurship at Lund School of Economics and Management, consists of two tracks, *"Corporate Entrepreneurship and Innovation"* and *"Entrepreneurship: New Venture Creation"*. The venture creation track runs over two semesters, whereas the first semester consists of courses related to venture creation and in the second semester, the students get to work with their own idea. However, the program has experienced with letting the students work with external ideas from researchers, even though it has not been structured. Further, in the courses within the program, the ambition is to keep close contact with the industry and experienced professionals, which is done through practical projects in the courses.

The main purpose of the program is personal development and education in entrepreneurship and not to create companies, according to Norrsén. However, she would like to see more ventures come out of the program, which could improve the reputation and competitiveness of the program. Further, if a venture would bee created as a result of the program, Lund University would not claim an equity or ownership share, according to Norrsén.

University-industry collaboration
Norrsén believes the connection between industry and academia is very important, and the philosophy of the school is based on the belief students can not study to become an entrepreneur. According to Norrsén, the industry is generally positive towards collaboration with the university and most of the involved companies have interacted with students in some way during projects before. The students can offer a more holistic outside-in perspective, which the companies often claim they want to spend more time on. Norrsén claimed she often meets with companies expressing they have projects they do not have time to drive.

Compared to a few years prior the university seem to have become more open towards the industry, as the main objective of the education is to provide the students with relevant content

Regarding SSE
Norrsén believes SSEs could create a win-win situation for the academia, students and industry. Norrsén believes company ideas, with the purpose of venture creation, can be

applied within the master's program, even though there are challenges. By instance, the top management at the university have to be convinced.

In Norrsén's experience, students are often very attached to their own ideas and difficulties could arise in convincing students to take on someone else's idea. Further, a possible ownership stake is often questioned by the students. No matter if the students are taking on an idea from companies or scientists, they seem to expect a quite high ownership stake, according to Norrsén. There have been previous examples of contracts to regulate the conditions between students and idea providers, but they have been customized for different situations and depending on who the idea provider is. A problem with previous attempts to let students work with ideas from the research is the ideas have proven to have a long TTM, which often leads to students losing interest.

4.2.4.2 Lund Technical University

At LTH there is no specific master's program directly focused on entrepreneurship. However, LTH is interested to engage with the industry regarding innovation and entrepreneurship in various ways. Further, Johnsson believes there is a big interest among students to participate in more entrepreneurial activities. She believes LTH need to have more courses that allow the students to learn in a more open environment.

University-industry collaboration
Current collaborations with industry concern strategic partnerships, initiatives allowing the industry to rent university testing facilities and science and innovation talks performed by university researchers at companies in the region. Collaborations with the industry including students mostly take place in some courses, most often in project forms, or master theses. There is a lot of innovation performed at LTH, however, as they are a scientific institution, the purpose is not always to commercialize ideas or technology. Despite this, Johnsson believes the academia sometimes should be more business oriented when it comes to innovation, especially in order to have a greater understanding of the market. She also mentioned one of the main motives to engage with the industry is because a large amount of the LTH research budget originates from external sources.

Further, LTH assists and provides the industry with a lot of important research, implying why the industry is interested in engaging with LTH. LTH is very skilled in various areas the industry are highly interested in. Other motives for the industry to engage with LTH

concerns recruitment and how the industry wants to tap into the latest technology, as well as have input in what is taught in the programs.

Regarding SSE
Johnsson seems to be positive towards SSEs, and she believes it could be implemented both through a project or a course. She also mentioned a specific electable course at LTH called *"Engineering Training Course"*, which could be used for this purpose, as it is a course engineering students can use to perform an internship during summer or the semester. Johnsson also mentioned how creating a master's program could be a great way of deploying SSE and educating students in technical entrepreneurship. However, she emphasizes, creating a new Master's program generally takes a very long time, up to four years.

The main concern, according to Johnsson, is what will happen after a course or a project ends where students have been driving company ideas. *"If the students are not graduating after a finished project, how do you continue the start up"* Johnsson questioned. Another concern is regarding companies taking advantage of the students, i.e. using them as consultants. She mentioned yhe main objective should still be education, and students should not run the risk of being used as consultants. Further, there might be difficulties regarding changing existing courses and introducing new ones, however it does not appear impossible. Lastly, in the case of applying SSEs in a course or program, LTH would not be able to guarantee student profiles to companies.

4.2.5 Student perspective

A quantitative questionnaire of students at Lund University was performed to clarify the potential interest and driving forces among students in the local ecosystem. The complete results of the questionnaire can be found in Appendix B.

In total 60 students at master level at Lund university answered a questionnaire regarding their interest in entrepreneurship and their input on different scenarios driving a company's internal idea. The questionnaire was sent out to approximately 300 students. Below the most important results of the questionnaire is presented.

Regarding entrepreneurship and venture creation

- It appears to be a clear interest in entrepreneurship among the asked students

- Almost 50% of the asked students, who either are neutral to or agree to have thought of starting a start up, experience barriers with not believing in their ideas or lacking ideas to create a start up around

Regarding driving a company's internal idea as a SSE

- More than 50% of the students claimed they would be willing to drive someone else's idea as their own
- The main objectives to take on a company ideas would be either to create a successful start up or to gain entrepreneurial experience
- The students highly value to be able to influence which idea to work with
- If given a choice, most students would prefer to act as a SSE through an internship or summer job
- If students would act as a SSE through an internship/summer job; salary is considered the most reasonable compensation
- If students would act as a SSE through an educational program; no compensation or an ownership stake is considered the most reasonable compensation
- If students would act as a SSE parallel to their studies; ownership stake are considered the most reasonable compensation

4.2.6 Incubator perspective

Objectives
Both Drivhuset and VentureLab aim to inspire for entrepreneurship and innovation, and to foster and encourage innovation in the region. They are also part of a big network around innovation, consisting of other incubators and innovation hubs, universities and companies. Both Drivhuset and VentureLab do not actively initiate contact with corporations in order to gain profit, since they already are financed by the university. The objective to collaborate with industry is to broaden the possibilities for students to work with or learn about entrepreneurship and innovation. Both Persdotter and Ekstam explained the incubators want to be a *"middle-hand"* between students and companies. The value for them to match

students and companies is to increase the number of ideas for students to work with as well as to attract more students, which hopefully has a positive effect on innovation within the region.

Industry collaboration

Regarding the value for companies to integrate with incubators, Persdotter believes it is the chance to meet driven students without spending much time on scouting for them. Ekstam believes the gathered value for companies to join case-solving activities organized by Drivhuset, has been to get valid input from another perspective. Students working on a company's idea, he also mentioned, is a low-cost way of testing ideas. Except for this, Ekstam mentioned employer branding as an motive for companies to collaborate with students through an incubator. However, according to Ekstam, this can sometimes be a conflict of interest between companies and Drivhuset, since they want as many ideas as possible to *"pop up"*, but students often get recruited by companies. Persdotter explained regarding collaboration with companies, VentureLab can not offer any guaranteed students with specific competence to corporations, they can only offer exposure and to be a channel through which they can reach out to students.

Regarding student interest

The two interviewees concluded the interest in innovation and entrepreneurship is big among students. However, Ekstam believes a barrier for students to not fulfill their entrepreneurial dreams is because they do not believe their business idea is unique enough to work with. According to Ekstam, students may not get that sensitive to the idea if they try on a company's idea. Further, Persdotter explained, even though most students who contact VentureLab want to start up their own business, there are students who come to them without ideas looking for other start ups in which they could work.

Chapter 5

Analysis and Discussion

In this chapter, the empirical findings and the literature review are analyzed and discussed in order to reason regarding the research question. Firstly, the authors argue for the potential stakeholders when implementing a collaboration through SSEs, which lay the foundation for the analysis and further discussion. Secondly, an analysis of the findings from the empirical data of existing solutions of applying SSEs, based on the five identified themes; motives, resources and costs, ownership, matching the SSE profile with an idea and the characteristics of the idea, is conducted. The authors discuss and analyze challenges and opportunities when applying SSEs as well as models for applying SSEs and their advantages and disadvantages, with regards to the potential value exchanges between the stakeholders. Thirdly, the result of the empirical findings of existing solutions of applying SSEs is analyzed and discussed in context with the empirical findings of the case organization and its local ecosystem, in order to form a recommendation to the case organization on how to apply SSEs on internal ideas.

5.1 Analysis of Existing Solutions of Applying SSEs

5.1.1 Stakeholders

Before discussing and analyzing stakeholders' perspectives of Student Surrogate Entrepreneurship, it should be established what or who qualifies as a stakeholder. It is implied by the

empirical study, the university is a potential stakeholder, however, the university does not only represent one perspective. Even though a student is seemingly part of the university, the authors argue for the individual student to be considered a separate stakeholder when applying SSEs. A university incubator is also part of the university, although it could be argued, partly because they work with their own budget, the incubator represents a differentiated perspective. Further, the same reasoning goes for the company, as the overall mission of the company does not have to be representative for the idea inventor.

The concept of Surrogate Entrepreneurship itself suggests there are at least two obvious stakeholders. As Radosevich suggested in 1995, when commercialization is not performed by the inventor, the main stakeholders are the surrogate and the idea provider. Because this report is investigating the use of the students acting as the surrogate, it is logical to assume two obvious stakeholders in this scenario are the student and the idea provider. Historically, the literature presents the idea provider as someone who originates from a research institution. Radosevich seems to paint the picture of the idea provider as someone with exceptional technical expertise, but with low capability of commercialize and harvest the potential value of the technical novelty. Lundqvist is the first to suggest students also could serve as a Surrogate Entrepreneur and thereby two other stakeholders are introduced; the university and the student.

The empirical study of existing solutions, previously or currently applying SSEs, implies most of the existing SSEs seem to derive from universities. The academic arena therefore proved to be a natural starting point of further empirical investigation to identify possible stakeholders. Most of the reviewed universities showed similar indicators of their main stakeholders. The ideas originate in most cases from companies or research and in some cases there seem to be a specific inventor behind the idea and sometimes not. Regarding the idea inventors, the universities seem to still in some content recruit ideas from individual researchers and scientists. However, the empirical studies indicate a shift among the universities. According to Lundqvist, Chalmers went from researchers as their only idea provider, to open up for the industry, turning the idea inventor away from the scientific world and towards the industry.

From the Chalmers model it is suggested, mainly through the ownership model, not only the students and the idea provider are the main stakeholders, but also the university incubator. Hence, the empirical study proposes an intermediary could be a stakeholder. Similarly, at other universities, such as Tromsö, a TTO is used as an intermediary. Further, the empirical findings through the Demola model also demonstrate a non-university incubator can create

a functioning platform for collaboration between students and companies, where the student serves as a SSE.

Further, the analysis and discussion is based on the following potential stakeholders: (1) university, (2) students, (3) idea provider (company), (4) idea inventor and (5) incubator.

5.1.2 Motives

The empirical study of existing solutions of applying SSEs investigated the different stakeholders' motives to be a part of a collaboration including SSEs (see 4.1.9 Summary of stakeholders' motives), and further, a discussion of alignment and contradictions among them is conducted.

5.1.2.1 Alignment of motives between stakeholders

The authors summarized the identified groups of motives for different stakeholders in Table 4.2, with the aim to locate alignments and contradictions between different stakeholders. In order to create a win-win situation for the stakeholders involved, the authors make the assumption motives have to be somewhat aligned. However, the motives that required to be aligned depends on how the collaboration on SSEs is structured, due to different setups may require different stakeholders' involvement and result in different value exchanges between stakeholders (this is further discussed in 5.1.7 Models for applying SSEs on company ideas).

The two motives which most stakeholders wish to obtain, are:

- Commercialization of ideas or technology - *mentioned by 4 of 5 stakeholders*
- Stimulate innovation within innovation ecosystem - *mentioned by 4 of 5 stakeholders*

Commercialization of ideas or technology is mentioned as an objective with SSEs by all stakeholders except for the students, which is a stakeholder regardless of how the setup of SSEs is structured. However, the authors argue, even though commercialization is not mentioned as a motive by the students, it should be in their interest as well if they want to be an SSE, due to it is the original purpose of a Surrogate Entrepreneur as mentioned as an objective of the phenomenon when introduced by Radosevich. Hence, the objective of commercialization is argued to be somewhat supported by all potential stakeholders.

Likewise, stimulation of innovation within the innovation ecosystem is something all stakeholders except for the students mentioned they wish to obtain through SSEs. However, even though it does not seem to be a main motive for the students, the authors argue for an introduction of SSEs (whereof the students are enablers) has a likelihood of stimulating innovation within an innovation ecosystem, regardless if it is the student's main objective or not. The argument is enforced by the theoretical framework regarding the benefits of open innovation and inter-organizational collaborations. Further, the empirical study has not proven any signs of the other stakeholders' aim for stimulation of innovation to be a blocker for students that have acted as SSEs. Thus, to introduce a Student Surrogate Entrepreneurship collaboration with the aim to stimulate innovation within a region does not seem to be a blocker for any of the potential stakeholders.

Hence, it could be argued for these motives to be in focus if the collaboration through SSE includes all five potential stakeholders in order to achieve alignment between them. However, not all stakeholders are included in the collaboration depending on how the SSE is applied, which should be taken into account when analyzing what motives to align (this is further analyzed in 5.1.7 Models for applying SSEs on company ideas).

Further, the authors argue for the motives aligned between the student and the idea provider to be of high importance, because those are the stakeholders always included regardless of which model, when applying SSEs on company ideas. From Table 4.2, the motive which seems to be in common, and thus aligned, for both the students and the idea provider is:

- Gain resources and competences

The analysis and discussion regarding alignment of this motive between the two stakeholders are further discussed in 5.1.2.2 Contradictions between motives and 5.1.3 Resources and cost.

5.1.2.2 Contradictions between motives

The motives only a few of the potential stakeholders wish to obtain through applying SSEs and therefore could be a blocker for collaboration, are the following:

- Practical learning journey - *mentioned by 2 of 5 stakeholders*
- Financial winning - *mentioned by 2 of 5 stakeholders*
- Branding opportunity - *mentioned by 2 of 5 stakeholders*

The practical learning journey is mentioned as an objective for each of the interviewed universities to structure a collaboration through SSEs as well as it is mentioned by all experienced students as a reason for becoming an SSE. However, neither the idea provider, the idea inventor nor the incubator mentioned the learning part as something they wish to obtain. Gustafsson even mentioned, from the perspective of an idea provider, the students' need for coaching is something she experienced as a blocker. Hence, it gives an indication the collaboration needs to contribute with something additional except for education (which seems to benefit mainly the university and the students) to provide enough motives for other stakeholders, such as the idea provider.

Both financial winning and branding are mentioned, within the empirical study, as potential motives for idea providers to apply SSEs, mainly by obtaining students for a low cost and get the chance for both future ROI and corporate branding. Nevertheless, Table 4.2 indicates these motives are not that well supported by the other stakeholders (including the student, which is a mandatory stakeholder) and could be argued for the companies to avoid as main motives, or at least to be compensated by other values the students wish to obtain (such as practical learning or to gain resources from the company).

Furthermore, it should be noticed the empirical study identified *"branding opportunity"*, *"financial winning"* and *"gain resources and competences"* may refer differently for different stakeholders. Hence, they could be sources for contradictions. By instance, financial winning for a company, by applying SSEs, does not necessarily mean it fulfills financial winning for an incubator part of the collaboration (e.g. depending on ownership model for potential incorporation). When it comes to the contradictions of a branding opportunity, Andersen mentioned companies with corporate branding as the main purpose to join a collaboration, could be in contradiction to the purpose of the other stakeholders. Even though the university obviously cares about their branding opportunity, their main purpose is to brand their education, not the companies, whereas a conflict could arise.

In a similar way, the empirical study indicates gaining resources and competences does not imply the same for different stakeholders, and may cause a contradiction, even though it is mentioned as a motive by the students and the idea provider and thus of importance. To gain resources seems to be a reason to the literature's first introduction of Surrogate Entrepreneurship, where the phenomenon is explained as a reaction to the inventor's difficulty of taking on the entrepreneurial role required to commercialize an idea or technology and seeks the competence externally. This vision seems to be agreed with the empiric, as Gustafsson described SAAB has engineers who provide innovations, although she does not

consider them entrepreneurial enough to succeed with commercializing, as well as they do not have the time. Hence, a lack of entrepreneurial competence and time within a company seems to be possible to fill through applying a SSE, by getting students, with a fresh mindset and other competences to work with an idea at low cost. Differently, from a student perspective, the empirical study implies gaining resources refers to obtaining an idea or technology to work with , especially for students who lack ideas, as well the resources connected to the infrastructure and network of a large company. Thus, the students and the company might refer differently when expressing the motive of gaining resources, and it may cause a blocker for collaboration. By instance, former Chalmers student Zamany, expressed SSEs risk not to be successful if the company only considers it an opportunity for *"free labor force"* and do not give something to the student in return because they are afraid to let go of control. Additionally, DTU has noticed some companies use the students only as a product development team or put the students on another internal project, which Andersen means undermines the purpose of the course and disappoints both the university and the students. The authors interpret the motive of gaining resources and competence can be aligned by a focus on an exchange of resources as a win-win situation rather than it only going in one direction (e.g. the company only taking advantage of the students) and thus the common motive between the student and idea provider can be aligned.

5.1.3 Resources and costs

The theory regarding university-industry collaboration on innovation suggests resources (monetary resources, time and other) to be crucial for the collaboration to exist, by creating an incentives system, as well as supporting infrastructure for collaboration.

Inventor support

The literature regarding Surrogate Entrepreneurship suggests the technical knowledge, which the inventor possesses, can be assured if the inventor can act as support. Thus, the main benefit of the inventor can be assured. Lundqvist states in his article, a Surrogate Entrepreneur should be seen as a complement rather than a replacement to the inventors in order to be successful, which he strengthened during the interview. Similar to Chalmers, DTU and Tromsö emphasize this perspective, and Utne even stated one of the reasons for the shut down of the program was because support from the scientists was too low, which constituted a blocker for students to fully understand the technologies. Former SSE Zamany further supports Utne's believes of lack of support from the inventor, or poorly technical documentation, to be one of the sources for failure. Finally, from an inventor perspective,

inventor support was mentioned as crucial for potential investors in a later stage.

Mentors for the students
All universities, as well as Demola, expressed they require a mentor or project leader from the idea provider, which also seems to be of importance for the idea provider. However, the authors discovered a contradiction from the idea provider perspective through Gustafsson and her comments regarding the need to be an active board member, due to younger people require support. Thus, the authors interpret an idea provider may not want to spend too much time coaching the students (which seems reasonable as SSEs are used partly under the assumption the company lack time).

Except for a mentor from the idea provider, the findings from existing solutions of applying SSEs prove universities support the students with a supervisor as well. However, this is not supported by the Demola-model of implementing SSEs. Thus, there is an identified difference in provided resources between the university-based models and the incubator based structure. However, a mentor outside the company seems to be of importance from the university perspective, the student perspective as well as from the idea provider perspective. Lundqvist declared Chalmers never had a student who has *"burned out",* and believes the reason is all the support provided by the university, which also students expressed as important. More interestingly though, is the idea provider considers this as a success factor as well. Gustafsson believes the success rate probably is higher with the support of Chalmers, although she also mentioned external mentors or incubators as a potential alternative as external support).

Resources and competence provided by the university
Further, all university cases of applying SSEs provide the student with other resources except for supervisors. The authors interpret by the findings of the empirical study for these resources, such as the universities' established network (e.g. lawyers), test facilities and education, to be of value for the students. The education was also expressed as a success factor for a collaboration through SSEs, by the idea provider as well as the idea inventor.

Resources and competence provided by the company
The students consider the resource provided from the company is the actual idea or technology as well as the infrastructure, experience and network of a company. Cederwall also mentioned the well-known company brand to be beneficial for the students and their new venture. The literature regarding corporate entrepreneurship considers market power, established linkages to key actors, access to capital markets and enablers to fast scale as benefits

of a large company, although it seems established large companies often struggle with creating an entrepreneurial environment (with rapid movement and becoming less bureaucratic), which appear easier for smaller companies. The culture, which entrepreneurship requires, is mentioned by the literature to be a hinder in larger companies due to risk aversion and fear of failure. In addition to this, the authors have discovered a potential blocker regarding resources from the idea provider, which is the unwillingness to let go of control. According to Zamany, one of the blockers she experienced was not having the full responsibility and power over all parts of the "venture". Demola havehad similar experiences from companies and Eskola stated it often hinders the creativity and possibilities to provide a solution to the project. Hence, the empirical study seems to be aligned regarding in order to become entrepreneurial, large established companies must overcome the cultural barrier. Additionally, the size of the firm seems to have an influence on their enablers for entrepreneurship.

Resources and competences provided by the students
The literature concludes the idea inventors have struggled over decades with the commercialization of technology, as well as large corporations struggle to create an entrepreneurial environment. Neither scientists nor employees seem often to not possess the required qualities to be entrepreneurs, which might be why they have turned outwards to find those. Lundqvist argues in his articles a SSE could benefit a company or idea inventor with business knowledge, flexible and more willing to take on uncertainty. Further, the article suggests a SEE can be a solution to the employees' lack of time. The literature seems to agree on the surrogate profile, concerning the capabilities, is supposed to be different and complementary of those of the inventor.

The empirical study indicates the resources and competence the students bring to the company are time and an eager, flexible approach, willingness to engage in early risky stages and to act under uncertainty as well as they possess time which employees do no often have. This seems to be aligned with the literature regarding Surrogate Entrepreneurship, and the authors argue for these to be the students' main strengths as entrepreneurs, which they believe should to be highlighted to potential idea providers. Additionally, as implied by the interviews with stakeholders with experience from SSEs, the students may provide as a source for future talent (i.e. new employees) for companies.

Resources and competence provided by the incubator
The discovered resources an incubator can provide for companies, as a part of a collaboration through SSEs, are scouting for ideas (as in the case of Chalmers and Demola) as well as a platform to scout for students, which the case of Demola demonstrates. Further, as

suggested by Gustafsson, an incubator could provide with an external mentor (outside the idea provider) and entrepreneurial knowledge. Additionally, within the Demola case the students are supported by their elaborated working process as well as Chalmers incubator support students within some crucial tasks within entrepreneurship, such as contracting.

Costs for applying SSEs
The empirical study identified idea providers in some cases (Demola and the HardTech entrepreneurship course at DTU) are required to pay a fee in order to get SSEs working on their idea. The authors argue for the participant fee to be reasonable for Demola, because it is a profit-driven incubator, however, they challenge the need for the fee within the DTU course. The fee at DTU seems to risk the participating companies gaining a too high bargain power (by signing off students rights to a possible new venture and sometimes only consider the student as a development team or having a hidden agenda), which may lead to disappointed students. Andersen expressed the fee the companies pay is a reason to why they can require all rights, and without this insurance it would be hard to recruit companies. However, the study has proved there are several successful cases through Chalmers, which indicates companies can be recruited without the insurance of having all rights to a future venture.

Further, depending on what the alternatives are to letting a SSE run an idea, the alternative cost for the company differs. Gustafsson and Cederwall mentioned the alternative cost for SAAB to allow students try commercializing the patent is low. However, in the case of SAAB as an idea provider, the authors interpret the challenge deciding whether the patent could be used within the core business or not (and by that, decide what alternatives they had to continue driving it) to be quite low, due to SAAB is not operating in a wide range of industries. To decide whether the idea lies within core business may not be quite that simple for all idea providers, depending on the type of company and what industries they serve. Thus, in order to decide the alternative cost, the idea provider needs to investigate the alternatives on what to do with the idea or technology thoroughly, which the authors argue to be more or less difficult depending on the company and its industry.

5.1.4 Ownership model and contracting

Radosevich refers to the Surrogate Entrepreneur as someone who acquires the rights to the technology, without really specifying exactly how this acquisition is performed. The literature regarding open innovation brings up license, royalty and divest as potential ways

of the company to diffuse out innovation from the company boundaries. Nonetheless, how the ownership of technology and a potential new venture is distributed seems to be a relevant matter in the literature. The traditional perspective of university-industry collaboration was often put in faith to licenses, but as the emerging trend seem to be a wider use and diffusion of students as the entrepreneur, the question the share of assets and potential winnings arise. Further, the literature mentions imprecise arrangements around IPR tend to hinder collaboration, although it seems crucial not to have to an excessive legal framework.

The empirical findings indicate how the question of ownership is both relevant and difficult to settle in a best practice manner. The universities proved to have different models concerning ownership. According to Lundqvist, the shared ownership at Chalmers has proved to be both sustainable and successful, implying a shared ownership model gives all parties motives to create a successful project; students are motivated to perform, as well as the investment pool leaves room for future actors to invest.

The DTU model does not require the companies to give away any equity in potential venture creation, which is in contradiction to what Chalmers states. Perhaps there are different environmental or cultural differences between Chalmers and DTU, such as different corporate traditions between Sweden and Denmark. Alternatively, the established program at Chalmers with their long history of several success cases may facilitate a stronger trust from companies. However, the study indicates students may be disappointed if not eligible for equity, which is an indicator for not giving the students any ownership stake at all might well be a sub-optimal solution.

Concerning companies and ownership, it seems as the companies are intrigued to maximize their ownership stake, without affecting their overall book-keeping. Arguably, this seems reasonable as one of the main motives of the idea provider is indicated to be financial winning. However, even though it at first sight seemed a large ownership for the company would be aligned with this, it should be considered the company might hinder other potential investors by owning a large stake.

From the previous discussion concerning motives, financial winning is not a main objective for the students. However, in contradiction, both the interviewed alumni from Chalmers program expressed they wished they would have had a greater impact on the negotiation of ownership. Börjesson expressed for the company to understand the alternative cost of not exposing the ideas to be crucial, suggesting it is in all involved stakeholders interest to not have a too big share. Further, the student perspective raised the potential barrier of

licensing out technology because it may hinder them to perform all crucial tasks. Thus, the authors argue for the question of ownership to be of importance for the students.

The idea inventor argues the inventor's involvements through an ownership share provides confidence for potential investors. However, this differs and depends a lot between the characteristics of the idea. It appears reasonable the role of an inventor as an equity holder is more relevant if the venture is based on a patent or a business idea of high technical novelty. In cases with a less technical idea the relevance of the inventor actually receiving any equity at all might be argued, as the majority part of the value creation is performed by other stakeholders.

Demola exhibits another functioning model, with everything brought in to a project belongs to the company, whilst all new IP created in a project belongs to the students. Hence, it suggest an alternative model in which the companies are consider more safe and are not required to give away shares of a new venture to other stakeholders.

The important question seems to be how to divide the ownership stakes between stakeholders in order to create a well-functioning collaboration. Whilst both literature and empirical findings indicate it is crucial for succeeding with SSEs, it is not unambiguous how the ownership should be divided. There are successful cases both where the ownership is shared and where it is completely owned by the idea provider. However, the empirical study shows indicators of all models to have at least one stakeholder not completely satisfied with their financial outcome.

5.1.5 Matching the SSE profile with idea

The literature seems to provide a complete picture of what attributes a SSE should have, however, it does not really address the concern of matching between students and ideas. Regarding the SSE profile and the team constellation, the universities were quite like-minded. They are looking for students with different backgrounds and aim for diversified teams. The universities have no requirements of entrepreneurial experience since this what the student should learn and possess at the end of the education. It seems like DTU stood out from the other universities, as they are more focused on students with a technical background, even though they in most cases try to assign at least one business student in every team.

Further, the universities seem to give the students some kind of limited influence on which

idea to be matched with (e.g. Chalmers use a wish list and DTU a questionnaire). However, this seem to be in contradiction with both students' and companies' preferences. Experienced students expressed the difficulty to truly adopt an idea as their own and feel passion, when they had not completely chose the idea. Börjesson also implied the team might have a greater impact on the end result than the actual idea. It seems like a risk of not succeeding in the venture creation if the students can not impact the choice, perhaps indicating even though the university model seems to be the most common model of implementing SSE currently, it might be sub-optimal.

Similarly, the idea providers from existing solutions of applying SSEs expressed they want to be involved in the screening process of which students to drive their project. However, it seems reasonable to argue it is difficult to achieve this through the university model. In the case of all students choosing the same company, there would still be both companies and student that would end up with a choice they did not wish for. Yet, the need to have a greater impact in the matching process should be highlighted, as both students and companies commented it.

The empirical findings indicate how the students' motivation is highly desirable, An interesting difference between Demola and the universities is the students have greater liberty to choose freely from projects. Of those who apply for projects, Demola still performs a screening process. Perhaps it is a recognition of the connection between choosing and intrinsic motivation with the students, suggesting if students are allowed to choose freely they are also more motivated if accepted.

5.1.6 The characteristics of the idea

The empirical study identified two main characteristics of the idea or technology of importance when letting an SSE run it; the technical novelty and the stage of the idea or technology. Except for the technical novelty and the stage of the idea, both the idea inventors as well as the university representatives mentioned the most suitable ideas for companies to apply SSEs on are the ones outside their core business in which the potential needs to be explored.

The level of technical novelty
The technical novelty seems to be considered a factor with major influence on the outcome of collaboration through SSEs, and the main concern of the interviewees is if the idea is a

patent or more conceptual. Interestingly, during the 20 years of running Chalmers School of Entrepreneurship, they have tried to apply SSEs on both ideas with a technical base and more conceptual ideas, and according to Lundqvist conceptual ideas have proven to be less successful. He believes one of the reason is conceptual ideas are not tangible enough to start work with. However, Lundqvist concluded another reason for Chalmers to only accept ideas with high technical novelty is because it is a technical university, which the authors believe can influence his opinion. Chalmers view on the importance of a high technical novelty is shared with DTU, however, the authors once again raise the concern about biases. Nevertheless, Andersen from DTU expressed, even though patents gives protection within the market, they have proven in most cases not to the foundation for the commercial benefits. Also Eskola from Demola emphasizes technical ideas usually turn out the best. Börjesson, from a student point of view, expressed advantages with a patent, although he believes more conceptual ideas' biggest benefit is higher flexibility. Finally, both the idea inventor and project manager from SAAB agreed on a patent comes with benefit (e.g. when communicating with investors) and according to Gustafsson, the ideas suitable for SSEs should have a clear technical Unique Selling Point, an USP.

Further, a more skeptical approach on ideas with high technical novelty was provided by Utne from Tromsö University and Guiliano from Georgia Tech, by indicating highly technical ideas often have a long TTM, which tend to result in students lose their motivation. Zamany, from a student perspective, is skeptical of the importance of a high technical novelty. In her opinion, success is all about the execution of the idea more than the idea itself. The university perspective also provides with insight of high technical novelty requires more support from the inventor, which have proven to sometimes be a barrier. The authors summarize the stakeholders with experienced from SSEs, argue it beneficial if the technical novelty is quite high, however, it does not seem to be required to involve a patent. However, the more technical the idea is, the more involvement appear to be required from the inventor, which needs to be taken into account. Additionally, a high technical novelty should not be determinant of a too long TTM, which may decrease the students' interests.

The stage of the idea

Another critical aspect of the Surrogate Entrepreneur model described in the literature, is the timing. It has been found by studies, the Surrogate Entrepreneurs have little impact on the actual venture development if he or she is not involved in the early stage. It is suggested students have a more willingness to engage in early risky stages than more experienced entrepreneurs. The idea provider's perspective also emphasizes this, by Gustafsson preferring early-stage ideas, due to if they were further developed SAAB could attract more experi-

enced entrepreneurs. Nevertheless, when interviewing Lundqvist, he described the timing as difficult. He has noticed, similar to Utne from Tromsö University, how too early stage ideas (i.e. long TTM) tend to result in a decreased interest from the students. Contrarily, too developed ideas seem to result in the students questioning what they can add. Thus, the stage of the idea seems to be a trade-off between if it is advanced enough to be interesting for the student and how long time they want to spend to reach the market. However, Gustafsson believes it has to be enough time to reach the market, without stressing the students.

Andersen, from DTU, provides with another perspective of the stage of the idea. Except for believing the maturity of the idea is crucial for the students to succeed, thus there is a trade-off between a late stage (i.e. the students have difficulties to contribute technologically) and too immature (i.e. making it hard because it is not concrete enough), he mentioned a blocker if it is too expensive for the students to test the idea.

5.1.7 Models for applying SSEs on company ideas

Based on the empirical findings, the authors argue for two distinct models for applying SSEs on internal company ideas, which are further discussed and analyzed. The models are based on two different setups, which enables different value exchanges between stakeholders (see Figure 4.1). The factor utilized for separating the two models is the platform used for the setup, i.e. who is the initiative taker for the implementing of SSEs and thus owns the process. However, within each model variations are possible. Further, the authors discuss potential value exchanges and possibilities with the different models, as well as potential barriers which may arise.

5.1.7.1 The university-platform model

The foundation of the university-platform model is SSEs are applied on company ideas as a part of the educational structure within the university. Thus, it creates a three-party liaison between the university, the student and the company. Identified from the empirical study, the following empirical cases are argued to fit into this model: the master's program within entrepreneurship at Chalmers University, the HardTech Entrepreneurship course at DTU, the Business Creation Entrepreneurship program at the University of Tromsö, and the TI:GER-program at Georgia Tech.

Value exchanges between stakeholders and possibilities within model
The university-platform model always enables all value exchanges, except for the ones from and to the incubator-area, in Figure 4.2, due to the incubator is not necessarily a stakeholder in this model (for instance there is no incubator involved in the DTU model). Firstly, the value exchanges between the students and the university in Figure 4.2 are realized. Hence, the university can through this model provide with academic knowledge (i.e education) and network to the students, act as a supervisor in terms of professors and as a safety net by financing the students through student funding (in Sweden handled by National Board of Student Aid, CSN, and often simply referred to as CSN) and in terms of credits. The practical learning journey seems to be of importance to the students (see 5.2.1 Motives). In return, the collaboration may be an opportunity for the university to get students to brand the university as a result of a well-functioned, quite unique venture creation education through SSEs. Thus, it is an opportunity for the university to get more students applying to the university.

Secondly, it opens up for a possibility to long term relationship between the university and the company by the university providing with updated academical knowledge in exchange for industry knowledge, which can contribute for both parts in different ways (except for the benefits of the SSE-collaboration). This collaboration opportunity is also enhanced as a motive for both the university and the idea provider. Further, due to the students are financed by the Swedish government (i.e through CSN) when taking credits at a university, it can be a way for the university to provide with low cost, or free, labor force to the companies. Further, accessing students through the university gives an opportunity for the company to get cross-functional teams, since the university has access to a wide base of different student backgrounds. It also enables branding for the company within the university for contributing with practical educational opportunities, which seems to be one of the reasons students apply for programs or courses including SSEs.

Variations within model
Some variation on how to structure the collaboration have been identified within the university-platform model. Firstly, there are variations on the ownership model of a possible new venture sprung out of the collaboration, which was discussed in 5.2.3. Ownership model. Secondly, the empirical cases applying SSEs through the university-platform imply the collaboration can take part through a course or a master's program at the university. Hence, the time period can differ.

Further variations within the model is a potential involvement of an incubator through the

university, such as Chalmers Ventures. Thus, it opens for a possibility for an incubator to scout for ideas and to contribute with entrepreneurial knowledge, as well as the incubator can fulfill its vision to stimulate innovation and potentially be financed. Hence, the model can include involvement of a fourth stakeholder, depending on the setup, which makes the model enable all links in Figure 4.1.

Barriers with model
Except for the value exchanges mentioned, the university-platform model may come with some barriers. For the company providing the idea to the SSE, this model requires involvement from another major actor; the university. It comes with extra bureaucracy, as mentioned by the literature to be a potential blocker for collaboration, since the company needs to adjust to the university framework and requirements, as well as potential changes of the setup can be slow (which is enhanced by the case of Tromsö). The authors therefore argue a setup of a new course or program may take time. Except for this, the empirical case of the model at Chalmers School of Entrepreneurship's involvement of Chalmers Ventures indicates the company could be obligated to agree on to give away shares of a new venture to another part, a university incubator, besides the SSE.

Further, a disadvantage for the company argued to be addressed into this model, which also the empirical study indicates, is to not be able to decide which students to drive their idea. This is connected to the company is obligated to follow the university's rules. Finally, the authors raise a concern regarding implementation of SSEs as part of a course within an education, which is not a final task of the education. If the students have to continue their education after taking on the role of an entrepreneur of a company's idea it may cause a blocker in terms of lack of time to continue driving it and start a venture after the course.

5.1.7.2 The intermediary-platform model

The second model identified by the empirical study as a way to structure a SSE collaboration, is based on companies and students meet at an independent arena of an incubator. Thus, the platform for collaborating through SSE is through an intermediary. From the empirical study, the case applying this model is Demola.

Value exchanges between stakeholders and possibilities within model
Similar to the university-platform model the intermediary-platform model realizes potential value exchanges between the idea inventor, the idea provider and the student-field in Figure

4.2. Secondly, the potential value exchanges between the incubator and the company as well as the students are possible. Hence, the incubator has the ability to act as a middle-hand between the company and the students and contribute as a *"matchmaker"* between the idea provided and a potential SSE. For the company, it can be a way to find driven students especially interested in entrepreneurship. An incubator can also provide students with a network and to support in specific tasks related to entrepreneurship. In return, the students are beneficial for the incubator because they are seen as people to drive entrepreneurship and innovation forward, which is their ambition. The companies can provide with both more opportunities for students to engage in and also finance the incubator.

The intermediary-platform model does not require the university to be involved, and therefore it can avoid some of the barriers with incorporating another major actor. The setup of the collaboration has the opportunity to be less structured compared to the university-platform model, due to some of the requirements from the university can be skipped, as in the case of Demola. The Demola case indicates the intermediary-platform model provides a chance for the companies to influence as well as the students to have some influence in the matching. Furthermore, the companies and the students seem to be able to avoid giving away shares of a potential venture (as a result of the collaboration) to a third party, e.g. a university incubator such as Chalmers Venture. However, the authors raise the question if the incubator providing the platform is profit-driven, the company can be obliged to give away shares or pay a fee, as in the case of Demola.

Further, the authors argue for incubators to be considered a place to go to for students interested in entrepreneurship, which can result in a natural way for driven students to become SSEs.

Variations within model
Due to there is only one identified case argued to fit into this model, it is hard to identify variations. Nevertheless, the empirical case of the Demola-model, implies the university in some cases can be involved through credits, even though the platform of the collaboration is the incubator. The involvement can open up for credits to the students and also financing, although it can result in requirements from the university.

Barriers with model
One potential barrier, due to the university is not part of the model, is the students are not provided with credits nor financed by CSN. Thus, the model eliminates the safety net by having the university involved. Also, the education which seems to be important for

the students in order to succeed, is not a natural part of this model, compared to the university-model. However, the authors argue for the incubator to be able to provide some kind of education as well, even though it might be less comprehensive. Hence, the motives for the students to drive a company's idea may need to be stronger when applying this model compared to the university-platform model due to less support is given. Therefore, the authors believe it may be harder for the potential value of low cost, or free, labor force for the idea provider (illustrated as a potential value exchange in Figure 4.1).

Further, the model does not fulfill the motive of a university-industry collaboration as mentioned as a motive by the idea provider and the authors argue for this model to not have the same source to a wide base of different student profiles as when including the university (which earlier has been mentioned as a potential value enabled through the university).

5.2 Analysis of Case Organization and its Local Ecosystem

This chapter analysis and discuss the empirical findings of the case organization and its innovation system in context with the result of previous empirical findings and the literature review. The aim is to find specific possibilities and blockers for the case organization to apply SSEs on internal ideas. Further, the identified sweet spots through this analysis will lay the foundation for the final recommendation regarding the case organization.

5.2.1 Opportunities to implement SSEs

5.2.1.1 Case organization

Innovation managers
The interviews with the innovation managers gave insights of the organization's structured way to showcase ideas, tag those that do not possess a driver, as well as a way to match them with employees who wish to drive one. The innovation managers also seem to agree on the literature's perspective of an idea inventor is not being equal to a driver. However, even though the case organization offer an opportunity for internals to drive ideas, one manager still believes there are non-explored ideas with potential and the organization lack

a system for what to do with those. Other managers expressed the majority of the ideas lack potential, however, they seem to believe ideas can seem to have low potential at first, but have to be iterated in order to show potential. Thus, the organization has an idea bank, in which many ideas are missing a driver from which ideas could be picked from to allow a student drive and by that, they could truly iterate early stage ideas and explore if they have potential or not.

Further, within the organization it seems to be an exception with an entrepreneurial mindset and skills, as well as there is no time to explore all internal ideas. Neither have the case organization the budget to let all employees work with an idea. This is well aligned with what the experienced idea providers expressed as resources and competence they lack and could obtain through students.

Regarding objectives with the structured innovation work within the organization, the case organization wish to brand the company as an innovative place to work where everybody can contribute and express ideas, and by that, attract talented personnel. Another identified motive with the innovation system expressed by the innovation managers was, not surprisingly, a way to develop both core and non-core businesses (and thus get financial winnings). To summarize, the values which seems to be of most importance for the case organization to obtain through the innovation system are; (1) financial winning, (2) stimulate innovation and (3) branding. All which are highly plausible to achieve through SSEs, which have been proven from existing cases of SSEs.

The innovation managers' view on the organization's objective to collaborate with universities and students appear to be the following; (1) give back to ecosystem (create a win-win situation), (2) talent retention (branding), (3) new knowledge and (4) new perspective and energy. Also, this seems to be enhanced with what could be fulfilled by collaborating through SSEs, as well as what experienced stakeholders have mentioned as motives (see Table 5.1). However, it should be noticed, for companies to recruit SSEs with the main objective to brand it to future talents have proven not to be successful. This has disappointed both students and the university. Further, what the authors also believe facilitates implementation of SSEs is the organization's positive history of university collaboration, as well as the managers seem to seek opportunities to combine different skills (e.g. to mix young talents with experienced people). The authors also consider it positive the innovation managers wish the organization to be even more open for collaboration.

Finally, the authors interpret the case organization is open for an opportunity to implement

SSEs through a different setup than the experienced cases imply (i.e. the university-platform model and the intermediary-platform model), since the platform of the case organization was mentioned as an opportunity by one innovation manager. Hence, a third model for applying SSEs on company ideas seems to be possible and is further discussed in 5.3.3. The internal-platform model for applying SSEs on company ideas.

HR

Similar to the innovation managers, the HR department enhances the perspective of the organization desires to brand an innovative side, search for diversity among employees, and wish to recruit younger talents. The authors also argue for an implementation of SSEs to assist the progress of the change of perspective of recruitment, from focusing mainly on technical skills to now looking for people with an entrepreneurial and business mindset. Further, the HR department raised the importance of having the right people at the right place (e.g. to let engineers be engineers) which has been mentioned by experienced idea providers to be the outcome of applying SSEs.

Legal and patent

The interviews with the legal department as well as with the patent department mainly showcased possibilities regarding ownership and opportunities with patents versus more conceptual ideas. There seems to be an agreement of complications and possible blockers could be avoided with ideas not including IP or patents. Also, the innovation managers indicated the organization could easily give away ideas without any IP, which they do not believe in. However, similar to the findings of the empirical study of existing solutions of applying SSEs, the interviewees implied a patent is usually seen as an advantage by investors. Further, the organization possesses a bank of patents and on a basis they discover non-relevant standard patents, and need to decide whether they need to let them go or not. Hence, there seem to exist patents SSEs could be applied to. Nevertheless, except for more legal and administrative work with patents, the legal perspective brough up several opportunities to solve the question of ownership. The alternatives mentioned were; (1) royalties (with the opportunity to agree on to pay royalties after exceeding a specific revenue), (2) to share it as open source, (3) license out and (4) shares. Both alternative (3) and (4) have been proven to function when applying SSEs, even though there seems to be some concerns regarding license.

5.2.1.2 Idea inventors

Similar to the idea inventor from SAAB, the idea inventors within the case organization mentioned the following driving forces to come up with ideas and to let someone else drive it; (1) commercialization of idea, (2) improve region and the society and (3) lack of time. The authors interpret (2) refers to stimulate innovation and (3) indicating they the wish to find someone with time to drive it, i.e. a resource. Thus, the motives are aligned with the experienced idea inventor (see Table 5.1), which the authors see as an opportunity for the case organization in order to implement SSE. Additionally, the idea inventors mentioned a willingness to spend time as an advisor, which both the literature and the empirical study imply as a success factor. Further, the authors argue for this statement to indicate they are more interested in more technical tasks than to become entrepreneurs, which sympathize HR's ambition to let engineers be engineers.

5.2.1.3 University

Both the business school and LTH seem to be unison in their view of an obvious spot for collaboration with the industry in the academia. Both institutions are already in different ways engaged with the industry, as well as they express their confidence in how an enhanced collaboration could provide students with a more practical and relevant education. At the business school, where a master´s program for entrepreneurship and innovation already is in place, the partnership between the industry and students seem to be a bit more obvious than at LTH, even though Johansson emphasized how LTH always are looking for more and new ways to engage with the industry.

At Lund School of Economics and Business, Norrsén expressed potential over how SSEs could fit both in the current master's program or in a course. Seemingly in line with what the case organization wants to achieve, Norrsén believes students could provide companies with a holistic and outside-in perspective, eagerness and fresh perspectives. Further, it should be highlighted that Norrsén claimed they have previously experimented with ideas from researchers, quite similar to the original concepts of the surrogate entrepreneur. Even though it have not resulted in any new ventures, this could be a great opportunity for an entry of ideas from the case organization.

Another factor which enhances this opportunistic scenario is, according to Norrsén, Lund University does not seem to be interested in ownership of potential created ventures, which

is in opposition to some of the experienced cases, but nonetheless a question which from interviews both with the case organization and students have shown to be decisive.

Concerning LTH, Johansson implied SSEs to be a potential to create a win-win situation for the academia and the industry. Even though there currently is no program specifically oriented around entrepreneurship at LTH, Johansson believes there is a great interest among students, which also was shown through the student questionnaire. There also seem to be additional opportunities at LTH regarding courses and credits where SSE could function, even though it would require some changes in the course. Specifically, Johansson mentions the course *"Engineering Training Course"*, which could be taken both during semesters and during summer. This indicates a potential for students to engage as a SSE without affecting their studies and still receive financing from CSN. Perhaps, this would simplify the process for the case organization, as they already have processes for internships in place. In the future, Johansson also expresses the potential to create a master's program in entrepreneurship.

5.2.1.4 Students

The empirical studies of students at Lund University provided several results indicating opportunities regarding usage of SSEs. As suggested in other interviews with universities and incubators, it seems to be a widespread and increased interest in entrepreneurship among the asked students, which could be considered a prerequisite for considering becoming a SSEs. A majority of students also indicated they had either thought of starting a start up or being part of a start up, whilst at the same time claiming they do not have any good ideas to create a start up around or not believing in their ideas, which is argued as an alignment with what Student Surrogate Entrepreneurship could provide students with. Finally, it is argued to be promising with more than 50% who would be prepared to take on someone else's idea with the intention to drive it as their own.

From the questionnaire it also appears as students' main motive to take on the idea of a company and drive it as their own is firstly to create a successful start up and secondly to gain practical experience of the entrepreneurial world. Whereas the first one appears to be aligned with the case organization's motives and the second one is aligned with the experienced students' motives.

An interesting result from the questionnaire is how, if given a choice, most students seem to prefer to run an idea on behalf of a company during summer (i.e as an internship or

summer job). This could create opportunities for the case organization to perhaps use current processes for such setups. This, in combination with students chose salary instead of ownership to be a reasonable compensation if they were SSEs as a part of an internship (they expressed a decreased demand for ownership compared to if it was in parallel to study) indicates interesting opportunities. Not least, since this would simplify the matter of ownership for the case organization.

5.2.1.5 Incubators

The mission of the interviewed incubators within the case organization's ecosystem is to foster and encourage innovation in the region, which is in line with stimulation of innovation, as mentioned as a motive for experienced stakeholders (see Table 5.1) as well as the case organization. They also strive to always broaden the opportunities for students to engage in entrepreneurship, which the authors argue could be fulfilled by engaging in collaboration through SSEs. Further, the incubators in the region seem positive to be, and already are to some extent, a *"middle-hand"* for someone who has an idea and someone seeking for one. Accordingly, they enhance the identified value exchange from incubators to idea providers by stating one value for companies to engage with incubators is the chance to meet driven students without spending much time on scouting for them. Further, the incubators concluded the benefits of their large network, which may be beneficial for students in order to succeed with a start up. Finally, the interviewed local incubators are non-profit driven incubators, and do not activity aim to gain profit. Thus, if the case organization include one of them in a collaboration through SSEs, they would probably not require ownership shares.

Regarding the trends among students argued as possibilities to implement SSEs, the incubators experienced a barrier for students to start a company is to not believe their business idea is unique enough to work with, together with the interest to be a part of a start up is extensive. This is also in line with the result of the student questionnaire.

Further, the incubators seem to argue for incentives for companies to collaborate with students within innovation are to get valid input from another perspective and employer branding. In the case of students working on a company's idea they also experienced companies to consider it a low-cost way of testing ideas. These were also identified as motives for idea providers to apply SSEs on their ideas.

5.2.2 Challenges to implement SSEs

5.2.2.1 Case organization

Innovation managers
What have been identified as main challenges or potential blockers for the case organization to implement SSEs are; (1) the difficulty of determining which ideas are outside core business, and (2) the structure, risk aversion, policies and mindset tend to hinder innovation. The authors associate the first challenge with the many industries the organization operates in, which is a difference from the cases of experienced idea providers SAAB and Stora Enso. Thus, it seems to be more difficult to determine the alternatives on what to do with an idea or patent, and the organization seems not want to risk to discover later on an idea could have been used as part of their core business. The second challenge, which the literature argues to relate to most large corporations, includes the difficulty of convincing top management to invest in something not directly resulting and can be measured in ROI (e.g. branding or stimulate innovation) as well as having a slow process to implement new collaborations, which require buy-in from top management. Additionally, in the case of ownership in a potential new venture, the organization seem to be skeptical to invest in small businesses, mainly due to the required administration in owning small shares.

Further, the organization seems to agree with the experienced idea providers perspective on less experienced student require support and coaching. The authors raise the question, as lack of time to explore all ideas seems to be of concern, if the case organization have the time to act as support. However, there seems to be a possibility for students to gain support externally (from the university or an incubator). Lastly, the innovation managers confirmed they would require to decide which students to take in, if they were to apply SSEs on internal ideas, which have proven the idea providers are not able to do within most cases.

Legal and patent
Regarding the challenges which come with a patent, it seems that many of the patents within the organizations is for defense play, to block others or would be very difficult for a student to work with. Also, the number of commercializable patents, which would be easier to spin-off, are decreasing. Hence, it seems to be a limited number of patents to be suitable for a SSE to drive. Further, when it comes to the more conceptual ideas (i.e. ideas within the idea inbox), the experience indicates it is hard to find a driver to those, which raise the question if they would be attractive enough for students. Additionally, the representatives

of the case organization seem to have a common perception of ideas within the inbox, at the stage they are in now, seem to have quite a low potential (because of a low technical novelty), which may cause a blocker to attract students and to gain ROI. However, as mentioned by one innovation manager, ideas may seem as they lack potential before someone has explored and iterated them.

5.2.2.2 Idea inventors

The authors did not identify any specific blockers from the idea inventors within the case organization, other than if a SSE would be applied on the idea in a later stage, the inventors expressed they probably would be more emotionally attached to the idea. Hence, it may be a challenge to let somebody else drive an idea which has already been explored to some extent.

5.2.2.3 University

Both Norrsén and Johansson expressed the difficulties of actually driving through change at their institutions. Johansson emphasized a new master's program can take up to four years to roll out, which raises concern if the case organization is prepared to invest the required time. Johansson also expressed it may be difficult to change current courses to be suitable for SSEs, even if this appears more plausible. Norrsén reasoned similarly concerning courses, implying how the management sometimes do more talking about it than actually intensifying their partnership with the industry.

Further, from the business school perspective, Norrsén experienced previous cases where students have taken on ideas from researchers showed the expected TTM often have hindered the students, which is aligned with challenges concerning ideas the experienced cases have proven. Concerning students, Norrsén brought up challenges regarding students seem to expect high ownership stakes, further confirming previous learnings of the matter of ownership to be crucial, as well as the current setup of the master's program at the business school is not clear regarding ownership and contracting if an external part provides with ideas. Further, the focus of their master's program, especially compared to the Chalmers program, is on personal development for the students and not to have the main focus on venture creation.

Other challenges from the university point of view concerns timing. Norrsén mentioned she sometimes struggle with companies' cycles do not match the semesters at the program. Johnsson also raised major concerns about what is supposed to continue after a finished surrogate project, especially if the SSE is part of a course and the students are not graduating after the project. It seems as it could be very likely to be in conflict with the expectations of the case organization, which probably would like to see the venture creation process to continue on. Further, Johnsson expressed the fear of students to be misused by companies and rather than focus on the education they would be put on productivity by companies, which is aligned with barriers experienced by former SSEs.

5.2.2.4 Students

Even though the result of the quantitative study indicated several opportunities, the questionnaire also revealed some potential contradictions concerning the students' mindset towards the other stakeholders. Quite few students seem to be interested in running a company's idea parallel to their studies, indicating the students can not spare time outside their education. In combination with the majority of students did not prefer to spend more than 15 hours a week on a project parallel to their studies, it appears hard to fulfill the expectations of the case organization and the commitments which entails acting as a SSE. Especially as the case organization is looking for SSEs because they lack time themselves. In addition, almost 70% of the students also expected ownership as compensation if they would run the project parallel to their studies, which previously have been established difficult for the case organization. It seems as there are several challenges related to becoming a SSE parallel to the studies.

In the scenario where the students would drive an idea as part of an educational program, almost 50% thought either ownership or salary would be a reasonable compensation (even though there was a higher number of students satisfied without any compensation compared to becoming a SSE parallel to study or as part of an internship). This could prove problematic, as shown with experienced cases and strengthened by the case organization. Further, Norrsén also expressed the contracting can be difficult as they are hard to standardize.

No matter which scenario (parallel to studies/internship or summer job/part of an educational program), it appears to be very important for the students to have influence over which idea to run, which appears reasonable, as it could be argued for a surrogate to fully take on an idea as their, they should be able to decide which idea to work with. However,

this could be problematic, especially if the SSE would be part of an educational program, as it could be hard to guarantee students to get their preferred idea, and was also highlighted through the existing solutions of applying SSEs.

Further, more than 50% of the students claimed the main motive for taking on an idea would be to get a practical entrepreneurial learning experience, which could rise challenges with the case organization. As the case organization's main motives have shown not to be educating students, but rather financial winning, stimulate innovation or branding, this appears to be a challenge which needs to be overcome.

5.2.2.5 Incubators

The local incubators expressed, similar to some of the experienced universities, an experienced conflict of interest between companies and incubators, when companies are only interested in recruiting to their core business, since they want as many students as possible to running own ideas. Further, also similar to what experienced universities expressed, they explained to not be able to guarantee students with specific competence, which has indicated to be a blocker for the case organization. Other than this, the authors did not identify any challenges for the case organization with including the incubator in collaboration through SSEs.

5.2.3 Internal-platform model for applying SSEs on company ideas

The empirical study of the case organization proposed a different setup for applying SSEs on company ideas than the experienced cases practice (i.e. the university-platform model and the intermediary-platform model). Hence, a potential third model has been identified, which is to structure SSE without introducing it on the platform of an intermediary, and instead use the company's internal platform. The model is further discussed and analyzed similarly to the other models.

5.2.3.1 Value exchanges between stakeholders and possibilities within model

The internal-platform model enables only the value exchanges between the idea provider, the idea inventor and the students in Figure 4.1, due to those are the only required stakeholders

within the model. Thus, the company could structure the SSE program or implementation as they wish, without any involvement from an intermediary, as long as the students are willing to join. Hence, it seems like the barriers mentioned with the university-platform model could be avoided through this model, such as (1) the company need to agree on giving away shares of a new venture to another part, (2) not be able to decide which students to drive their idea, (3) the time-consuming process of the setup of a new course or program at the university and (4) students may not be able to continue with the venture due to not the need to complete an education.

5.2.3.2 Variations within model

Because there is no identified case argued to fit into this model, it is hard to identify variation. However, even though neither the university nor incubator is the process owner, the authors argue they could be involved in some extent and scout for, and brand it, to students (e.g. by doing it pro-bono in order to increase the innovation in the ecosystem).

5.2.3.3 Barriers with model

Due to neither the university nor the incubator necessarily are not stakeholders within the internal-platform model, the links (value exchanges) to and from these areas in 4.2 are not being realized. Not surprisingly, the model does not fulfill the motive of a university-industry collaboration and a chance for a long term relationship. Similar to the intermediary-platform, neither the students would get provided with credits nor financed by CSN. Thus, the model would not provide with academic knowledge (i.e education) and the model also eliminates the safety net by having the university involved. The practical learning journey seems to be of importance to the students (see 5.2.1 Motives), which may need to be assured in another way in order to please the students (e.g. by a close relationship with a non-profit incubator, which may consider this as a pro-bono opportunity in order to stimulate innovation in the region). Similarly, the company may need to find external mentors the students can have support from in another way, if the company's employees lack time. The company also miss out on the natural source to different kinds of student profiles through the university. With the same argument, it may be harder for the company to gain the potential value of a free labor force when the students are not financed through CSN (illustrated as a potential value exchange in Figure 4.1). Further, the benefit of the incubator to contribute as a *"matchmaker"* may be missed.

Finally, it should be mentioned, the empirical study of existing solutions of applying SSEs did not identify any cases of this model, which the authors want to highlight The reason could be the phenomenon of Student Surrogate Entrepreneurship is not that well established and no company has come up with the idea to structure it through this setup. Another reason could simply be the benefits of having an external actor involved (such as the university or an incubator) contributes with many advantages which overcomes the advantage of the internal-platform model does not.

5.3 Decisions and Circumstances Affecting which Model to Apply

As proven in previous findings, different models enable different value exchanges (see figure 4.1), which implies the motive to be a decisive factor for deciding which model for a HTC to implement. By instance, if the company strive to achieve a strong partnership with the university and value to gain academic knowledge, the university-platform model is most suitable.

It was also found in the results of this study the external circumstances in the organizations' ecosystems affect which model that can and should be applied. Ecosystems containing strong and experienced stakeholders appear more suitable for close collaboration and partnerships with universities and intermediaries, whilst organizations in ecosystems with no prior experience of SSEs would probably have easier to invite surrogates through their internal platform. This could allow for agility and flexibility for the organization required for introduction, of the perceived new concept, of SSEs in the ecosystem.

Further, internal circumstances should be considered. It is logical to assume how different prerequisites inside the company should be considered before deciding which model to apply. Internal factors such as current processes, degree of experience in innovation, the possibility to reach out to relevant students as well as the time and resources the company can provide to students seem to be relevant factors to consider while deciding model. For example, an organization experienced in intrapreneurship would probably be more suitable to have an internal-platform model, as there would be skillful people and current processes to tap into. Whilst an unexperienced company probably would benefit from having the support of an intermediary or the university.

Chapter 6

Conclusion and Final Remarks

This chapter aims to contribute with an answer to the research question, by answering its three sub-questions. Further, it presents a general recommendation to the case organization on how to apply SSEs on internal ideas.

6.1 Answer to Research Question

How can high-tech companies apply Student Surrogate Entrepreneurs on internal ideas?

To answer the research question the following sub-questions (numbered RQ1 - 3) have been answered:

(RQ1) Which are the key stakeholders and what are their motives?

The study identified the following potential stakeholders with related motives to join a collaboration through SSEs on company ideas:

- **University** - with the motives; (1) university-industry collaboration, (2) practical learning journey (for the students), (3) commercialization of ideas/technology, (4) branding opportunity and (5) stimulate innovation within innovation ecosystem
- **Students** - with the motives; (1) practical learning journey and (2) gain resources

and competence

- **Idea provider** - with the motives; (1) university-industry collaboration, (2) financial winning, (3) commercialization of ideas/technology, (4) branding opportunity, (5) gain resources and competence and (6) stimulate innovation within innovation ecosystem

- **Idea inventor** - with the motives; (1) commercialization of ideas/technology, (2) gain resources and competence and (3) stimulate innovation within innovation ecosystem

- **Incubator** - with the motives; (1) university-industry collaboration, (2) financial winning (if profit-driven incubator), (3) commercialization of ideas/technology, and (4) stimulate innovation within innovation ecosystem

(RQ2) What are the key success factors in order to succeed with student surrogate entrepreneurship?

- **Focus on an exchange of resources with students**
  The motive supported by both the idea inventor and the students is to gain resources and competences. The authors derive from the study a success factor is a bilateral exchange of competences and resources between students and the company. Students provide with both time and other competences, which the company lack, and on the other side, the students benefit from getting an idea as well as the network, experience and infrastructure of a company. Thus, both parts can gain from exchanging a resource from one another. The authors conclude resources mainly going in one direction, e.g. for the company to take advantage of the students without letting them operate freely as entrepreneurs for the idea, inhibit a successful collaboration through SSEs.

  Further regarding motives, the study concludes (1) commercialization of ideas/technology and (2) stimulate innovation within innovation ecosystem, are the two motives supported by all potential stakeholders, when implementing a collaboration through SSEs. Hence, in order to increase the likelihood of creating a win-win situation when including all stakeholders, the collaboration should focus on commercialization of ideas/technology and stimulation of innovation within the innovation ecosystem.

- **Provide technical support from the idea inventor**
  The authors conclude technical support from the inventor is crucial when applying SSEs and the surrogate should rather complement the inventor with other competence than the technical ones. Further, the technical novelty of the idea has an impact of the

level of support required from the inventor, which should be taken into consideration.

- **Find external mentors for surrogates**
  The study indicates companies often do not have sufficient time to coach the less experienced students. The recommendation is coaching through a mentor to be provided through the university or an incubator (as a compliment to a mentor and the technical support within the company).

- **Provide the students with some education**
  Education on innovation and entrepreneurship is beneficial and necessary for the non-experienced students in order to succeed and increase the efficiency. Therefore, the company should be aware of different degrees of responsibility of education follows with different models used to apply SSEs.

- **Accept the student's learning journey**
  The study concludes neither SSEs nor the university is satisfied if the company only focus on financial winning and corporate branding, as well as the learning journey, is of high importance to the students. Hence, a successful collaboration through SSEs requires the company to accept the students to have a learning process and how it may not be fully efficient all the time.

- **Let go of control**
  For a SSE to succeed with creating a venture, the study established the idea provider need to let go of control and let the student operate freely as an entrepreneur. If not, it may cause blockers in terms of inefficiency, the risk for the student to not be able to perform crucial tasks and for the student to loose interest. Hence, by overly controlling the students the company may miss out on the new perspective and new learnings the students could provide with.

- **Utilize an incubator or the university to scout for students**
  The authors conclude it might be difficult, or time-consuming for the company to scout for students on their own. The main benefit for a company to include an incubator in collaboration through SSEs, is the network of students interested in entrepreneurship, from which the incubator can scout for talented students. Further, one benefit with the university is its access to a wide base of students with different backgrounds and competence, which the company can benefit from.

- **Apply a diversified group of students to the idea**
  The study concludes a diversified group of SSEs perform better than those who are homogeneous. As described earlier, diversity can be found through the university's wide base of students.

- **Settle the question about ownership and form a contract**
  Even though the study was not able to conclude a specific ownership model to increase the likelihood of success, it derives the question of ownership to be of high importance and a need for a clear structure. However, the authors discovered, in order for the company to gain high bargaining power (and possibly full ownership of a potential venture) they have to pay a fee to either the university or an incubator, or applying the internal-platform model, which seems to require, at minimum, salary for the students. To be able to test an idea for free, the company have to agree on giving away ownership shares in a potential venture or license out technology. However, the study indicates if the students only have access through license, it might hinder the students to perform all tasks needed for driving the company. Further, a shared ownership model gives all stakeholders motives to create a successful project and an investment pool facilitates future investment. Finally, a conclusion is made for the company to own a too big share hinder future investment, and giving a share to the inventor indicate trust for investors (at least if is a patent involved).

- **Be involved in the matching process as well as let the student influence it**
  By letting the students have a greater impact on which idea to drive, the likelihood of the SSE having a commitment to the idea increases. Similar, companies seem to value to be able to choose students. The authors conclude the matching process (between SSEs and ideas) most suitable to be performed similar to a regular recruitment process of employees, in which the company submits a request for which the students can apply.

- **Utilize non-core, early-stage ideas with short TTM**
  The study concludes the most suitable ideas for companies to apply SSEs on are those outside their core business. Further, they should be early-stage, because it benefits to let students drive it (otherwise a more experienced Surrogate Entrepreneur could be applied). Also, ideas with some technical novelty seem most attractive for students as well as they are easier to argue for why the idea provider should have a share. Finally, the study showcases the plausible outcome of giving the student an idea with a long

TTM is a loose of interest from the student.

- **Consider internal and environmental conditions when deciding upon which model to apply**
  Both the internal, as well as the environmental possibilities and blockers in the ecosystem have an influence on what is the most suitable model to implement, in order to apply SSEs on internal ideas.

- **Consider the timing for the student**
  The authors conclude, in order for the student to continue with a potential venture after being a SSE as part of the university-platform model, the idea provider should assure the student has potential to do it and not have to continue his/hers education afterward, and thus lack the time to drive a venture.

(RQ3) What different models can be utilized and what are their advantages and disadvantages?

The authors have identified three different models which could be used for applying SSEs on company ideas. Two of the identified models have been identified through the existing solutions of applying SSEs, whilst the last one is a result of the empirical study of the case organization and its local ecosystem. Each of the models come with variations, as well as different advantages and disadvantages.

(1) The university-platform model

In the university-platform model, the university is the initiative taker for the collaboration. By this, the university takes great responsibility for the surrogacy to be performed correctly and under secure forms. For a cost (sometimes a fee, sometimes equity) idea providers are invited to participate and in exchange the university provides access to the students. It can be done with different time frames; through a course or through a program. Since the university is considered the owner of the process, they also regulate most of the terms such as matching, work load and cost.

Advantages

- There is an educational structure to rely on, concerning supervisor, courses, student

funding, credits, and network

- It has proven successful through previous empirical cases
- It could intensify and improve the company's relationship and partnership with universities
- It requires less time and input (such as coaching) from the company
- The company can access diversified groups of students through the university

Disadvantages

- The company have to follow the regulations set out by the university
- It may take time to implement such collaboration
- There is a price to participate (either in terms of a fee or by giving away ownership shares)
- The company have to adapt to the academic calendar
- It might be difficult for the company to influence which students will be assigned
- There are concerns about what happens after a finished course (if not the final part of the education)

(2) The intermediary-platform model

In the intermediary-platform model the SSE and the idea provider meets at an intermediary's platform. From the empirical study, the intermediary is an incubator, taking responsibility for the conditions under which the surrogacy is performed. The idea provider may have to pay a fee to participate and for the resources provided by the intermediary (if the incubator is profit-driven). However, the intermediary is still assumed to be the process owner and thereby responsible for the quality of the collaboration.

Advantages

- An collaborative partner which appears to be more agile and flexible than the univer-

sity

- The company can access students who are considered interested in entrepreneurship
- The intermediary can act matchmaker between students and ideas
- A structure and routine within entrepreneurship which is available at incubators
- A collaboration can foster a future relationship with the incubator
- It may take less time to implement such collaboration, compared to collaborating with the university

Disadvantages

- The student does not have the same safety net as through the university
- The education provided might be less comprehensive
- There might be a cost to participate
- Since students are participating outside the university they might have higher demands
- Less diversified group to choose from for the idea providers

(3) The internal-platform model

The internal-platform model suggests the student and idea provider connect without neither the university nor an intermediary, but at the company's internal platform. The company could set the conditions and have full responsibility for structure and outcome of a collaboration with the SSE.

Advantages

- Few stakeholders involved and therefore fewer demands to take into account
- The company can remain full control of the process and can set conditions
- Potential to allow the SSE to tap into current processes at the company

- The company can choose which students to run their idea
- The chance for quick implementation

Disadvantages

- Since students are participating outside the university they might have higher demands
- The company need to spend a bigger investment of resources (i.e supervision, education)
- The company have to scout for students on their own
- No previous findings of successful cases

6.2 Recommendation for Case Organization

The authors conclude the case organization would benefit the most by utilizing the university platform model. This model would provide the the case organization with the most advantageous conditions, in order to achieve their preferred values, to the lowest risk and investment. However, following the reasoning in 5.3, it is concluded that the internal and external factors points out the ecosystem is not fully prepared for the university model.

Thus, the recommendation for the case organization on how to apply SSEs on internal ideas is therefore a three-step process (in which the final step is to apply SSEs through the university-platform model):

(1) Apply the internal-platform model for proof of concept

The authors conclude a barrier performing collaboration through SSEs in full scale (to create a venture and spin out the idea from which the organization can profit from, e.g. by shares) is to get buy-in from top management, which seems to be skeptical to small shares in companies. Thus, the authors recommend the organization to try Student Surrogate Entrepreneurship in a proof of concept, by recruiting students to an internship/summer job (which the students in the region seem to prefer over the educational option as well as in parallel to studies), in which they can internally drive an idea from the idea inbox as a project. Further, salary as compensation for the students is less complicated and comes

with fewer blockers than ownership shares or license out technology.

The organization already have a process to let employees drive another employee's idea, in which the authors suggest a student could be implemented. By this, the organization could benefit from getting an indication if an idea has potential, at a lower cost than for an ordinary employee to work on it. Additionally, this would fulfill the incentive of talent retention and stimulation of innovation in the region. Hence, a first step to apply SSEs on internal ideas would be the internal-platform model, which probably has the shortest implementation time, as well as there is no university or incubator in the region completely ready for the other models.

What: An internship or summer job allows students to drive ideas as SSEs (but as an internal project)

How: Compensate the students with salary (without ownership), use conceptual ideas from the organization's idea inbox, provide the students with coaching and education through current internal processes

Why: There are no current university- or intermediary-platform model to tap into, the top management needs to be convinced to fully implement the concept, the case organization does not want small ownership shares, difficult for the organization to know what is outside core business, students in the region are interested in driving ideas as part of internship with salary compensation, the organization have a process for internship

Outcome: Branding and talent retention, the opportunity to explore the potential of ideas, prove the concept of Student Surrogate Entrepreneurship, no strategic partnership, no expected venture creation by students

(2) Intensify collaboration with university and incubator

The organization already have a close relationship with both the university and incubators interested in collaborating through SSEs. However, there is no fully structured process to implement the university- nor the intermediary-platform, and therefore the authors recommend the organization to include the university and incubators at some extent in order to prove a concept. Further, the authors conclude other models require more idea inventors (companies or others) in order to have enough incentive for the process owner to implement the university- or the intermediary-platform model. For the university or the incubators to try the concept with the case organization, it can be a way to convince other idea providers

to apply the concept.

The authors recommend the case organization to provide ideas to the master's program at the business school, in which they have previously experimented with ideas from researchers, even though it is not structured around ownership and contracting. However, it could be a way to test collaboration with the university, but in a less structured way and more similar to letting the students drive an internal project. Further, the organization can initiate a collaboration with an incubator within the matching and scouting process.

What: Involve intermediary and/or university in small scale

How: Provide ideas through a course, access students by using a non-profit incubator or the university, the company have full ownership, utilize the university or incubator in small scale for education and coaching

Why: To prepare and learn for full implementation of SSE collaboration with other stakeholders, incubators seem interested to be an intermediary for the matching process

Outcome: Proof of concept with other stakeholders, prepare other stakeholders

(3) Fully integrated university-platform model

In order to fulfill the case organizations motives with financial winning, talent retention, stimulation of innovation within the ecosystem and collaboration with the university as well as to fulfill the motives of the students, the authors conclude the university-platform model should be the final step. However, as implied by the empirical study, this may have an implementation time of four years. Further, a prerequisite for the case organization have buy-in from top management as well as be able to decide for which ideas to give to students, which the authors conclude has a higher likelihood to be achieved by following the first to steps in the recommendation.

What: Provide ideas through a master's program

How: Ideas with IP, shared ownership of the potential venture

Why: To apply SSEs in full scale

Outcome: Potential ownership shares of venture created by SSE, strong intensified relations

with the university

Validation of recommendation
The plausibleness as well as credibility of the recommendation was validated with the case organization through a meeting with 14 people from the organization, representing innovation managers, HR, legal, patent department as well as idea inventors.

6.3 Contributions, Future Research and Limitations

This thesis had the purpose to contribute to the literature and increase the knowledge of Student Surrogate Entrepreneurship and indifference from most of previous studies, shift the focus from the academic perspective to the industrial. This has mainly been done by answering the research question and thereby present insights regarding stakeholders and their motives, success factors when applying SSEs and three potential models of application.

Because of the exploratory approach, the many factors and stakeholders affecting the application of SSEs, the study took on a wide perspective. The authors decided to interview fewer individuals from all the identified stakeholder groups, rather than excluding any group and prioritizing more several individuals from one group. However, even if this appeared to be necessary to fully answer the research questions, it should be noticed how a wide approach might delude the conclusions, as one or a few individuals do not have to be representative for the group.

For future studies the authors propose a more narrow approach, specifically focusing on one model or one stakeholder's perspective. In addition, as the focal point, if this study has been towards a qualitative methodology, the authors further suggest more quantitative results which could validate the findings of this study.

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Appendix A

Case Organization

The case organization is a global high-technology company with more than 100 000 employees worldwide, and is active across several technology areas, ranging from electronics to entertainment. R&D activities and innovation have been a prioritized subject for the case organization in recent and the organization has the ambition to improve and develop further within these areas.

The case organization currently has a systematic approach for promoting and nurturing innovative ideas within the organization, which is referred to as *The Innovation Journey*. The first step of the innovation journey involves the submitting of ideas from employees to the *idea inbox*, which is open for all employees. When submitting an idea in the inbox, the inventor adds a title together with tagging it accordingly:

- *Driver Needed* - indicates the inventors wish someone else to drive the idea
- *Team Needed* - indicates the inventor does not have a team and would like to have others to collaborate with
- *Give Away* - indicates the inventor does not intend to do anything with the idea, and just wants to inform about it

In addition, employees can sign up to be drivers in the system as well.

The case organization, also run an accelerator (including funding, support, and education) for start ups, where both internal and external start ups are invited to take part.

Appendix B

Student Questionnaire

In total 60 students (55 people from LTH and 5 people from Sten K. Johnsson - Center for Entrepreneurship) at master level at Lund university answered a questionnaire regarding their interest in entrepreneurship and their input on different scenarios driving a company's internal idea. All questions required exactly one answer except for question Q16 and Q22, to which the participants could choose multiple answers. The questionnaire was sent out to approximately 300 students.

Q1. Are you a student at Lunds university?

Answer Choices	Response Percent	Responses
Yes	100.0%	60
No	0.0%	0

Q2. Are you a master student?

Answer Choices	Response Percent	Responses
Yes	91.67%	55
No	8.33%	5

Q3. At which Institution do you study?

Answer Choices	Response Percent	Responses
LTH	91.67%	55
Sten K. Johnsson (Center for entreprenuership)	8.33%	5
Other	0.0%	0
I don't know	0.0%	0

Q4. Are you an exchange student?

Answer Choices	Response Percent	Responses
Yes	1.67%	1
No	95.0%	57
I don't know	3.33%	2

Q5. What is your gender?

Answer Choices	Response Percent	Responses
Man	55.0%	33
Woman	45.0%	27
Other	0.0%	0

Q6. Are you interested in Entrepreneurship?

Answer Choices	Response Percent	Responses
1. Strongly disagree	1.92%	1
2.	3.85%	2
3.	13.46%	7
4.	13.46%	7
5.	30.77%	16
6.	11.54%	6
7. Strongly agree	25.0%	13
I don't know	0.0%	0

Q7. I have thought of starting my own start-up

Answer Choices	Response Percent	Responses

1. Strongly disagree	3.85%	2
2.	11.54%	6
3.	11.54%	6
4.	11.54%	6
5.	19.23%	10
6.	21.15%	11
7. Stronlgy agree	21.15%	11
I don't know	0.0%	0

Q8. I have thought of being part of a start-up

Answer Choices	Response Percent	Responses
1. Strongly disagree	3.85%	2
2.	0.0%	0
3.	5.77%	3
4.	11.54%	6
5.	25.0%	13
6.	23.08%	12
7. Stronlgy agree	28.85%	15
I don't know	1.92%	1

Q9. I have/had an idea/ideas which I could create a start-up around

Answer Choices	Response Percent	Responses
1. Strongly disagree	7.69%	4
2.	21.15%	11
3.	13.46%	7
4.	5.77%	3
5.	19.23%	10
6.	7.69%	4
7. Strongly agree	25.0%	13
I don't know	0.0%	0

Q10. I believe it is a barrier to start my own business because I don't have any ideas

Answer Choices	Response Percent	Responses
1. Strongly disagree	9.62%	5
2.	3.85%	2
3.	21.15%	11
4.	15.38%	8
5.	34.62%	18
6.	7.69%	4
7. Strongly agree	7.69%	4
I don't know	0.0%	0

Q11. I believe it is a barrier to start my own business because I don't believe in my ideas

Answer Choices	Response Percent	Responses
1. Strongly disagree	9.62%	5
2.	15.38%	8
3.	19.23%	10
4.	9.62%	5
5.	17.31%	9
6.	21.15%	11
7. Strongly agree	3.85%	2
I don't know	3.85%	2

Q12. I would be willing to take someone else's idea and drive it as my own with the purpose of creating a start-up

Answer Choices	Response Percent	Responses
1. Strongly disagree	1.92%	1
2.	9.62%	5
3.	17.31%	9
4.	13.46%	7
5.	19.23%	10
6.	21.15%	11
7. Strongly agree	15.38%	8
I don't know	1.92%	1

Q13. I believe it is important to have a mentor or a supervisor in order to succeed with creating a start-up from someone else's idea

Answer Choices	Response Percent	Responses
1. Strongly disagree	0.0%	0
2.	1.92%	1
3.	21.15%	11
4.	13.46%	7
5.	32.69%	17
6.	17.31%	9
7. Strongly agree	9.62%	5
I don't know	3.85%	2

Q14. If I took on the entrepreneurial role for someone else's idea, I would like the idea to have a high technical novelty

Answer Choices	Response Percent	Responses
1. Strongly disagree	1.92%	1
2.	9.62%	5
3.	13.46%	7

4.	17.31%	9
5.	19.23%	10
6.	11.54%	6
7. Strongly agree	5.77%	3
I don't know	21.15%	11

Q15. If I took on the entrepreneurial role for someone else's idea, I would like the idea to be early stage

Answer Choices	Response Percent	Responses
1. Strongly disagree	0.0%	0
2.	5.77%	3
3.	7.69%	4
4.	19.23%	10
5.	25.0%	13
6.	21.15%	11
7. Strongly agree	15.38%	8
I don't know	5.77%	3

Q16. What would be your main incentive to do it?

Answer Choices	Response Percent	Responses
Gain practical entrepreneurial experience	53.06%	26
Get in contact with the company (e.g. for future employment)	28.57%	14
The possibility to create a successful startup	85.71%	42
I don't know	2.04%	1
Other (please specify)	6.12%	3

Q17. Would you prefer to drive the idea as a part of your education, parallel to your studies (in your spare time) or as an internship/during summer?

Answer Choices	Response Percent	Responses
Part of education	12.24%	6
Parallel to studies	10.2%	5
When I am not studying (i.e an internship or during summer)	67.35%	33
No opinion	10.2%	5
Other (please specify)	0.0%	0

Q18. If you would drive the idea outside the university, would you prefer to engage directly with the company or through a third-party (e.g an incubator)?

Answer Choices	Response Percent	Responses
Engage through a company directly	51.02%	25
Engage through a third party (e.g an incubator)	20.41%	10
No opinion	28.57%	14

Q19. If you would drive the idea in parallel to your studies, how many hours a week would you be prepared to put in a project like this?

Answer Choices	Response Percent	Responses
0-5 hours	4.08%	2
5-10 hours	18.37%	9
10-15 hours	44.9%	22
15-20 hours	22.45%	11
>20 hours	4.08%	2
No opinion	6.12%	3

Q20. If you would drive someone else's idea (parallel to your studies) with the purpose of creating a start-up, what kind of compensation do you think would be reasonable?

Answer Choices	Response Percent	Responses
An ownership share in a potential incorporation	69.39%	34
Salary for the hours put in	22.45%	11
No compensation, the experience would be enough	2.04%	1
I don't know	2.04%	1
No opinion	0.0%	0
Other (please specify)	4.08%	2

Q21. If you would drive the idea in parallel to your studies, how important would it be that you can influence/chose which idea to work with?

Answer Choices	Response Percent	Responses
1. Not important at all	0.0%	0
2.	0.0%	0
3.	0.0%	0
4.	6.12%	3
5.	22.45%	11
6.	32.65%	16
7. Very important	38.78%	19
No opinion	0.0%	0

Q22. If you would drive someone else's idea as part of an educational program with the purpose of creating a start-up, what would be the reason/reasons that you would like it to be a part of your education?

Answer Choices	Response Percent	Responses
I would like to get credits of doing this	57.14%	28
I would like to be eligible for student funding/loan	38.78%	19
I would like support from mentors at the university	44.9%	22
I would like to get theoretical tools/education	44.9%	22
I don't have the time to do something in parallel to my studies	12.24%	6

I don't know	6.12%	3
Other (please specify)	4.08%	2

Q23. If you would drive the idea as a part of your education, how important would it be that you can influence/chose which idea to work with?

Answer Choices	Response Percent	Responses
1. Not important at all	0.0%	0
2.	0.0%	0
3.	2.04%	1
4.	16.33%	8
5.	34.69%	17
6.	24.49%	12
7. Very important	22.45%	11
No opinion	0.0%	0

Q24. If you would drive someone else's idea (as a part of an educational program) with the purpose of creating a start-up, what kind of compensation do you think would be reasonable?

Answer Choices	Response Percent	Responses
An ownership share in a potential incorporation	37.5%	18
Salary for the hours put in	20.83%	10
No compensation, the experience would be enough	37.5%	18
I don't know	4.17%	2
Other (please specify)	0.0%	0

Q25. If you would drive the idea as a part of an internship/summer job, how many weeks would you prefer it to be?

Answer Choices	Response Percent	Responses
0-5 weeks	0.0%	0
5-10 weeks	48.98%	24
10-15 weeks	38.78%	19
15-20 weeks	4.08%	2
>20 weeks	8.16%	4
No opinion	0.0%	0

Q26. If you would drive someone else's idea (as an internship/summer job) with the purpose of creating a start-up, what kind of compensation do you think would be reasonable?

Answer Choices	Response Percent	Responses
An ownership share in a potential incorporation	30.61%	15
Salary for the hours put in	67.35%	33
No compensation, the experience would be enough	0.0%	0
I don't know	0.0%	0
Other (please specify)	2.04%	1

Q27. If you would drive the idea as part of an internship/summer job, how important would it be that you can influence/chose which idea to work with?

Answer Choices	Response Percent	Responses
1. Not important at all	0.0%	0
2.	2.04%	1
3.	6.12%	3
4.	24.49%	12
5.	20.41%	10
6.	24.49%	12
7. Very important	22.45%	11
No opinion	0.0%	0

Appendix C

List of universities with Venture Creation Programs

Country	university	Program	Established
Sweden	Chalmers university of Technology	Chalmers School of Entrepreneurship	1997
Norway	university of Tromsø	Business Creation and Entrepreneurship	2003
UK	university of Huddersfield	Enterprise Development	2009
UK	university of Buckingham	Business Enterprise	2006
USA	Colorado State university	Global Social and Sustainable Enterprise	2007
USA	Oklahoma State university	Master's in Entrepreneurship	2010
USA	university of Oregon	Technology Entrepreneurship Program	2001
Belgium	Université Catholique de Louvain	Formation interdisciplinaire en Création d\'entreprise (CPME)	1997
USA	Babson College	Entrepreneurship Intensity Track	1999
USA	Georgia Tech	TI:GER Program	2002
USA	North Carolina State university	Technology Entrepreneurship and Commercialization program (TEC)	1995
Finland	Aalto university	Entrepreneurship Master Program	2009
USA	university of Texas at Austin	Master of Science in Technology Commercialization (MSTC)	1996
Singapore	Nanyang Technological university	Technology and Innovation Program (TIP)	2002
UK	Coventry university	Enterprise and Entrepreneurship	2007
Russia	Moscow School of Management	SKOLKOVO MBA Programme	2009
Norway	Norweigan university of Science and Technology	NTNU School of Entrepreneurship	2003

Source: http://vcplist.com/2018/10/19/sustainable-venture-creation-programs-list/ (2019-05-22)

Appendix D

Interview Guides

For universities from existing solutions of applying SSE

What we would like to learn:

- Understand how the program/course works (details concerning ownership, resources, and costs, matching and the ideas)
- The purpose of the program/course
- How the program/course developed and if and what changes which have been done over time
- If there are any challenges
- Thoughts on stakeholders motives to join a collaboration through SSEs

Questions:

(1) Why was the program/course introduced? What was the purpose? (2) Can you tell us about the program in its current form? (3) What is required from the participating companies? Do companies pay to participate? What role has the idea inventor? (4) How do you match ideas with students? What factors determine? How many students are there in every team? What type of students? (5) How does the contract look like? (6) What kind of ideas do you accept? Do any specific kind of ideas turn out more successful than others? (7) Can you tell us a little bit about the history of the program/course? How has

it changed over time? Is there anything in the current program form that has to be improved? Did you try something that did not work out well? (8) How would you describe the motives for the; university, students, companies, idea inventor and (incubators) to be involved in the collaboration? What kind of feedback do you receive? (9)How do you measure success of the program? (10) What would you say are important ingredients for a successful university-industry collaboration within innovation? Are there any potential contradictions?

For students from existing solutions of applying SSE

What we would like to learn:

- Understand the student perspective on the setup regarding ownership, resources, and costs, matching and the ideas
- The reason why he/she became a SSE
- What worked well and what did not work well (what needs to be improved)
- What is the biggest opportunities of being a SSE?
- If there are any challenges to be an SSE

Questions:

(1) When and how were you a SSE? (2) Why did you choose to become a SSE or why did you attend the course/program? (3) Can you describe how the following things worked; ownership, resources and costs, what kind of idea you drove and matching with idea/compose team? Are you satisfied with the setup regarding those things? What could be improved? (4) What is your main learnings and benefits from being a SSE? Are you happy you did this? Do you believe it is a good way to start a business? (5) How would you describe the motives for the; university, students, companies, idea inventor and (incubators) to be involved in the collaboration?

For idea providers from existing solutions of applying SSE

What we would like to learn:

- Idea providers (companies) motives for applying SSEs on internal ideas
- Understand the idea providers perspective on the setup regarding ownership, resources, and costs, matching and the ideas

- What worked well and what did not work well (that needs to be improved)
- The possibilities to let a student drive an internal idea
- If there are any challenges to be an SSE

Questions:

(1) What is your role at the company? Tell us about the role you had during the collaboration through SSE (2) What was the company's main motive to let students run an internal idea? (3) Can you describe how the following things worked; ownership, resources and costs, what kind of ideas that students drove and matching with an idea/compose team? Are you satisfied with the setup regarding those things? What could be improved? (4) Are you the company satisfied with this? Do you believe it is a good way to explore the potential of an idea? What was the outcome of the collaboration? What value was obtained? (5) What would you say is the biggest difference of letting students drive your ideas/patents rather than your own employees? (6) How would you describe the motives for the; university, students, companies, idea inventor and (incubators) to be involved in the collaboration?

For idea inventors from existing solutions of applying SSE

What we would like to learn:

- Idea inventors motives for applying SSEs on his/hers idea
- Understand the idea inventor's perspective on the setup regarding ownership, resources and costs, matching and the ideas
- What worked well and what did not work well (that needs to be improved)
- What the possibilities are to let a student drive their idea, compared to drive it his-/herself or letting another employee drive it
- If there are any challenges to let a SSE drive their idea

Questions:

(1) What is your role at the company? Tell us about the role you had during the collaboration through SSE What did you provide with to the students? (2)How was it decided to let your idea be driven by students? What was your main motive to let students run your idea/to not drive it by yourself? (3) Can you describe how the following things worked; ownership, resources and costs, the characteristics of the idea and matching

with idea/compose team? (4) Are you satisfied with the setup regarding those things? What could be improved? What is your main learnings from giving away your idea to students? What was the outcome? What value was obtained? (5) What would you say is the biggest difference of letting students drive your idea/patent rather than you or other employees? (6) How would you describe the motives for the; university, students, companies, idea inventor and (incubators) to be involved in the collaboration?

For incubators from existing solutions of applying SSE

What we would like to learn:

- Understand how the model for apply SSE on external idea providers' ideas works (details concerning ownership, resources and costs, matching and the ideas)
- The purpose of structuring the collaboration through SSEs
- How the collaboration has been developed and if and what changes that have been done over time
- If there are any challenges
- Thoughts on stakeholders motives to join a collaboration through SSEs

Questions:

(1) Why was the collaboration through SSEs introduced? What was the purpose? (2) Can you tell us about the collaboration in its current form? (3) What is required from the participating companies? Do companies pay to participate? What role has the idea inventor? (4) How do you match ideas with students? What factors determine? How many students are there in every team? What type of students? (5) How does the contract look like? (6) What kind of ideas do you accept? Do any specific kind of ideas turn out more successful than others? (7) Can you tell us a little bit about the history of the collaboration? How has it changed over time? Is there anything in the current form that has to be improved? Did you try something that did not work out well? (8) How would you describe the motives for the; university, students, companies, idea inventor and (incubators) to be involved in the collaboration? What kind of feedback do you receive? (9) How do you measure success? (10) What would you say are important ingredients for a successful university-industry collaboration within innovation? Are there any potential contradictions?

For the case organization

What we would like to learn:

- The purpose of the innovation system (and its idea inbox)
- The challenges and opportunities of the innovation system
- The objective to collaborate with universities/students
- Potential challenges and opportunities of letting students run internal ideas

Questions:

(1) What is the purpose of the innovation system at the case organization? What value do you want to achieve? Do you think there are any problems/barriers with the innovation system? Is there a problem with many ideas not having a driver? Do you think there are any unused potential? Why do you think there's a lot of ideas missing a driver in the idea inbox? (2) In what ways are the case organization collaborating with universities or students today? What is your experience from former collaborations? What value do you wish to obtain from collaborating with universities/students? (3) What do you think about letting students explore internal ideas? Are there any challenges and opportunities regarding; ownership, resources and costs, the characteristics of the idea and matching with idea/compose team?

For universities within the case organization's local ecosystem

What we would like to learn:

- Understand if the university is interested to broaden collaborations with companies within innovation and entrepreneurship
- The university's perspective of letting students drive a company's idea through a program/course
- The possibilities and blockers to join a collaboration through SSEs
- Their motives to join such collaboration

Questions:

(1) What is the current touch point to collaborate with the industry within innovation and entrepreneurship? What is the objective to collaborate? (2) Can you tell us about the collaborations in its current form? What is required from companies? What would you say are important ingredients for a successful university-industry collaboration within

innovation? Are there any potential contradictions? How would you describe the motives for the; university, students, companies, to be involved in the collaboration? (3) Do you lack any specific collaborations? (4) Do you believe students are interested in entrepreneurship? Do you have sufficient practical entrepreneurship education? (5) What is your input on letting students drive a company's idea through a course or program? What are the possibilities and blockers? What would be required to implement such collaboration? What stakeholders do you believe could be involved? What do you think would be their motives?

For idea inventors within the case organization

What we would like to learn:

- Idea inventors motives for submitting ideas
- Idea inventors motives to let someone else drive their idea
- What their input to let a student drive their idea, compared to drive it his-/herself or letting another employee drive it

Questions:

(1) Why did you submit your idea in the idea inbox? Why did you not want to drive it by yourself? What kind of person do you see driving the idea? (2) What do you think about letting a student drive your idea? What would you say would be the biggest difference of letting students drive your idea/patent rather than you or other employees? What are the possibilities and blockers? What is your input regarding; ownership, resources and costs, the characteristics of the idea and matching your idea with the right student?

For incubators within the case organization's local ecosystem

What we would like to learn:

- The incubator's experience on university(student)-industry collaboration
- The incubator's objective to be a part of university(student)-industry collaboration
- Understand if the incubator is interested to broaden collaborations with companies within innovation and entrepreneurship
- The incubator's perspective of letting students drive a company's idea
- The possibilities and blockers to join a collaboration through SSEs

- Their potential motives to join such collaboration

Questions:

(1) What is the incubator's mission? What is the objective to collaborate with companies versus universities/students? (2) Can you tell us about the collaborations with companies its current form? What is required from companies? What would you say are important ingredients for a successful university-industry collaboration within innovation? Are there any potential contradictions? How would you describe the motives for the; university, students, companies, and the incubator to be involved in the collaboration? (3) Do you lack any specific collaborations? (4) Do you believe students are interested in entrepreneurship? Do you think they have sufficient practical entrepreneurship education? Do you believe there are students that would like to be entrepreneurs but lack ideas? (5) What is your input on letting students drive a company's idea? What are the possibilities and blockers? Could you be/would you be willing to be a potential stakeholder within such collaboration? What could be your role?