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How do Swedish SMEs overcome the barriers of open innovation in practice?

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Abstract

As the closed innovation model requires firms to be strongly reliant on their own R&D-capabilities in order to generate new innovations (van de Vrande et al., 2009, p. 425), a new approach has emerged over the last decade: The open innovation model. Open innovation is a model where organizations commercialize both their own and external ideas through purposive out and inflows of information (Chesbrough, 2006, p. 1). As a result, enterprises can benefit from the reduction of costs it infers, and simultaneously gain a larger amount of competence (Ghezzi et al., 2018; Rehman et al., 2018; Dodgson et al., 2006).

The open innovation model favors smaller firms and gives them an increasingly prominent position in the innovation landscape (Chesbrough, 2003, cited in van de Vrande et al., 2009, p. 427), and since SMEs are limited by a lack of financial resources, manpower, and substitutes for lack of sales, they especially benefit from collaboration with external parts to increase innovation performance (Hanna & Walsh, 2002; Kaufmann & Tödtling, 2002). However, successfully implementing an open innovation model as an SME comes with its unique challenges. In this study we will aim to investigate how SMEs in Sweden addresses these barriers through the following research question:

How do Swedish SMEs overcome the challenges of open innovation in practice?

The purpose of our study was to explore how SMEs overcome the barriers of working with open innovation in order to provide guidance for organizations who struggle to do so. To answer our research question and fulfill our purpose, we have conducted semi-structured interviews with eight different decision-makers from eight different SMEs. We performed a thematic analysis with an inductive approach. Our study found many ways that SMEs overcome barriers related to open innovation and resulted in several actions for decision-makers to overcome different categories of barriers.

From a theoretical standpoint, our study contributes with a new perspective on the existing literature. It complements what is claimed to be an under-researched area, not only for open innovation in SMEs in general (Lee et al., 2010, p. 299), but also with a focus on overcoming innovation barriers (Hölzl & Janger, 2012, p. 25). It also brings a new geographical perspective of the concept, providing insights from the Swedish innovation climate.

Keywords: Open innovation, Swedish SMEs, overcoming barriers/challenges

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1. Introduction chapter

The introduction chapter serves the purpose of providing the reader with a presentation of the subject and why we have chosen to research it, its problem background, purpose, and the limitations of the study. The research gap will also be described and thus act as a starting point for the research question.

1.1 Subject choice

We are two business management students at Umeå University. Parallel to the studies, innovation is heavily involved in our work, and is also a personal interest. Thyrestam works at a company that aims to be a thought leader in innovation and provides a software solution that helps clients of different sizes with their innovation processes. Fredriksson has experience in innovation from entrepreneurial endeavors, in the form of starting a company. This means that we have worked with innovation and have first-hand experience not only from the innovation process as such, but also from the perspective of a small to medium sized enterprise. Thyrestam first came into contact with the concept of open innovation from his employer and introduced the concept to Fredriksson. After researching the subject further in preparation for the study, we both found fascination in the opportunities created by the collaborativeness of open innovation and this seemingly new way of being innovative.

During research, we realized how important open innovation is in today's business landscape. However, when we immersed ourselves more within the subject, we noticed that there has been less emphasis on the challenges that come with open innovation, specifically for small- and medium-sized enterprises who work in different circumstances than larger enterprises. We have therefore decided to study how small and medium-sized enterprises (SMEs) in Sweden work with open innovation in order to overcome its challenges.

1.2 Problem background

“Not to innovate is to die”, famously quoted by Christopher Freeman in his study of the economics of innovation (Freeman, 1982, cited in Gawarzynska, 2010, p. 20), may never have been more applicable than in present times. Looking at the biggest companies of our generation as Apple, Google, Tesla, and Microsoft, it is not a difficult task to identify the common denominator: the ability to innovate (Gawarzynska, 2010, p. 20). Truth be told however, innovation is not just the foundation of success in today's competitive enterprise environment, it is a necessity for survival. As a result, the question nowadays does not focus on why it is important, but how innovation processes can be managed to maintain a strong economic growth in times where globalization of competition, financial challenges and demographic barriers are ever present (Gawarzynska, 2010, p. 12). By constantly aiming for improvements in regards to new customers, goods, markets, and methods, Schumpeter describes the innovation dimension as a “fundamental impulse that sets and keeps the capitalist engine in motion” (Schumpeter, 1934; Schumpeter, 1939; Schumpeter, 1942, cited in Gawarzynska, 2010, p. 10) arguing for it not only allowing for competitive advantages, but also being far more important than marginal changes in prices of existing products (Gawarzynska, 2010, p. 10).

In more recent studies, innovation has regained attention as a new perspective has been introduced. Historically, innovative success has been a result of internal R&D processes where solely companies with resources such as IBM, DuPont and AT&T could compete in their respective market in terms of generating profits (Chesbrough, 2003a, p. 35). This idea of “closed innovation” meant that any competitor who sought to challenge these powerhouses for market shares had to gather enormous resources and be willing to risk it if they were to have any chance of success (Chesbrough, 2003a, p. 35). As a response to this unfair game, newcomers conducted systems where little to no basic research was made on its own as they introduced new ideas to the market through different processes (Chesbrough, 2003a, p. 35). By commercializing internal and external ideas to the market, enterprises removed the boundaries between the firm and its outside environment to create an “Open innovation system” (Chesbrough, 2003a, p. 36-37) which led to increased “Time-to-market” speed, richer “Know-how” and greater market success (Greco et. al, 2019, p. 54-55).

Despite years of research, the small to medium enterprises (further referred to as SMEs) perspective still remains under-researched in the open innovation field even though they represent the largest group of companies in the economy (Gassman et. al, 2010, p. 219). Since SMEs operate under vastly different conditions compared to large sized enterprises, a crucial question to ask is how they can manage open innovation despite their lack of resources, especially in cases where the firm is dependent on a few numbers of customers (Gassman et. al, 2010, p. 219).

Prior research suggests however that even though SMEs face unique challenges in terms of engaging in open innovation, they can achieve greater benefits in comparison to larger enterprises. (Dubouloz et al., 2021, p. 113). As smaller firms tend to be more flexible, more willing to take on risks, less bureaucratic, quicker in both their decision-making process and reaction-time to market changes, the positive effect of an open innovation system could be of a greater scale (Dubouloz et al., 2021, p. 113). With this knowledge in hand, we therefore believe it is worth investigating open innovation in SMEs further.

To narrow the topic of open innovation down further, we decided to look at the open innovation environment of SMEs in Sweden. Sweden is in terms of innovation considered one of the most advanced countries worldwide, and in regard to technology and science indicators it always ranks high in international reports such as OECD and Eurostat (Chaminade et al., 2010, p. 2). As other small countries, the Swedish economy has a strong global orientation, which is reflected in the national innovation systems (NIS) as it is majorly represented by internationally oriented firms and universities (Chaminade et al., 2010, p. 4). The climate for open innovation in Sweden thus seems to differ from other economies, since its historically proven to be favorable, but may also infer other challenges compared to its peers. Sweden is also our country of origin, meaning we have connections here and prior experience of the local innovation landscape.

Lastly, the study is going to look at the companies’ open innovation work in terms of actions from the Meso-level (firm) perspective (Guzzo et al., 2020, p. 333). Since our pre-understanding and research solely have resulted in knowledge revolving around open innovation as a *concept*, we want to concretize the *practical process* of it. How do SMEs in Sweden operate to the best of their abilities to overcome the challenges of open innovation, not as a theoretical concept but in actions? By conducting a study investigating the practical actions of the firm, we therefore strive to address how the

challenges are overcome in real-life examples. We believe that awareness of the potential challenges, as well as how to overcome them, is crucial for Swedish SMEs that work with open innovation. Doing so, we aim to ensure that the Swedish innovation climate maintains its strong position and that SMEs keep generating successful innovations.

1.3 Research gap

As briefly presented earlier, the field of open innovation from the perspective of small to medium enterprises is claimed to be under-researched (Gassman et al., 2010, p. 219). Researchers Lee et al. (2010, p. 291) also argues that “a necessary focus for future research is the nature of innovation in SMEs, and the extent to which open innovation is embedded in such firms”. In addition, open innovation in SMEs will be different from that in larger firms since innovation processes differ between the two (Vossen, 1998, p. 88).

According to Radziwon & Bogers (2017, p. 28), their research on open innovation processes and practices could be complemented by a different level of research, suggesting another level of analysis in the open innovation business ecosystem. This is what we are planning to do in this study in the form of individual companies. The dimension of individual enterprises’ open innovation is, according to us, vastly important, and we therefore claim to have discovered a perspective to further define the research gap.

Furthermore, there seems to be a gap for investigating how firms overcome innovation barriers in general, with Hölzl & Janger (2012, p. 25) suggesting the need for more attention in this area. A more specific example of this is organizational and cultural issues which are key barriers of open innovation (van de Vrande et al., 2009, p. 423). Despite being an established barrier, research on how SMEs can overcome this major barrier is still needed (van de Vrande et al., 2009, p. 436).

Lastly we aim to put this research gap in the Swedish SME climate. Sweden has historically been considered one of the most advanced countries worldwide regarding innovation (Chaminade et. al 2010, p. 2), for which we argue that key actions can be discovered. Vrgovic et al. (2012, p. 293-294) mentions that the implementation of open innovation differs significantly from country to country, mentioning that developing countries for example need more government involvement. For this reason, we believe that our study will bring a new perspective in the form of a different country and is interesting and useful to complement the current research on open innovation in SMEs. This is further strengthened by Radziwon & Bogers (2017, p. 27) who argue for the lack of diversity among regions in open innovation research and the need for research in different countries. We therefore argue for the high relevance of further investigating the handling of barriers of open innovation, among the largest group of enterprises, in one of the world's leading economies in terms of innovation, on a practical level.

1.4 Research question

How do Swedish SMEs overcome the challenges of open innovation in practice?

1.5 Purpose

The purpose of this thesis is to further investigate how Swedish SMEs work with open innovation on a practical level to overcome the innovation barriers. By coming in contact with the people responsible for the innovation work of these companies, whether that is the CEO or R&D manager for example, we aim to gain insights of the specific actions taken in the innovative work. Since several studies have been made within the field of open innovation, we see good potential for combining prior empirical proven studies and concepts with new primary data. The primary data will be collected through a qualitative study in the form of interviews with the responsible people. The goal is to present a more nuanced perspective which can be useful for business owners, innovation consultants and managers in their work with open innovation in the context of small and medium-sized enterprises.

By assembling our findings from the qualitative study, we aim to further decrease the research gap regarding open innovation amongst SMEs but also to identify actions successful enterprises in the field have executed on a practical level. This contributes to the understanding of addressing challenges associated with open innovation, moving the literature from conceptual to a more practical manner.

At the end of this investigative study, we hope to have made conclusions and analysis that are useful for SMEs in Sweden, but also serve as a foundation for further research in the field.

1.6 Focus and delimitation

For this study we have decided to focus on Swedish SMEs that work with open innovation, with open innovation meaning the involvement of external parts in value-creating innovation work. The examined companies fall into classification of an SME according to the European Commission (2020). The perspective of this study will be from the view of a decision-maker that is heavily involved in the innovation work of these companies, meaning that we will not investigate how the company as a whole agrees with the decision-maker and their answers.

Open innovation involves several parts, where it's not unusual for private and public actors to collaborate. Despite the public sector possibly being involved in the innovation work of our examined organizations, the focus for this study lies in researching how private enterprises handle the barriers of open innovation. Whether any of our findings may be applicable for public actors is something for future research to conclude.

2. Scientific method

In this chapter we will explain our pre-understanding of the subject and argue for the choice of method for gathering relevant data. We will also describe our research paradigm and account for choosing a qualitative method.

2.1 Our pre-understanding of the subject

We, as the authors of this thesis, share a very similar academic background. Both of us will soon be completing a four-year degree in economics with the orientation of finance and management at Umeå School of Business, Economics and Statistics. The broad range of courses we have taken have improved our knowledge of economy as a whole and especially management which means that we feel comfortable writing a thesis on the subject. This has also given us academic knowledge meaning we can choose a relevant subject and analyze and draw conclusions based on relevant theories.

When it comes to innovation and the management of innovation, we have come across theories and concepts in our education and work, meaning that we have some pre-existing knowledge to build on when going more into depth. This existing knowledge helps us identify what is relevant and to be more source critical. The choice of focusing on innovation came naturally due to a common interest from us both. Narrowing down to focus on open innovation happened during the research process. Despite knowing about the concept prior to starting the thesis, learning more about it made us see how beneficial it is for companies and how it is yet not the standard way of working with innovation.

2.2 Paradigms

Knowledge can be perceived through different perspectives, two of them being epistemology and ontology. The two dimensions can be differentiated by its point of focus: ontology philosophizes about the *nature of reality*, while epistemology focuses on the philosophy of *what we can know* (Raadschelders, 2011, p. 918). We will further explain the two paradigms in the following sections.

2.2.1 Ontology

According to the philosophy of the ontological perspective, there is an ongoing discussion about how the nature of reality can be considered. The central question regarding nature is whether the social entities of it can be considered as objective, or as a subjective construction based on our existing social structures (Bryman & Bell, 2011, p. 20). These contradicting approaches can be referred to as objectivism and constructionism (Bryman & Bell, 2011, p. 20). Objectivism is the belief that social entities are objective and tangible meaning it is independent of the actors and observers (Bryman & Bell, 2011, p. 21). Constructionism opposes this view, suggesting that instead of objective, the social reality is created by people in the form of observations, perceptions and actions, and is therefore different for each individual (Saunders et al., 2019, p. 136).

As we aim to investigate the innovative work among businesses and plan on interviewing participants from leading positions, we believe it's impossible to consider their reality as objective. Since we cannot experience this proclaimed reality ourselves, our interpretation of it is solely a result of the answers to our predetermined questions. This means that the reality from which our data is collected is not only based on our own subjective understanding of it, but also on a reality that is described to us, originating from someone else's subjective understanding of it. The ontological position of our thesis therefore lies in the constructionist approach. This allows us to interpret the social nature of the open innovation environment of a business and how leaders within them perceive it. However, it is important to consider the subjective elements of our study and the connection to reality that our subjects possess.

2.2.2 Epistemology

Assuming it's a fact that every element of our social context is subjective, epistemology puts more emphasis on the doctrine of knowledge and the conditions for learning (Sohlberg & Sohlberg, 2016, s. 68-69). Epistemology is a philosophical learning field stationed in the understanding that all knowledge is based on sense impressions and credibility originating from experienced facts (Sohlberg & Sohlberg, 2016, s. 68-69). Researchers need to identify several epistemological assumptions in order to create an understanding of potential strengths and weaknesses in methods used to conduct the study (Saunders et al. 2019, p. 133-135). The two extremes when it comes to epistemological assumptions are the objective standpoint of positivism, and the subjective point of view of interpretivism (Marsh & Furlong. 2002, p.20). Between the two exist the philosophy of realism (Marsh & Furlong. 2002, p.20). These three epistemological positions differ from each other in the sense of to which extent they believe knowledge is objective and can exist independently from the actor and social constructions between actors (Marsh & Furlong. 2002, p.20).

Positivism claims nature exists independently from us (Marsh & Furlong. 2002, p.20), and its part of the research paradigm is based on ontology, a perspective where the social contextual reality is perceived as singular and detached (Collis & Hussey, 2014, p. 43-44). This infers a belief where the world is not affected by us exploring it, meaning it will stay the same both before and after studies have occurred (Collis & Hussey, 2014, p. 43-44). By researching social elements through observations and experiments, the researcher aims to address its research gap with quantitative data. (Collis & Hussey, 2014, p. 43-44).

Interpretivism on the other hand is based on a social science point of view and was created as a response to the rising criticism of positivism. (Collis & Hussey, 2014, p. 44-45). This process is on the contrary to positivism a perspective where the understanding of our reality is subjective, meaning the researcher is a part of the study and that its findings will be embossed by personal beliefs and values (Collis & Hussey, 2014, p. 44-45). The world can not be seen other than through the eyes of the spectator, and therefore the knowledge provided historically and present will always be biased (Collis & Hussey, 2014, p. 44-45).

In the middle of the objective and subjective frame lies critical realism (Saunders et al. 2019, p.147). By explaining what we see and experience via underlying structures that impact the observed subject, critical realism answers the criticism of positivism by seeing reality as independent, but simultaneously accepting that the only access to it is through observations through subjective minds (Saunders et al. 2019, p. 147). Therefore, it combines the subjective dimensions of individuals with the aspect of an objective world, aiming to create a more nuanced picture through subjective filtered observations of our nature.

This research will be executed from an interpretivist point of view, as it will gather qualitative data through interviews with people at companies who actively engage in open innovation and their subjective understanding of its nature. These findings will later on provide a base for our conclusion, which also will be subjective since the information will be processed directly by us. Therefore, in correlation with the interpretivist approach, our prior experience, beliefs, and values will play a role in the findings of the study. In addition to this, we believe a subjective conclusion is necessary since respondents likely will contribute with different perspectives and arguments based on their subjective understanding of the research field. This infers a reality of more than one truth, hence

why we intend to give the reader the opportunity to create its own based on our research. Lastly, the interview method is a constant for questions and follow up questions, meaning the information available to the reader is limited to what the researcher asks. Because of this, the result will be subjective rather than objective.

2.3 Approach

Based on the extent to which the study intends to test a theory or building one gives the researcher different alternative approaches to the study. Two main approaches for a research are the inductive and deductive reasoning. These determine the starting point of the research and its methodical process, which in turn acts as a presenter of the logic used to link theory and research together (Bryman & Bell, 2011, p. 11)

Deductive approach means that the researcher formulates a hypothesis and studies the correctness of its claims in reality by comparing empirical observations with existing data. The approach is considered conceptual and theoretical structured (Collis & Hussey, 2014, p. 7). Saunders et al. (2019 p. 153-154) further emphasize important aspects of deduction which separates it from induction: a clearly specified hypothesis, a set of concepts that are operationalized in a manner that makes them researchable (often quantitatively), precise variables avoiding misleading measurements, and a sample size that are appropriate in size and formation. Together, these aspects of deduction generates a approach for which the purpose of clearly theorizing before researching can be achieved (Saunders et al., 2019, p. 153-154; Bryman & Bell, 2011, p. 11-13; May, 1998, p. 30)

Inductive research on the other hand originates from the opposite side of the spectra, where theories are generated by collecting data rather than forming and testing a theory (Saunders et al., 2019, p. 154-155; Bryman & Bell, 2011, p. 11-13). Induction can be further explained as the act of examining an aspect of our social environment and gathering data for presenting explanatory theories emerging from it (May, 1998, p. 30-31). This sort of research suits a smaller sample size better than bigger ones as it implies an understanding of the connection to the context evolving the subject (Saunders et al. 2019, p. 155).

If the researcher combines the two approaches, creating a compromise between the deductive and inductive methods, they may find themselves in a abduction approach. This third approach begins with a fact or known piece of information and shapes a concluding result of how the situation could have happened (Saunders et al., 2019, p. 155). It's a process of continuously switching between deduction and induction where data is collected, shaping a set of themes and finally sets a foundation for testing the theories further (Suddaby, 2006, p. 639). A researcher may hence work inductively to test theories in a new case and then use a deductive method to extend the theories further. Abduction can therefore be considered as building and developing theories that can explain a certain situation or problem faced (Blaikie, 2009, p. 90-92).

The thesis will be based on the inductive approach as our study aims to create a conclusion by translating data we collect from reality, rather than testing hypotheses. Real world expertise and experiences will be analyzed and summarized with the target of explaining the reality of overcoming challenges tied to open innovation work. In addition, the study will be conducted in the form of interviews with a small sample size of the population, emphasizing the importance of the context of the gathered data, for which an inductive study suits well as mentioned before. However, since the elements of our interview guide

is based on existing literature to make sure the collected data is relevant for our topic, one can argue we adopt a deductive approach as well. Since we allow the respondents to comment on their perceived validity of the presented challenges, it is possible to claim that the underlying theories of the presented challenges are tested in a sense. This would argue for us using an abductive approach where we use both deductive and inductive elements. With that being said, the validation of the challenges in our interview is solely a foundation for us to ask follow-up questions (as these questions would be irrelevant otherwise) and is not directly connected to our research question. For that reason, we argue that the method used in this study remains inductive.

2.4 Research design

Research design is the general orientation when conducting a business research (Bryman & Bell, 2011, p. 26), and is connected to the philosophical position of the researcher. There are three commonly used research designs: quantitative, qualitative and mixed-method approach. A researcher with an objectivistic and positivistic approach will probably rely on the theory-testing originating from a deductive perspective. Testing a theory requires measurements and hypotheses of the research subject (Bryman & Bell, 2011, p. 27), which naturally would infer a quantitative approach. On the contrary, a researcher with the purpose of building theories may find the qualitative approach as it emphasizes the interpretation of the social world of the respondents rather than statistical relationships with data (Bryman & Bell, 2011, p. 27). Naturally, the mixed method is a combination of the two, using both quantitative and qualitative data to examine hypothesis as well as considering the context of the studied subject (Bryman & Bell, 2011, p. 28)

In addition to research design, the research purpose can be separated into different categories. The four main categories used are exploratory, descriptive, explanatory, evaluative or any combination of them (Saunders et al., 2019, p. 174). Exploratory studies use open questions to explore events and gain insight of a certain topic, while descriptive research aims to present a precise picture by asking questions such as who, what and when (Saunders et al., 2019, p. 187). Evaluating studies explore whether how well something works, for example technical innovations or reinvented processes (Saunders et al. 2019, p. 187).

Finally, the conducted research is affected by its timeline, meaning the researcher may look either at a given point in time or observe the subject over a time period. These methods are called cross-sectional studies (Bryman & Bell, 2011, p. 54) and longitudinal studies (Bryman & Bell, 2011, p. 57). As the name implies, the main difference between the two is the time frame for which data is collected, whether it is a single event in time or on several occasions.

In our case, we will base our study on the qualitative method as we strive to interpret the social world of the respondents. This allows us to ask open questions, emphasizing the opportunity to further explore our topic through an exploratory approach. But, since the main part of our thesis purpose is to explore how Swedish SMEs overcome the barriers of open innovation, we also aim to gain detailed descriptions from our interviewees. Our study therefore consists of both an exploratory part, where we openly explore in what way a certain challenge is perceived by the respondent, and later on a descriptive part where the interviewee gets the chance to explain their work in overcoming these on a practical level. This data collection will then be executed at a single point in time,

meaning we are not considering how certain actions taken by a respondent for overcoming an innovation barrier changes over time, but a historical reflection of patterns and themes.

2.5 Summary of scientific method

As the fundamental parts of constructing a methodology now have been presented, we will summarize our chosen methods and approaches. Firstly, as we claim the data collected is based on a subjective reality, our initial approach is through a constructional ontological perspective. The findings will then be analyzed through qualitative data from a smaller sample size where the context of our subjects are important, claiming for an interpretivist point of view as well as an inductive approach when constructing a conclusion of the interviews. Furthermore, the purpose is to further explore the topic through an exploratory research design consisting of open questions and improvised follow-ups. A hint of descriptive elements may also occur as it contributes to the overall context. Finally, the collection of data will occur at a single point of time, meaning we will and can not comment on how said findings have changed over time. With this overall approach we strive to further investigate the topic of overcoming barriers in open innovation activities among Swedish SMEs.

3. Theoretical framework

3.1 Innovation

3.1.1 Defining innovation

There are many definitions of innovation. Despite authors disagreeing slightly about the exact definition of innovation, one common view is presented by van de Ven (1986, p. 591) as “the development and implementation of new ideas by people who over time engage in transactions with others within an institutional context”. The theory of innovation can be related to Schumpeter’s theory of economic development, which states that “economic development is driven by the discontinuous emergence of new combinations (innovations) that are economically more viable than the old way of doing things” (Schumpeter, 1934, cited in Drejer, 2004, p. 556). Schumpeter argued that the existence of innovation is a necessity and that there are five major forms of innovation; (1) the introduction of a new good or of a new quality of good, (2) the introduction of a new production method, (3) the opening of a new market, (4) a new source of supply of raw materials or half-manufactured goods, (5) or the carrying out of the new organization of any industry (Schumpeter, 1934, p. 66). Schumpeter laid the groundwork and the different types of innovation look similar today. According to OECD (2010), there are three ways to categorize innovation; product, process, and organizational innovation. Product innovation refers to a new or improved product or service being introduced to the market, process innovation concerns improved methods of production, and organizational innovation is about the improvement of management of resources and routines (Rosenbusch et al., 2011; Tavassoli & Karlsson, 2016; Goedhuys & Veugelers 2012; Polder et al., 2010, cited in Expósito & Sanchis-Llopis, 2019, p. 116).

3.1.2 Why innovation is important

The relevance of innovation in organizations is clear. Companies such as Apple, Toyota, Google, and Starbucks are all heavily investing in innovation with great success (Beckman & Barry, 2007, p. 25). Skarzynski & Gibson (2008, p. 12) argue that if companies want to grow sustainably in today's fast paced, competitive markets, they have to innovate in their products, services and processes. Firms that adopt an innovation strategy can become more efficient (Crumpton, 2012, p. 98), become more adaptive through the implementation of new ideas (Thompson, 1965, p. 2), and are more competitive (Dobni, 2008, p. 43). Innovative companies are the ones that survive and thrive in today's environment, with the competition that struggles with innovation often being reduced to a state of irrelevancy (Kim & Mauborgne, 2014, p. 2). Research on the importance of innovation for economic growth, productivity and sustainability stretches far back in time. Schumpeter emphasized the importance of innovation as early as 1911 in the first edition of Theory of Economic Development.

Furthermore, Camison & Villar-Lopez (2014, p. 2892) pin-points the importance of organizational innovation as it leads to increased firm performance and generates new methods and resources within the enterprises. Engaging in innovative projects creates a ripple effect, influencing new ideas and projects as a result of the innovative nature and outcomes it generates (Camisón & Villar-López, 2014; Damanpour & Evan, 1984; Evangelista & Vezzani, 2010; OECD/Eurostat, 2005).

Regardless of the aim of the innovation, there are two strategic ways of achieving the goals of the project: Through closed or open innovation. Closed innovation is the traditional approach of using a vertical model where internal research and development activities lead to internally developed products which later on is distributed by the firm (Chesbrough, 2006, p. 2). Open innovation on the other hand is an intentional use of out and inflows of knowledge to promote internal innovation, and expand the markets of external use for innovation (Chesbrough, 2006, p. 2-3). In the following sections, we will explain the two strategies further in depth, discussing its challenges and benefits as well as contextualizing them in the environment of Swedish SMEs.

3.2 Closed innovation

3.2.1 Defining closed innovation

In order to describe open innovation, it is natural to first describe its counterpart, closed innovation. When working with closed innovation, the organization keeps its innovation entirely in-house. An organization that works with closed innovation generates, develops, commercializes its ideas, all within the company (Chesbrough, 2003a, p. 36-37). The closed innovation model is based on the philosophy that innovation requires control and should not be assigned to external parts (Chesbrough, 2003a, p. 36).

3.2.2 Benefits of closed innovation

In terms of benefits of closed innovation, Almiral and Casadesus-Masanell (2010, p. 28) argues for one main reason for when closed innovation is superior to open. This is when *Divergence* occurs. Divergence is the effect of innovation systems being opened to outside suppliers and complementors, inferring that choices regarding the original innovation process are being undertaken by external independent actors (Almiral & Casadesus-Masanell, 2010, p. 28). This is the loss of freedom as an effect of opening up

the process, for which retaining is a costly process as suppliers and complementors are likely to maximize their own payoffs, not accounting for the original innovation initiative taker (Almiral & Casadesus-Masanell, 2010, p. 27). Even though there are positive correlations between the interests of different actors, goals will generally not be perfectly aligned with each other (Almiral & Casadesus-Masanell, 2010, p. 28). This scenario can be avoided when facilitating a closed approach to innovation (Almiral & Casadesus-Masanell, 2010, p. 28).

Another academic source we found provides an example of a company that benefited from a closed innovation strategy in Samsung. Samsung achieved success in the global smartphone market through continuous investments in internal R&D and differentiation from other companies (Yun et al., 2018, p. 11). They used vertical integration to accumulate excellent technical capabilities, thereby differentiating themselves from their competitors (Yun et al., 2018, p. 12). Current and former employees, as well as reporters and experts have come out and identified internal R&D and internal innovation capacity accumulation as the main success factors for Samsung's success in the field of smartphones (Yun et al., 2018, p. 12). Another source found that closed innovation strategy is beneficial for companies defending their market segment where it is necessary to continuously invest in internal R&D (Bader & Enkel, 2014, p. 172).

Lastly, Christensen et al. (2005, p. 1546) argues that some innovation projects require traditional closed innovation activities if the outcome of the project is critical for the firm's competitive advantage. Enterprises may also turn to closed innovation if the risk of leaking vital knowledge is too high, if no partners with the right competencies are available, or if the project is too complex to be managed by an open innovation system (Almiral & Casadesus-Masanell, 2010, p. 36). In these scenarios, firms may benefit from and require traditional hierarchical and formalized processes typical of a standalone company (Almiral & Casadesus-Masanell, 2010, p. 36).

3.2.3 Challenges of closed innovation

Because it worked, this philosophy, of what is now called closed innovation, was for years considered the norm for working with innovation. However, in the 20th century, companies could not easily keep new ideas within the company anymore. A likely cause of this is the large increase in the number and mobility of knowledge workers (Chesbrough, 2003a, p. 36). If an idea was discovered within the company and not acted on in time, the involved people could take the idea elsewhere in the form of a startup for example. If a company can not gate keep and commercialize all of their good ideas, there is no point in using a closed innovation model (Chesbrough, 2003a, p. 36).

When working with closed innovation, firms' experience spillovers when conducting internal R&D work, which these firms according to Chesbrough (2006, cited in van de Vrande et al., 2009, p. 425) deem as "a regrettable but necessary cost of R&D". Closed innovation requires firms to be strongly self-reliant, having to generate their own ideas as well as developing and distributing them (Chesbrough, 2003b, cited in van de Vrande et al., 2009, p. 425). However, because of labor mobility, venture capital and widespread knowledge across multiple public and private organizations, it is now too expensive for companies to innovate on their own (Chesbrough, 2003b, cited in van de Vrande et al., 2009, p. 426). In fact, the starting point of openness is the view of how one single organization is unable to innovate when isolated from external parties (Chesbrough, 2003a; Laursen and Salter, 2006a, cited in Dahlander & Gann, 2010, p. 699). The

organization has to collaborate with other types of partners to receive ideas and resources from the external environment to stay ahead of its competition (Chesbrough, 2003a; Laursen and Salter, 2006a, cited in Dahlander & Gann, 2010, p. 700). As a consequence, it is a major challenge for enterprises facilitating closed innovation to reach the same level of efficiency as open innovation.

Finally, as firms maintain an increasing amount of knowledge from outside of its boundaries over time as a result of open innovation, this points to an interorganizational relationship acting as an extension of the firm's internal knowledge base (Grant & Baden-Fuller, 2004, p. 79). To interpret, a firm may therefore receive a greater amount of knowledge when opening up its innovation process. If a business strictly wants to maintain a closed innovation strategy, it puts more emphasis on the level of competency within the organization. It hence becomes a challenge for firms with a closed innovation approach to accumulate and maintain a corresponding amount of knowledge received by an open innovation strategy.

3.3 Open innovation

3.3.1 Defining open innovation

Open innovation is a model where organizations commercialize both their own and external ideas. Chesbrough's (2006, p. 1) definition of open innovation reads: "*The use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively.*" What he means by this is that, in order to advance their technology, firms should combine the use of internal and external ideas, as well as internal and external pathways to the market (Chesbrough, 2006, p. 1). Open innovation means that firms can gather ideas from external parts and use them to create systems of value. It also means that firms' ideas generated internally can be taken outside of the limits of the company to create value through external channels.

In comparison to the closed innovation model, open innovation is built on a culture of knowledge sharing. The distinction between the organization and its environment becomes more subtle, making the flow of innovation in and out of the company easier (Chesbrough, 2003a, p. 37). There are three different types of processes that can be differentiated in open innovation, the outside-in process, the inside-out process, and the coupled process (Enkel et al., 2009, p. 312).

The outside-in process of open innovation

The outside-in process focuses on improving the company's knowledge through the integration of external parts such as suppliers and customers in order to increase their innovativeness (Laursen & Salter, 2006; Lettl et al., 2006; Piller & Walcher, 2006, cited in Enkel et al., 2009, p. 312). A study by Enkel & Gassman (2008, cited in Enkel et al., 2009, p. 312) reveals that the biggest knowledge sources for companies were clients, suppliers, competitors and public and commercial research institutions.

The inside-out process of open innovation

The inside-out process refers to bringing internal ideas to the outside environment and making a profit from it (Enkel et al., 2009, p. 312). This can be done through selling

intellectual property and/or multiplying technology to transfer the knowledge outside of the company's boundaries (Enkel et al., 2009, p. 312). The firm profits from this by gaining access to different markets and thereby an increased and differentiated source of income (Gassmann & Enkel, 2004; Lichtenthaler & Ernst, 2007, cited in Enkel et al., 2009, p. 312-313). This process is more frequently used in large companies, from comparisons made of different company sizes, it is clear that only large multinationals tend to have an active out-licensing strategy (Enkel et al., 2009, p. 313).

The coupled process of open innovation

The coupled process involves forming alliances and joint ventures with other companies and co-creating (Enkel et al., 2009, p. 313). The companies that form these alliances and utilize the coupled process make use of both the outside-in process to access knowledge from their partners, and the inside-out process to bring external ideas to different markets (Enkel et al., 2009, p. 313). It can therefore be seen as a combination of the two previous processes and is built on the idea that a give and take relationship is crucial for a successful innovation process (Enkel et al., 2009, p. 313). The coupled process is widely used among all company sizes and is especially popular in the electrical, electronic, IT, and other high-tech industries (Enkel & Gassman, 2008, cited in Enkel et al., 2009, p. 313).

3.3.2 Benefits of open innovation

A major benefit of open innovation is that it opens up opportunities that are missed in an organization that is too internally focused, for example ones missed because they lie outside their scope of attention, or must be combined with technology that the organization does not possess (Chesbrough, 2003a, p. 37). In a closed innovation system, research projects are launched from the science and technology base of the firm (Chesbrough, 2006, p. 2). Thereafter, the ideas pass through a closed process where some projects are deemed inadequate and stopped, while others are developed enough to go to the market (Chesbrough, 2006, p. 2). This process is closed because projects can only enter one way and exit one way. The open innovation model, however, new projects can enter the innovation process at any stage (Chesbrough, 2006, p. 2). They can also come from both internal and external sources, and enter the market in other ways than just the company's sales channels, such as to new markets and to other firm's markets through licensing (Chesbrough, 2006, p. 2). This can counteract being too internally focused and allow firm's to make use of all their valuable ideas, regardless of internal capabilities. By leveraging multiple channels and reaching new markets outside of the firm's traditional development process, they can create additional streams of revenue (Rohrbeck et al., 2009, p. 425).

There are several studies that the open innovation model brings benefits. In studies by Ghezzi et al. (2018, p. 29) and Rehman et al. (2018, p. 79), they argue that firms can become more cost efficient by innovating collaboratively across industries to decrease R&D costs. Other benefits include accelerated knowledge acquisition, integration, and accumulation of external knowledge through tools that improve the collaborators absorptive capacity (Wan & Quan, 2014; Alberti & Pizzurno 2017; Garcia Martinez et al. 2017; Usman and Vanhaverbeke 2017, cited in Oumlil et al., 2020, p. 20). Open innovation can also be considered a win-win situation in terms of value creation. Including both external and internal actors in the development process of products and services guarantees value creation for both the organization and its collaborators (Ghezzi

et al., 2016; Herskovits et al., 2013; Piyathasanan et al., 2018, cited in Oumlil et al., 2020, p. 20).

An example of a company who benefits from open innovation is Procter & Gamble. They have created a strategy called “Connect and Develop” which focuses on taking in input from external parts (Dodgson et al., 2006, p. 333). This strategy embraces several aspects of the open innovation concept and is a way that Procter & Gamble is able to involve suppliers, customers and other external parts in their innovation work (Dodgson et al., 2006, p. 338). By doing this, Procter & Gamble have improved their ability to access external technology and competence (Dodgson et al., 2006, p. 338)

3.3.3 Challenges of open innovation

West & Gallagher (2006, p. 320-321) divides the challenges mainly talked about in relation to open innovation into three groups; maximization of returns, incorporation of external innovations, and motivation of organizations.

The first group is the concern over how to use internal innovation capabilities to maximize returns (West & Gallagher, 2006, p. 321). Internal innovation for example includes innovations to be internally commercialized, externally commercialized through patents etc., or that help the absorptive capacity in order to more easily identify external innovations (West & Gallagher, 2006, p. 321). The many uses of maximizing return to internal innovation are often combined, with an example being Intel who establishes research labs near elite university research groups to build absorptive capacity and identify external innovations. When a promising innovation is identified, Intel recruits top academic researchers to help internalize the innovation and facilitate its production (West & Gallagher, 2006, p. 321).

The second group is the incorporation of external innovations, meaning that organizations not only need to identify and understand them, but also capitalize on it in order to produce a product or service (West & Gallagher, 2006, p. 321). This has proved to be a problem due to “not invented here”-syndrome. It can be defined as “an individual’s negative attitude towards knowledge that originates from a different field of expertise, from another organizational entity, or from another geography, and thus, is considered ‘outside’ or ‘external’ to the group(s) or organization(s), in which the individual is embedded” (Antons & Piller, 2015, cited in Hannen et al., 2019, p. 2). This makes people more inclined to reject external knowledge even though it might be beneficial for the organization (Hannen et al., 2019, p. 2). In addition, studies have shown that the task of identifying relevant external knowledge and making it available to everyone in the firm creates a set of managerial challenges (Salter et al., 2014, cited in Bagherzadeh et al., 2021, p. 304). Because of this, implementing appropriate internal practices are needed (Salter et al., 2014, cited in Bagherzadeh et al., 2021, p. 304). Furthermore, R&D employees should not only be allocated, but set off time for innovation within or/and outside the enterprise (Bagherzadeh et al., 2021, p. 312), advocating for additional managerial challenges.

The third group of problems is the one of motivating organizations partaking in an ecosystem of open innovation to produce spillovers (West & Gallagher, 2006, p. 321). “Free-rider”-problems occur when everyone wants to capitalize on external innovations

without producing any spillovers themselves (West & Gallagher, 2006, p. 321). The employees also have to be motivated to be involved in the innovation work (Bogers & Horst, 2014, p. 746). Another challenge is for organizations to motivate employees to step outside their comfort zones and connect with new external partners. It is common for companies to get stuck in the comfort of their long-term partnerships which has its benefits, but also limits the organization's ability of finding new perspectives and ways of working (Salter et al., 2014, p. 81).

3.4 Small and medium-sized enterprises

Definition

The European Commission's definition of small and medium-sized enterprises (SMEs) is as follows (European Commission, 2020, p. 43):

“The category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million.”

Ghobadian and Gallear (1997) provides another definition of SMEs in which they use the comparison to larger enterprises. SMEs tend to be less bureaucratic and therefore they generally have a flatter structure than larger organizations (Ghobadian & Gallear (1997, p. 87). Due to their size, SMEs do not need strict formalization and standardization in order to be coordinated, and are therefore more innovative and flexible (Ghobadian & Gallear (1997, p. 87). SMEs are a driver of the European economy, creating jobs and economic growth with 21 million SMEs providing 88.8 million jobs in the EU 2013 (European Commission, 2020, p. 3). In Sweden, SMEs play a major role in the non-financial business economy, generating 61.2% of value added and 65.2% of employment in 2018 (European Commission, 2019, p. 3). This study will use the European Commission's definition of SMEs.

3.5 Open innovation in SMEs

The closed innovation model requires firms to be strongly reliant on their own R&D-capabilities in order to generate new innovations (van de Vrande et al., 2009, p. 425). On the contrary, open innovation models give enterprises the opportunity to draw from both external and internal paths to develop innovations and reach the market (Chesbrough, 2003, cited in van de Vrande et al., 2009, p. 424). By doing so, this model favors smaller firms and gives them an increasingly prominent position in the innovation landscape (Chesbrough, 2003, cited in van de Vrande et al., 2009, p. 427). In the following sections we will further explain the benefits and challenges of open innovation for SMEs.

3.5.1 Benefits of open innovation in SMEs

In addition to the general benefits of open innovation already mentioned in 3.3.2, SMEs can benefit from the open model further. Because SMEs are limited by a lack of financial resources, manpower, and substitutes for lack of sales, they especially benefit from

collaboration with external parts to increase innovation performance (Hanna & Walsh, 2002; Kaufmann & Tödtling, 2002). Open innovation also has a positive effect on the launching of new offerings for SMEs, and they receive great economic benefits from new products/services generated through open innovation (Spithoven et al., 2013, p. 556).

SMEs seem to reap the benefits of open innovation similarly to larger firms, with some exceptions like being less effective in generating new products and services through OI and benefitting less from search strategies to generate innovative turnover (Spithoven et al., 2013, p. 556). Despite SMEs being less effective than large organizations in generating new products and services through open innovation, they benefit more from the use of protection mechanisms related to their open innovation work (Pisano & Teece, 2007, cited in Spithoven et al., 2013 p. 556). SMEs can increase their share of new products and services in the total turnover through protection of intellectual property compared to larger enterprises, suggesting that SMEs are more efficient in identifying innovations with market potential (Spithoven et al., 2013 p. 556).

In terms of getting started with open innovation, SMEs naturally use external means of innovation to a greater extent compared to large firms, as they use networks and alliances as tools for extending their competencies (Edwards et al., 2005; Rothwell, 1991, cited in Lee et al., 2010, p. 290). This means that SMEs already have an external focus by heart and that the concept of collaborating is not new to them (Lee et al., 2010, p. 290). Lee et al (2010, p. 290) further claims that it is nearly impossible for SMEs to have a full set of competencies, funding, and distribution channels, meaning their commercializing abilities are usually limited. If SMEs work together to overcome these challenges, they can commercialize competitively and make more use of their business advantage (Lee et al., 2010. p. 298). In addition, collaboration with partners increases the probability of SMEs being able to launch new products and services, which is not the case in large enterprises (Spithoven et al., 2013, p. 556). Lastly, using external resources is also a tool for SMEs to shorten the innovation time, reduce risk and cost, and increase the flexibility of the operation (Hagedoorn, 1993, cited in Lee et al., 2010, p. 291).

3.5.2 Challenges of open innovation for SMEs

We have decided to divide the barriers of open innovation for SMEs into two categories: internal and external barriers. The reason for this is to make the results and the interviews clearer. Even though some barriers are connected, they can still be categorized as more internal or external. Knowing whether a barrier is internal or external will also help determine the appropriate course of action to overcome or avoid such barriers. This categorization is common in existing literature and is for example supported by Dubolouz et al. (2021) who argues for distinction between and categorization by internal and external barriers.

Internal barriers

Our pre-research of the topic led us to numerous sources addressing the known internal challenges when facilitating open innovation in a SME. We have concluded our findings from the articles into three categories: Culture, Lack of resources, and Administration and Coordination.

Culture

A study conducted by van de Vrande et al. (2009) collected data from a large sample of Dutch companies addressing the challenges in SMEs adopting open innovation. The

study showed that organization and corporate culture-related problems that occurred when two or more companies engaged in a collaboration was the most important barrier by far (van de Vrande et al. 2009, p. 433). When a company is venturing, participating or in other ways involving themselves with external partners and users, organizational and cultural barriers are more prominent (van de Vrande et al. 2009, p. 427). Mortara & Minshall (2011, p. 587) explained how one possible reason for such is the “Not invented here” (NIH) syndrome. They claimed how a NIH syndrome is the hostile view of external ideas and information, where this attitude against adopting outward inputs is said to be the most significant threat for implementing a successful open innovation system (Mortara & Minshall, 2011, p. 587). As a result, companies will seek out to engage in partnerships with enterprises who share the same social values as themselves, as this mechanism is proven to be a fundamental part of establishing a connection amongst partners and creating a common understanding of goals and vision. (Dubouloz et al., 2021, p. 128-129). However, the resistance it causes towards inbound, outbound, or coupled knowledge flows involving external parts with differentiated values from individuals or organizations infers a suboptimal use of open innovation (Dubouloz et al., 2021, p. 114). This behavior, referred to as a “Tribe Syndrome” (Dubouloz et al., 2021, p. 114), is also an external barrier which we will explain further later, but is initially created internally.

Organization and corporate culture-related barriers is also an issue causing practical implications as enterprises engage in different open innovation activities (van de Vrande et al. 2009, p. 433). As collaboration between different organizations infers internal divisions and employees to cooperate with external corresponding roles, this interorganizational relationship causes problems in terms of who is responsible for certain tasks, the balance between day-to-day business and innovation, and communication between organizations (van de Vrande et al. 2009, p. 433). In addition to this, SMEs may experience open innovation barriers when relying too much on its employees and not involving other stakeholders such as suppliers or customers to the same extent. The employees usually do not possess the required capabilities or motivation to make valuable contributions to the innovation process, which in the end leads to management not taking up any ideas generated by employees (van de Vrande et al. 2009, p. 434). This causes a negative attitude within the innovative culture and poses new challenges for managers to spark the creativity amongst the individuals (van de Vrande et al. 2009, p. 434)

Lack of resources

A lack of financial resources is another frequently experienced barrier and the common reason for early termination of innovative processes (Dubouloz et al., 2021, p. 121). During our research, we have identified three main areas of resources for which SMEs claim its shortage is a common issue: Financial resources, Knowledge and Expertise, and Time. The lack of financial resources is especially noticeable when SMEs engage in collaboration with larger enterprises (Dubouloz et al., 2021, p. 121). Finding partnerships to involve in the open innovation system therefore becomes an aggravated task, since the lack of a big budget infers a loss of credibility in the eyes of potential partnerships (Dubouloz et al., 2021, p. 121). Even in situations where firms manage to find partners, they sometimes do not have the financial resources needed to carry out the project (Dubouloz et al., 2021, p. 121). This was also discovered to be the case in a study conducted by Lee et al. (2010, p. 299) where findings showed lack of sufficient funds in production, operational and R&D areas halt the progress of the collaboration despite its joint venture with members of the open innovation system. The lack of financial resources

therefore causes a difficulty in achieving set goals for the R&D project, leading to goals and objectives needing to be redefined during the course of the project (Bertello et al., 2021, p. 97). As setting objectives then continuously undergoes redefining, it causes slowdowns and inefficiency of the project, sometimes inferring the project leader limiting itself to ensure every partner meets their minimum requirements for receiving funds rather than focusing on joint value creation (Bertello et al., 2021, p. 98). Furthermore, gathering vital information about potential partners is also an experienced problem (Julien, 2002, cited in Lee et al., 2010, p. 293). In comparison to larger firms with greater financial resources who have the opportunity to use professional intelligence processes for scanning and monitoring their environment, SMEs are limited in this area (Lichtenthaler, 2003, cited in Lee et al., 2010, p. 293).

Similar to financial resources, the lack of time is a persistent barrier (Dubouloz et al., 2021, p. 121). This barrier is both a challenge for the SME, but also for its collaborative partners, as the lack of time infers a forced innovative process as participants aim to carry out the project rapidly in hope of generating a quick positive return of its investments (Dubouloz et al., 2021, p. 121). This leads to a paradox for SMEs: the relationships between its open innovation system and intellectual properties (Brem et al. 2017, p. 1286). On one side, enterprises need to consider using satisfactory protection of knowledge before engaging in open innovation projects to avoid any sensitive information spillage, but on the contrary, SMEs have a very limited defensibility of these rights due to its high cost and time excessiveness (Brem et al. 2017, p. 1286). Even if intellectual properties were to be protected by legal defense, competitors may bypass it through loopholes (Brem et al. 2017, p. 1286). Establishing a balance of the two is therefore an important aspect when managing company strategies and the access to knowledge, which infers a careful analysis of the current situations in terms of informational assets and potential spillage (Laursen and Salter, 2004, p. 1202).

Finally, the technical dimension of engaging in open innovation systems are harmed by the lack of expertise and skills (Dubouloz et al., 2021, p. 119). A study of the Korean association for facilitating collaboration between Korean SMEs, KICMS, showed it is impossible for SMEs to have a complete set of expertise in technology (Lee et al. 2021, p. 298). As technology is becoming so complex that one firm cannot handle it on its own, and that relevant information is fragmented across various firms, collaboration between enterprises is a vital factor for success (Lee et al. 2021, p. 299). The study of KICMS showed that networks consisting of SMEs with special expertise in different fields who made genuine effort to trust creation, information networking, procedural learning and know-how transfer were likely to become successful collaborations (Lee et al. 2021, p. 298). However, in such scenarios, SMEs may struggle to understand each other (Dubouloz et al., 2021, p. 121). For example, in a study conducted by Dubouloz et al. (2021, p. 121), the company NetSoft Marketing had a difficult time explaining their customer needs to a partnered laboratory. When the laboratory later on presented their work to the NetSoft employees, they struggled to understand what the lab had developed. Adding the fact that too many sources of external knowledge for innovative activities may generate negative results, organizing networks of knowledge flows needs to be done with consideration (Lee et al. 2021, p. 298).

Administration and coordination

Administrative burdens are another important challenge (Bertello et al. 2021, p. 91). As SMEs engage in open innovation in terms of venturing, participation with other firms,

involvement of external parties, and cooperating with governments or non-profit organizations, pressure is being put on the administrative side of the process (Bertello et al. 2021, p. 91), as managers and owners of SMEs typically have a background of particular technological skills more often than as an executive (Torchia & Calabro, 2019, p. 207). The lack of experience and sometimes interest infers a knowledge-gap of modern management methods, meaning implementation and coordination occasionally might be tough tasks to execute in SMEs (Torchia & Calabro, 2019, p. 207). In addition, inter-organizational projects are often coordinated by the logics used by large companies rather than for SMEs, resulting in a tendency where SMEs occupy weaker network positions and depend on partners' strategies instead of controlling its own direction and efforts in open innovation (Dodourova and Bevis, 2014, p. 4).

Facing the tough task of managing complex multilateral relationships as a consequence of the lacking managerial capabilities, it may infer a need for intermediary agents (Malik & Wei, 2011, cited in Torchia & Calabro, 2019, p. 215). Intermediary agents make up for the lacking capacities and by coordinating and controlling information and other external resources to help SMEs set up competencies and follow-through with their innovative projects (Torchia & Calabro, 2019, p. 210). The need of a structural approach by intermediary agents is further argued for since open innovation risk to increase the time-to-market if SMEs fail to manage and coordinate its collaborations correct (Kessler et al., 2007, cited in Torchia & Calabro, 2019, p. 208).

Summary of internal barriers

Table 1 below summarizes the internal barriers that SMEs experience regarding open innovation. The categories of barriers are accompanied by keywords that summarize the key points mentioned in the text above. When it comes to culture, key points are related to the organizational culture, attitudes, and stakeholders. For resources, the focus was on financials, time, and knowledge and expertise. Finally, administration and coordination focused on the administrative burdens and the difficulties in coordinating collaborations.

(Table 1. Internal barriers of open innovation for SMEs)

Internal Barriers of open innovation for SMEs	
<i>Category</i>	<i>Keywords</i>
Culture	Organizational culture, attitudes, stakeholders
Resources	Financial, time, knowledge and expertise
Administration and coordination	Administrative burdens, coordinating collaborations

External barriers

Our pre-research of the topic led us to numerous sources addressing the known external challenges when facilitating open innovation in a SME. We have concluded our findings from the articles into two categories: Finding partners and working with partners.

Finding partners

According to Dubouloz et al. (2021, p. 123), the most prevalent challenge among the SMEs was difficulties in finding partners. Tribe syndrome is according to Dubouloz et al. (2021, p. 123), a major barrier in finding partners for collaboration. SMEs tend to have an affinity for organizations that share the same values, such as values of solidarity, decisional transparency, and respect for the environment (Dubouloz et al., 2021, p. 123). If a potential partner does not share these values, they are likely to be rejected by an SME in search for an open innovation partner (Dubouloz et al., 2021, p. 123). Doing so, organizations might miss out on opportunities provided by potential partners that have different experience and competencies, not being able to look past some other factors.

The lack of partner research prior to entering a partnership is another challenge when it comes to partners. According to Bertello et al. (2021, p. 90), most SMEs do not map out their partners going into a project and only a few SMEs spend time before the start of the project to learn about their partners. This lack of knowledge about the partners causes other problems, such as limited knowledge due to heterogeneity, frictions in the collaboration, and goal incongruence (Bertello et al., 2021, p. 90). According to an interviewee of Bertello et al. (2021, p. 97), the reason for this lack of information gathering was a result of a lack of resources. This is strengthened by Theyel (2013, p. 256) findings that suggest that SMEs lack managerial capacity and resources to find appropriate partners.

Working with partners

Another barrier mentioned by Dubouloz et al. (2021, p. 121) is the struggle to communicate with partners. The processes of open innovation can be slowed down if organizations working together struggle to communicate due to differences in their language and common knowledge (Dubouloz et al., 2021, p. 121). This barrier can both be visible in terms of imbalance of hard knowledge, and how knowledge is communicated between partners (Dubouloz et al., 2021, p. 123). Problems also occur when there is a clear difference in tempo between the organizations and this is most prevalent in public/private or university/enterprise collaborations with public entities tending to be more sluggish (Dubouloz et al., 2021, p. 124).

Once a partnership has been formed, the SME must be able to absorb the knowledge they receive from their partners. However, SMEs tend to lack the required competency to adopt acquired external knowledge and technologies and integrate it with their current internal knowledge and technologies (Vossen, 1998, p. 89). This means that SMEs do not receive as big of an effect from acquired external knowledge as larger enterprises with more resources. This view is also supported by Chesbrough (2010) who argued for SMEs' lack of capacity to seek and absorb external knowledge in comparison to large enterprises. This is also noticeable when SMEs partner up with and attempt to absorb scientific output from universities and research labs (Spithoven et al., 2013, p. 542). The reason for this is a lack of personnel with the required scientific background to handle the scientific output

in an effective and absorptive way, meaning SMEs often do not benefit as much as large enterprises in this area (Spithoven et al., 2013, p. 542).

Lastly, a crucial part for making open innovation work and lead to higher returns is to manage the partnerships carefully (Sağ et al., 2016, p. 759). However, SMEs tend to lack the necessary resources and competencies needed to effectively maintain these networks and collaborations (Parida et al., 2012; van de Vrande et al., 2009). Brunswicker and Ehrenmann (2013, p. 35) argue that if SMEs want to work with open innovation they will need a designated managerial system for it, although SMEs tend to lack the managerial and technical skills to maintain this type of system (Rahman & Ramos, 2010, p. 479). These shortcomings result in weaker ties with other organizations meaning it is not as easy to maintain the partnerships long-term (Dodourova & Bevis, 2014, p. 4).

Summary of external barriers

Table 2 below summarizes the external barriers that SMEs experience regarding open innovation. The categories of barriers are accompanied by keywords that summarize the key points mentioned in the text above. Key points when finding partners are related to searching, values and doing pre-research. For working with partners, the focus was on communication, implementing the acquired external information, and managing the partnerships.

(Table 2. External barriers of open innovation for SMEs)

External Barriers of open innovation for SMEs	
<i>Category</i>	<i>Keywords</i>
Finding partners	Searching, values, pre-research
Working with partners	Communication, implementing external information, managing partnerships

3.6 Summary of theoretical framework

To summarize our theory chapter, we started off by introducing the concept of innovation and its importance for businesses. Thereafter, the concept was narrowed down to closed innovation. This concept was explained in order to give context to open innovation and its relevance. Then the aspect of small- and medium-sized enterprises was introduced with information about their relevance in the economy and a specification of the definition we use in the study. Finally, open innovation was presented in the context of SMEs, covering the benefits, and most importantly, the internal and external barriers.

(Table 3. Challenges of open innovation for SMEs)

Challenges of open innovation for SMEs			
Internal		External	
Category	Keywords	Category	Keywords
Culture	Organizational culture, attitudes, stakeholders	Finding partners	Searching, values, pre-research
Resources	Financial, time, knowledge and expertise	Working with partners	Communication, implementing external information, managing partnerships
Administration and coordination	Administrative burdens, coordinating collaborations		

4. Practical method

To get detailed information and be able to provide a rich perspective on the subject, this study will be of qualitative nature. By using a qualitative study, active participation by the respondents can be created and a deeper understanding can be achieved (Bryman & Bell, 2011, p. 27). There are several different approaches to qualitative data collection. Creswell (2013, p. 160) defines four types of approaches; interviews, audiovisuals, observations, and documents and for this study, interviews will be used. Interviews are one of the most commonly used qualitative methods for data gathering (Bryman & Bell, 2011, p. 465) and there are two different types typically used; unstructured and semi-structured (Bryman & Bell, 2015, p. 479).

4.1 Data collection and interview design

Based on the purpose of the study, our research method will be to collect primary qualitative data, meaning that findings are only understood within its context and are associated with an interpretivist methodology (Collis & Hussey, 2014, p. 130). It contrasts with quantitative data which usually are very precise and is connected to a positivist methodology where the results have a high degree of reliability rather than

validity (Collis & Hussey, 2014, p. 130). Examples of qualitative data are diagrams, images, audio/visual recordings, broadcasts, focus groups, or as in our case, interviews (Collis & Hussey, 2014, p. 130). By collecting data in this manner, the researcher is faced with a major challenge: to retain the integrity of the data (Collis & Hussey, 2014, p. 131). To overcome this challenge, the researcher must make sure all forms of data generated are collected in a systematic and methodical manner (Collis & Hussey, 2014, p. 131). A common approach for data collection is to follow a five step process, starting with identifying the case followed by choosing data collection method, determining what data to collect and the necessary questions for such, conduct a pilot study and modify the method if necessary for lastly collecting the researched data (Collis & Hussey, 2014, p. 132).

We conducted semi-structured interviews to fulfill the purpose of our thesis as this method corresponds with the qualitative research approach (Saunders et al 2019, p. 437). This creates opportunities for additional aspects of our subject to be revealed as our prepared questions can be complemented by follow-up questions, generating a more detailed understanding. In addition, semi-structured interviews are to be preferred if time is limited and there are no plans for a follow-up interview (Solarino & Aguinis, 2021, p. 660). With this method we can understand the context of our subjects, confirming the meaning of their reality (Saunders et al. 2019, p. 434) and draw conclusions of overcoming barriers within open innovation based on different realities. A semi-structured interview is therefore suitable as it enables this method. However, as a consequence of the semi-structure, it may become difficult to control the range of topics and analyze the data, in comparison to a structured interview (Collis & Hussey, 2009, p. 195).

We decided not to design our interview in an unstructured or structured way for several reasons. As unstructured interviews do not contain pre-determined questions (Saunders et al., 2019, p. 441), it increases the risk of respondents falling off topic in their answers. This impacts the data analysis since the answers from the respondents might differ too much, not generating any common themes. On the contrary, having a structured interview increases the risk of missing important information if our predetermined questions create insufficient coverage of the topic. Structured interviews are therefore more suitable when the goal is to create generalizations through collecting quantifiable data, (Saunders et al., 2019, p. 437), which we do not intend to do. Our study intends to further explore how SMEs in Sweden overcome barriers to working successfully with open innovation, based on the realities of business owners and project leaders taking part in such activities. The conclusion will be based on the respondents personal stories, experiences and understanding of their business's innovative environment, with the end goal of investigating how said barriers are handled in practice. Having a semi-structured interview therefore suits our purpose as we want to explore the topic while remaining within the research field.

4.1.1 Participant selection and sample

When collecting data, three main factors usually prohibit the possibility to survey the entire population: the impracticality, budget constraints, and lack of time (Saunders et al., 2019 p. 274). As an alternative, the researcher may use a sampling technique instead, reducing the amount of data collected by only considering sub groups rather than all possible elements (Saunders et al., 2019, p. 272). The sampling techniques can be divided into two types: probability or representative sampling and non-probability sampling

(Saunders et al. 2019, p. 275). Probability samples imply that the chance of each case from the target group being selected is equal, while the chance of one of each element being picked in a non-probability sample is unknown (Saunders et al., 2019 p. 275-276). In our case, the participants need to be selected in order to fit the thesis purpose, arguing for a non-random (non-probability) sampling technique.

The sampling will be based on the purposive method, where we as researchers select cases based on our judgment of which potential respondents are most likely to answer the research question (Saunders et al., 2019, p. 301). Purposive sampling is often used when the sample size is very small and the cases are particularly informative (Neuman, 2005, cited in Saunders et al., 2019, p. 301), as they were in our study. Furthermore we chose a homogeneous sampling, where we focused on a subgroup in which the participants had similar characteristics. The cases were then selected based on three main criterias: the interviewee had an executive role at an SME, the SME is based in Sweden, and that the SME were participating in open innovation activities. To further define the sampling frame, our choice of purposive sampling is related to non-random sampling. We used this method for three main reasons, starting with the fact that our goal is not to make any generalizations. When the goal is to generalize it is important to use random sampling instead (Collis & Hussey, 2009, p. 209). Furthermore, since our study is under the interpretive paradigm, we focus on experiences from the respondents relating to the thesis subject, a non-random sampling is usable (Bell et al, 2019, p. 34; Collis & Hussey, 2009, p. 212). Finally, this method is the best suited practical technique to find interviewees that match our criteria.

To find these cases, we started by contacting local business incubators to get recommendations and contact information to potential participants. We also looked for historical open innovation events that had taken place near us and asked the host for similar information as the incubators. In addition, we used our own professional networks to get in contact with people in suitable SMEs. This resulted in us getting direct contact with our potential interviewees, not having to go through several instances at the enterprises. We sent the participants an initial email containing an invitation to participate in the study as well as additional information about the thesis purpose and GDPR guidelines (Appendix X). After having an active dialogue with each participant and finding a suitable time slot, we ended up with a total of 8 interviewees.

4.1.2 Conducting the interviews

Since our respondents are based on different locations in Sweden it is important to offer having the interviews online, which we used Microsoft Teams meetings for. This enables a non-geographical approach and helps increase the participation rate of our sampled cases. We also need to consider the busy schedule of our respondents, since running an enterprise can be very hectic. We therefore need to take actions to make their participation as easy as possible. This means we cannot rely on them having time for traveling and that we have to be open for flexible time slots in our daily schedule. These constraints can therefore be enabled by online interviews, which in addition is seen as good as a face-to-face approach (Solarino & Aguinis, 2021 p. 663).

Since time is of the essence for our interviewees, we have to be careful with the time management. It is important that the participant knows beforehand how long the interview will take, and making sure that timeframe is followed. We set the duration to between 30

and 60 minutes depending on how much the respondent has to say on each question and to have room for additional follow-up questions. It is also common to underestimate the amount of time needed for an interview (Saunders et al., 2019, p. 465), why we want to present a range of possible ending times but also making sure enough time is set aside from the participants' ordinary schedule to finish our interviews.

All interviews will follow the same structure, starting with a disclosure of the research ethics and information about the anonymity and possibility to end the interview at any point. The respondent then has to confirm they have understood and agree to participating in the study on such terms, which will be recorded. Once that is done we present the context of our study once again and answer any questions the respondent may have based on the pre-interview information received. This is then followed by background questions as it is an effective way of contextualizing the qualitative data (Collis & Hussey, 2014, p. 130) and also for making the participant feel comfortable by asking questions they easily can answer. The main content of the interview will then follow the summary of barriers described in our theoretical framework (see figure 1). Our predetermined questions will be sorted among two parts; internal and external barriers. The internal barriers are divided into three categories: Culture, Resources, and Administration and Coordination, and the external barriers are divided into two categories: Finding partners, and Working with partners. For example, we will start by asking questions about the barriers related to culture, and once the respondent feels content with their answers, we move on to the next category. We will then go through each category one by one by giving the respondent the opportunity to add any additional barriers that have not been mentioned. By conducting the interview in this manner we believe the answers will contribute to the thesis purpose. You can see an overview of the interviews and respondents in table 4.

(Table 4. Overview of interviews and respondents)

Name	Role	Industry	Date	Duration
Conny	Founder	Music	2023-04-19	00:57:50
Dennis	CEO, Founder	Software	2023-04-20	00:50:30
Dan	CEO	Wealth Tech	2023-04-20	00:40:38
Tina	Head of Project Management	Digital Media	2023-04-21	00:49:48
Karl	CEO	Education	2023-04-21	01:05:11
Isabelle	CEO	Construction	2023-04-24	00:47:46
Jakob	Head of Sales and Marketing	Construction	2023-04-25	00:58:19
Jesper	Head of Consultants	Recruitment	2023-04-25	00:38:28

4.1.3 Interview guide

As previously mentioned, we designed the interview guide based on three parts, beginning with a background, followed by internal and external barriers (see Appendix 3

and Appendix 4). The first part regarding internal barriers is divided into three categories: Culture, Resources, and Administration and Coordination. These three categories then in turn consist of several semi-open questions with the aim of fully exploring the topic of each category. We then ask the respondent what actions they take to overcome the barriers within the category and ask follow-up questions if necessary before moving on to the next. Once all three categories of internal barriers have been discussed, the interviewee gets the chance to add additional barriers they might have experienced and comment which barrier affects them the most. By doing so, we decrease the chance of missing out on relevant information and getting a broader contextualization of the difficulties of overcoming each barrier in relation to each other. The interview then moves on to the external barriers, where the structure is the same as internal but divided into two categories instead of three. The two categories are finding partners and working with partners. After the two have been discussed the interview once again gets the chance to add additional external barriers and comment which one has the most impact. We then ask the respondent if they want to add anything to the interview as a whole in order to finalize and conclude the study. By designing the interview in this way we make sure to avoid leading questions, ensuring the respondent was given the chance to describe the situation as they wish, which is crucial in order to successfully conduct a semi-structured interview (Saunders et al., 2019, p. 458-459). Each question is based on theories from the theoretical framework which is visible in the interview guide. This serves as a motivation for their relevance to the research purpose.

The interview guide was prepared in both English and Swedish, since conducting an interview in a language that all participants know the most decreases the risk of translation errors (Bell et al., 2019, p. 70). As we have Swedish as our native language and have excellent skills in the English language this arrangement is natural. However, no interviews were held in English in the end since all respondents preferred to have the study in Swedish.

4.1.4 Recording and transcription

All conducted interviews were recorded. This was easily done due to Microsoft Teams' recording function and all our interviews being done that way. Recording the interviews ensured that no information was lost and allowed us to be present in the interview instead of taking notes, resulting in more thought-ought follow-up questions. The interviewees were informed of the recording and were given an explanation of the benefits of this before they agreed. Other benefits of recording the interview include the ability to re-listen, unbiased record and the avoidance of human error, and the ability to use direct quotes (Saunders et al., 2016, p. 413). A potential disadvantage is that the interviewee shifts focus from the interview and holds back answers (Saunders et al., 2016, p. 413). This is a problem we tried to counteract by informing the interviewees of their anonymity and how the data is stored. Another potential disadvantage is the time required to transcribe the audio-recording (Saunders et al., 2016, p. 413), something that was counteracted using technology.

After the interviews were recorded, they were transcribed. Transcription means that the audio-recording is reproduced verbatim in the form of text (Saunders et al., 2016, p. 572). It is, however, very time consuming and most research methods text argue that transcriptions can take between 6 to 10 hours (Saunders et al., 2016, p. 572). One way of speeding up the process of transcription is to use voice-recognition software. For this, we used Microsoft Teams built-in transcription function simultaneously to the recording.

However, this function is imperfect, meaning that it does not correctly transcribe every single word. To fix this, we re-listened to the audio-recordings and manually transcribed the parts of the text that were flawed in transcription. Another way of speeding up the process is to only transcribe the parts of the recording relevant to the research. We identified which parts of the interview contained the data relevant for our research question, leaving parts such as our introduction untranscribed. This sped up our transcription process because we did not have to transcribe all of the audio verbatim manually.

4.2 Data analysis

We used a thematic analysis with an inductive approach, meaning that we came up with different first order codes based on the interview answers. Some examples of these are “Choosing the right team members and involving them in the innovation work” and “Equal exchange of value for both parts”. These codes were reworked during the progression of the analysis until we ended up with the current ones. Thereafter, we categorized them into second order codes and finally into our four main aggregated dimensions. To ensure nothing was lost due to a language barrier, we conducted both the interviews and the analysis in Swedish. This was a natural approach considering it is the native language of both us and all our interviewees. We avoided translations as much as possible, resulting in a translation of only our final coded quotes.

A thematic analysis is a common method for analyzing qualitative data and is the approach of searching for patterns in the data and creating codes based on these patterns (Saunders et al., 2016, p. 579). The thematic analysis is flexible, meaning it is applicable to large and disparate amounts of qualitative data (Saunders et al., 2016, p. 579). This flexibility was necessary for our study because we conducted interviews with 8 people, from 8 different companies that vary heavily in size, industry, and culture. Despite being flexible, thematic analysis is a systematic way of finding rich descriptions, explanations and theorizing which allows us to provide rich results using our data (Saunders et al., 2016, p. 579). Due to our thesis taking an interpretivist standpoint, the goal is to explore different perspectives on the subject from different respondents, which the thematic analysis is effective for (Braun & Clarke, 2006, p. 97).

Our transcribed data was first used to create the first order codes, which were then abstracted into second order codes, and then further categorized into aggregated dimensions. Our thematic analysis can be divided into 5 steps; (1) transcribing, (2) developing initial codes based on the transcriptions, (3) developing first order codes based on connections in the initial codes, (4) categorizing into second order codes, (5) categorizing further into aggregated dimensions. We will now describe the steps in more detail.

1. Transcription

The first step of our thematic analysis was to transcribe the content of the 8 interviews we conducted. The transcription phase lays the foundation for the rest of the analysis and gives us a better understanding of the results (Braun & Clarke, 2006, p.16). The interviews were recorded and transcribed automatically in Microsoft Teams. Because Teams’ transcription function does not create a clear transcription, we thereafter rewrote it in Microsoft Word. Though it is beneficial to manually transcribe in order to become

familiar with the data (Saunders et al., 2016, p. 580), this would be too time-consuming and we deemed it sufficient for our understanding to rewrite the generated transcription.

2. *Developing initial codes*

In the next step of our analysis, we went through the transcriptions and identified codes among the answers. This process was made easier due to our gained understanding of our results. The information we picked out and created codes based on, were the sentences in which the respondents described how barriers of open innovation are overcome. We developed labels during the analysis and refined them over time. In this step, the categories are not distilled, meaning there can be an overwhelming amount of different categories before moving on to the next step (Gioia et al., 2013, p. 20). For example, one label started as “Looking up potential partners’ and customers’ results and balance sheets” and was later refined to “Thorough research of potential partners’ financial situations” in order to fit other quotes.

3. *Developing first order codes*

Thirdly, we analyzed our initial codes to look for patterns and similarities. Coding allows us to link units of data together that have the same meaning (Saunders et al., 2016, p. 582). After we had created initial codes for all our transcriptions, we compiled them in a Microsoft Word document. If a certain code was found at least twice, we identified it as a pattern (Saldaña, 2016, p. 5), and these were grouped together to form the first order codes. Based on the relevant quotes, 20 first order codes were identified.

(Table 5. First-order codes)

First-order codes
1.A.1. Choosing the right team members and involving them in the innovation work
1.A.2. Clear communication of the innovation work and its importance
1.B.1. Establishing cultural core values based on openness and transparency
1.B.2. Setting up directives for employees to actively collect external input
2.A.1. Strong business model and prioritizing being profitable to build a base for innovation
2.A.2. Creative solutions to minimize costs
2.A.3. Communicating the potential financial upsides of innovation and justify the risk
2.A.4. Prioritizing innovation in terms of finances
2.B.1. Prioritizing innovation in terms of time
2.B.2. Effective communication to free up time
2.B.3. Outsourcing
2.C.1. Systematize the innovation work and educate the employees to increase knowledge

3.A.1. Working with responsible people
3.A.2. Technical solutions
4.A.1. Clear presentation of own business and demand from potential partners
4.A.2. Clear strategy for researching potential partners
5.A.1. Equal exchange of value for both parts
5.A.2. Clear strategy for communication
5.A.3. Build and maintain relationships through soft values
5.A.4. Be open minded and responsive to different values and ideas

4. *Categorizing into second order codes*

The second order codes were constructed from combining the categorization of our theoretical framework with the patterns found during analysis. Due to our interviews being structured much like our theoretical framework, clear second order codes could be identified based on the interview quotes, that were similar in categorization to our theory. This made for more abstract categories that help describe the observed phenomena.

5. *Categorizing further into aggregated dimensions*

Finally, the second order codes were abstracted further into four aggregated dimensions that we created based on our theoretical framework. This was done by following the same structure as the interview guide and combining it with the categorizations that occurred based on the first and second order quotes.

4.3 Ethical considerations

In the context of conducting a study, ethics refers to acceptable standards and behavior for guiding the researchers when managing participants (Saunders et al., 2019, p. 252-253). Ethical dimensions should also be considered when gaining access to information, collecting and analyzing data, and when presenting the results (Saunders et al., 2019, p. 252). As we conduct a study containing a handful of participants and collecting real-world firsthand information, achieving a high level of ethical standard is crucial. For establishing such, four important ethical principles should be discussed and taken into consideration: Avoid any harm to participants, informed consent, privacy, and deception (Bryman & Bell 2011, p. 128).

It goes without saying that avoiding any harm made for the participant is the natural approach and of the highest importance for us. With that said however, harm can be experienced in numerous ways such as stress, income loss, physical harm, and harming self esteem (Bryman & Bell, 2011, p. 128), making it somewhat more difficult to detect at first glance. Even though the researchers are ultimately responsible for the avoidance, removing all potential harm therefore becomes unrealistic (Bryman & Bell 2007, p. 69). In our study, we foresee three key areas where the threat of harming participants are

especially present: in the contact leading up to the data collection, the data collection itself and in the presentation of our findings. Firstly, to maximize our chances of avoiding any harm we need to make sure the contacted participants are informed correctly about our proposition and that the communication language is of a proper manner. This means that no personal values are injected nor is any information used in the study without the participants knowledge. During the interviews we need to ensure that the content of the interview guide and any follow-up questions are in line with the participants pre-understanding of the study. We also need to make sure the participant does not feel pressured to answer questions he or she perceives as uncomfortable with, and that time frame is being held as it otherwise may infer a loss of business. In addition, the analysis and presenting of collected data needs to maintain its anonymity and confidentiality. We therefore need to protect the collected data from disclosing personal information or vulnerable information about said companies and assure the data is only used for the purposes of this thesis.

The issue of informed consent is another important aspect of ethical considerations. We touched base a little bit on this topic in the previous paragraph, but in a more elaborate explanation it refers to participants being unaware of them being a subject of the research (Bryman & Bell, 2011, p. 133). To avoid such, disclosing the purpose of the study, the identity of the researchers, and information regarding the research process is important (Bryman & Bell, 2011, p. 133). Furthermore, it is important to inform the participant about the privacy principles connected to the study. We need to assure the interviewee that all information provided to us will be kept confidential, making sure each participant feels treated equally and has a genuine opportunity to withdraw their participation (Bell et al. 2019, p. 123). Lastly, to avoid deception, we informed our participants, prior to the interview, of the purpose of the study and how their answers would be handled and presented. This information could be read in the information sheet sent out to all interviewees when we first reached out to them (see appendix x).

4.4 Overview of practical methodology

Below, we have compiled our practical methodology into a table that gives an overview of the chapter. The data collected was primary, qualitative and gathered through interviews. The interviews were conducted through Microsoft teams and semi-structured. Moving on to the sampling, this study uses a purposive technique. For the data analysis, this was done in a thematic way with an inductive approach. Finally, as for ethical considerations, the focus was on avoiding harm, having informed consent and putting emphasis on privacy and deception.

(Table 6. Overview of practical methodology)

Data collection method	Primary, qualitative data through interviews
Interviews	Semi-structured interviews using Microsoft Teams
Sampling technique	Purposive
Data analysis	Thematic with an inductive approach
Ethical considerations	Avoiding harm, informed consent, privacy and deception

5. Empirical findings

In this chapter we will focus on the findings from our qualitative data collection. We will present the aggregated dimensions in depth, describing both first order and second order codes. The dimensions will be explained separately in order to provide an understanding of our interpretation of the respondents' answers, starting with the overview of our findings.

5.1 Findings and data structure

This study aims to gain understanding for how SMEs in Sweden overcome the barriers of innovation. The process can briefly be described as using the initial codes to create first order codes, grouping these together into second order codes, and finally grouping these together further into four aggregated dimensions. This resulted in a data structure, providing a visual representation of the analysis has progressed. This can be seen in figure 1.

Aggregated dimension **(1) Culture** is composed of two codes: (1.A) Shaping the team to be open for an involved in the organization's innovation work, and (1.B) Keeping a good attitude towards external ideas and not relying too much on internally generated ideas.

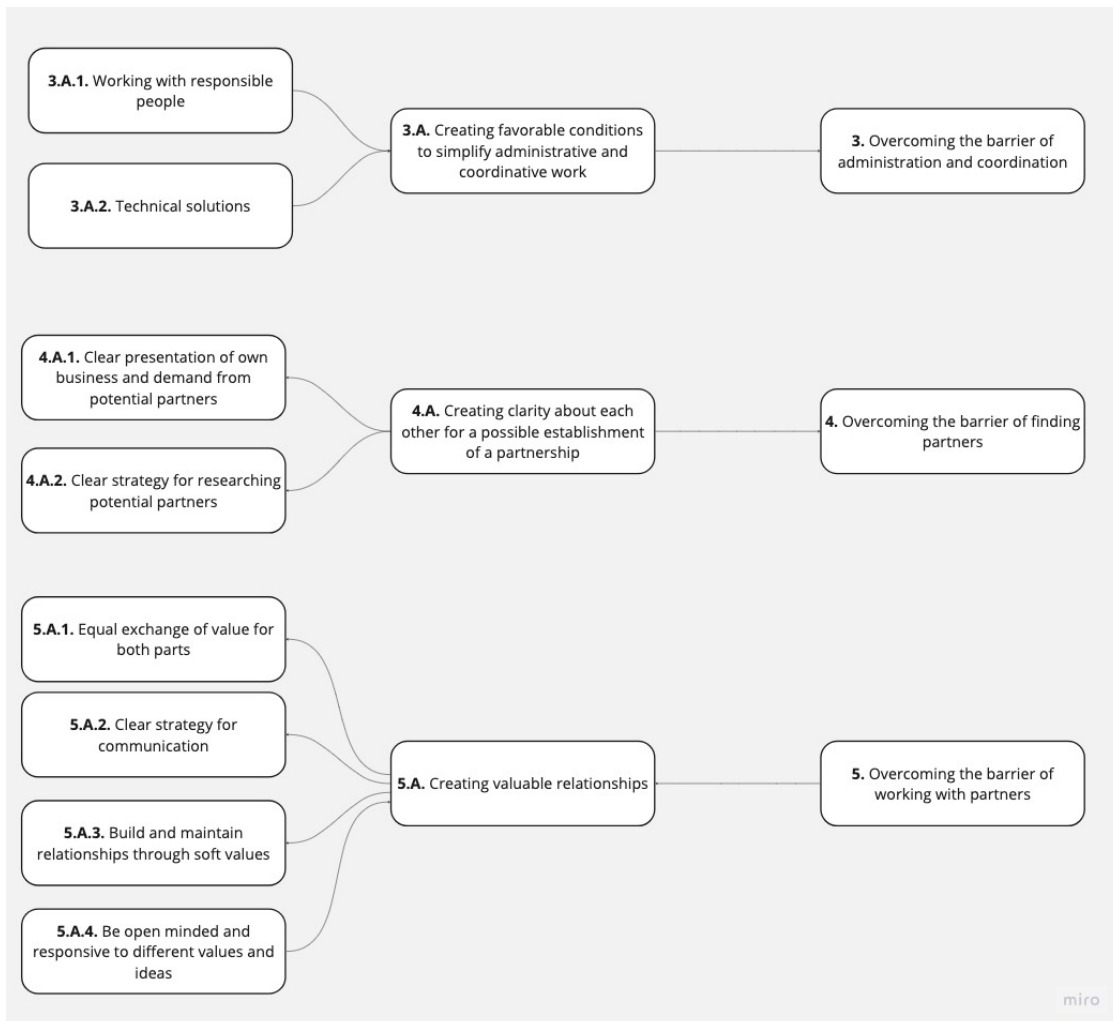
Aggregated dimension **(2) Lack of resources** is composed of three codes: (2.A) Being financially resourceful, (2.B) Effective time management, and (2.C) Educating the employees on innovation.

Aggregated dimension **(3) Administration and coordination** is composed of one code: (3A) Creating favorable conditions to simplify administrative and coordinative work.

Aggregated dimension **(4) Finding partners** is composed of one code: (4.A) Creating clarity about each other for a possible establishment of a partnership.

Aggregated dimension **(5) Working with partners** is composed of one code: (5.A) Creating valuable relationships.





(Figure 1. Theoretical framework)

5.2 Aggregated dimension 1: Overcoming the barrier of company culture

The first dimension of our study is how barriers related to culture within the company affects organizations' open innovation work. This dimension is divided into code (1.A) Shaping the team to be open for and involved in the organization's innovation work, and (1.B) Keeping a good attitude towards external ideas and not relying too much on internally generated ideas.

1.A Shaping the team to be open for and involved in the organization's innovation work

Overcoming the barrier of company culture can be explained by codes (1.A.1) Choosing the right team members and involving them in the innovation work, and (1.A.2) Clear communication of the innovation work and its importance.

Choosing the right team members and involving them in the innovation work (1.A.1) was mentioned as a solution to overcoming the barrier of company culture for open

innovation. Our respondents answered that putting together a strong team and working actively with them was a common action taken to overcome the problem.

"[...] we put together a management team, consisting of managers from different districts and started working with them actively." - Karl

Building a strong team is not the entire solution. After a team has been formed, it is important to involve the members as well as the customers in the innovation work to handle the barriers:

"But can we involve the customers and the employees so that we raise awareness of the risks and the risks are out on the table, then we can handle them and decrease the risks of innovation." - Dennis

Clear communication of the innovation work and its importance (1.A.2) was, according to our respondents, another solution to overcoming the barrier of culture. Our respondents emphasized clear communication around the innovation work and how important it is to the company.

"It's about raising awareness that we are not necessarily swimming in money but there could be large economic incentives in creating a big innovation." - Isabelle

After raising awareness, the team needs to be informed more specifically about the purpose of innovation and what the possible outcomes are, making sure the discussion is not only being held, but also generating valuable outputs:

"Innovation should not only be about opportunities and ideas one may come up with, but also focus on which problem are we solving? What problems may occur if we do this change? You have to work with broader perspective around innovation and not just only present a cool solution" - Dennis

1.B Keeping a good attitude towards external ideas and not relying too much on internally generated ideas

Keeping a good attitude towards external ideas and not relying too much on internally generated ideas can be further explained by codes (1.B.1) establishing cultural core values based on openness and transparency, and (1.B.2) setting up directives for employees to actively collect external input.

Firstly, establishing cultural core values based on openness and transparency (1.B.1) is a way of overcoming the barrier of keeping a good attitude towards external ideas and not relying too much on internally generated ideas. Establishing a culture of openness and transparency is according to our respondents a way of increasing the acceptance of external ideas.

"Creating conditions for everyone to feel welcome and not be judged for coming up with a bad idea because there are none, which creates good conditions for a good discussion." - Isabelle

By establishing this type of company culture, it creates a supportive environment where ideas can flow freely:

"[...] and it's also part of our company culture that we support and help each other and then share ideas with each other." - Dan

Other respondents spoke about how the process of taking in input becomes natural due to their business model. In two cases, the business models were based on the ability to change and develop services together with customers.

Secondly, setting up directives for employees to actively collect external input (1.B.2) is another way of overcoming the barrier. Our respondents actively direct their employees to be aware of their environment and the opinions of customers.

"The units should reflect over their environment and their customers." - Karl

By reflecting over the environment and being humble for the fact that the customers have the most important opinion, the respondents said that you can detach from the company's own ideas and focus on the external input:

"[...] the opinion of the customer is much more important because they are the ones using and experiencing our product." - Dennis

5.3 Aggregated dimension 2: Overcoming the barrier of lack of resources

The second dimension of our study is how barriers related to a lack of resources within the company affects organizations' open innovation work. This dimension is divided into code (2.A) Being financially resourceful, (2.B) Effective time management, and (2.C) Educating the employees on innovation.

2.A Being financially resourceful

Overcoming the barrier of lack of financial resources can be explained by codes (2.A.1) strong business model and prioritizing being profitable to build a base for innovation, (2.A.2) creative solutions to minimize costs, (2.A.3) communicating the potential financial upsides of innovation and justify the risk, and (2.A.4) prioritizing innovation in terms of finances.

Firstly, overcoming the barrier of lack of financial resources can, according to our respondents, be achieved by having a strong business model and prioritizing being profitable to build a base for innovation (2.A.1). Our respondents argued for steady growth and profitability being the main enablers for their ability to invest financial resources into innovation.

"One of our biggest enablers of innovation was actually our growth" - Karl

In one case, being fundamentally profitable was even a requirement for allowing the enterprise to innovate:

"It is absolutely a prerequisite that if we want to innovate, we have to be profitable." - Jakob

Secondly, this barrier can be overcome by creative solutions that minimize costs (2.A.2). Our respondents told us about finding creative solutions to work around the innovations when a lack of financial resources hindered them.

"You have to be smart and find other ways." - Jesper

By continuous creativity, one can work around the company's limitations and achieve the same result in a way that was not originally thought of:

"[...] we have tried to innovate in that way and it does not seem to work. There is something there but we do not have the resources to continue, and then you have to find some sort of solution which leads to another innovation" - Conny

Thirdly, the barrier can be overcome by communicating the potential financial upsides of innovation and justifying the risk (2.A.3). Our respondents spoke about the importance of raising awareness of the potential benefits that come from taking risks connected to innovation.

"It's about raising awareness that we are not necessarily swimming in money but there could be large economic incentives in creating a big innovation." - Isabelle

Sometimes it is a matter of risk tolerance. One respondent highlighted the importance of bravery in the leadership when it comes to motivating the team to be comfortable with the risks associated with innovation:

"The key, which is also the risk, is bravery. [...] I am quite willing to take risks." - Karl

Finally, the barrier of lack of financial resources can be overcome by prioritizing innovation in terms of finances (2.A.4). Our respondents answered that to free up financial resources for open innovation purposes, there is a necessity for prioritization.

"When it comes to resources, it is a question of priority" - Jakob

Once again, one respondent emphasized the role of the manager in the prioritization of open innovation:

"[...] also to focus on what is prioritized. I think that is one of my strengths [...]" - Karl

2.B Effective time management

Overcoming the barrier of lack of time can be explained by codes (2.B.1) Prioritizing innovation in terms of time, (2.B.2) Effective communication to free up time, and (2.B.3) Outsourcing.

Firstly, this barrier can be overcome by Prioritizing innovation in terms of time (2.B.1). Our respondents argue that because time almost always is a scarce resource, it comes down to prioritization.

"[...] I have had to prioritize, that is how it is." - Isabelle

In the experience of one of our respondents, not enough people view innovation work as something to prioritize, which leads to a lacking quality of their product or service:

"I think that you have to prioritize because from our experience, people do not think through it enough before releasing a product, and cut of or minimize innovation work because they don't deem it as important" - Dennis

Secondly, the barrier can be overcome using effective communication that frees up time (2.B.2). By conducting effective internal communication, more time is freed up for open innovation work.

"Then it comes down to internal communication, meaning if you want to free up time, you have to communicate. Then you can free up time for the innovation processes." - Dan

More specifically, a respondent gives an example of an action they take to free up time for innovation, being weekly meetings:

"We have weekly meetings [...] we save lots of time with these meetings [...]. This way, you become more productive and can maximize the time spent on innovation." - Conny

Finally, the barrier of lack of time can be overcome by outsourcing (2.B.3). Delegating and outsourcing tasks is a way of freeing up time to spend on innovation work.

"It is about distributing work [...] and hiring people to do the job you have previously done to free time for us to work with open innovation." - Jesper

"[...] later this week we have a collaboration with a company. We could have done the work ourselves but [...] it would have taken more time. Because they have those competencies, we save time we can use for open innovation." - Conny

Here, both respondents emphasize that they have chosen to delegate work, even though they have the ability to do it themselves, in order to spend more time on open innovation activities.

2.C Educating the employees on innovation

Overcoming the barrier of lack of competency related to open innovation can be explained by code (2.C.1) Systematizing the innovation work and educating the employees to increase knowledge.

Our respondents answered that taking the strategic management decision to systematize innovation processes and educate the teams (2.C.1) is a way of overcoming the barrier.

"It is a strategic question for the management [...] it is something that the management needs to show that everyone is involved in" - Dennis

"We solve the problem of lack of competency by systematizing the innovation work to increase the knowledge within the company" - Jakob

This respondent gives a concrete example of a way to construct the teams to achieve the desired outcome:

"Another thing is to build cross-functional teams. Meaning we collect competencies and avoid the silo mentality [...] and can build these mixed teams." - Dennis

5.4 Aggregated dimension 3: Overcoming the barrier of administration and coordination

The third dimension of our study is how barriers related to administration and coordination affects the open innovation work within the company. This dimension only consists of (3.A) Creating favorable conditions to simplify administrative and coordinative work.

3.A Overcoming the barrier of administration and coordination

Overcoming the barrier of administration and coordination can be explained by codes (3.A.1) working with responsible people and (3.A.2) technical solutions.

Working with responsible people (3.A.1) is a way to overcome this barrier. They answered that when working with trustworthy, responsible people, they do not notice many problems related to administration and coordination.

"I haven't noticed much falling through the cracks when we are working with external partners but that is because we pick good partners who keep track of their things." - Isabelle

One respondent highlights the fact that you cannot be everywhere in the organization and therefore must set directives for the team to work without constant supervision:

"[...] you don't have to be everywhere and have vision over everything, you set up the playing field and agree on the way of working and the rules." - Karl

Another way of overcoming this barrier is by making use of technical solutions (3.A.2). Our respondents answered that by using technical solutions in the form of platforms and systems, you can streamline the administrative and coordinative processes.

"We use a technical platform to counteract the administrative burdens" - Dennis

"We use Gant Charts to plan our resources [...]" - Tina

*“We use excel and other different types of digital workspaces for structuring our work”
- Dan*

5.5 Aggregated dimension 4: Overcoming the barrier of finding partners

The fourth dimension of our study is how barriers related to finding partners affect the open innovation work. This dimension consists of (4.A) Creating clarity about each other for a possible establishment of a partnership

4.A Creating clarity about each other for a possible establishment of a partnership

Overcoming the barrier of finding partners can be achieved by (4.A.1) having a clear presentation of own business and demand from potential partners and (4.A.2) a clear strategy for researching potential partners,

A clear presentation of one’s own business and demand from potential partners (4.A.1) is a way of overcoming the barrier of finding partners. Our respondents answered that by having a very clear picture of the own company and being able to present it to potential partners, one can overcome this barrier.

*“One part of the innovation process is to present ourselves in a way that people understand [...] usually through examples of what we do since we offer so much.” -
Tina*

In combination with presenting one’s own company, it is also about being clear about the expectations of the partner:

“It is about setting a clear framework: What we do, our expectations, and demands. It's important to know where we stand and what we look for in our partners” - Jakob

Another way of overcoming the barrier of finding partners is to have a clear strategy for researching potential partners (4.A.2). According to our respondents, having a strategy for what to research is necessary to avoid uncertainties.

“It is important to look at financial statements and potential payment defaults. It is the sort of things that people don't usually say [...]” - Tina

Another respondent supported this idea with a metaphor:

“We got new owners in January so now there is a very clear strategy for researching partners [...] we never want to buy the pig in the bag.” - Isabelle

5.6 Aggregated dimension 5: Overcoming the barrier of working with partners

The fifth and final dimension of our study is how barriers related to working with partners affect the open innovation work. This dimension consists of (5.A) Creating valuable relationships.

5.A Creating valuable relationships

Overcoming the barrier of working with partners can be done by (5.A.1) equal exchange of value for both parts, (5.A.2) clear strategy for communication, (5.A.3) build and maintain relationships through soft values, and (5.A.4) be open minded and responsive to different values and ideas.

Firstly, a way to overcome this barrier is to ensure an equal exchange of value for both parts (5.A.1).

"As long as both parties earns from a partnership it usually is not a problem to maintain it" - Karl

One respondent highlighted creating a positive synergy in the partnership:

"You want to make sure that 1+1 equals 3 somehow, as a result of the partnership." - Dennis

The other respondents agreed on the fact that an equal exchange of value is key in maintaining partnerships for open innovation. They highlighted the importance of offering clear value to the partner and realizing that the partner has competences they do not have.

Secondly, the barrier can be overcome by having a clear strategy for communication (5.A.2). Our respondents answered that knowing how to deal with communication is key in order to maintain partnerships. One example is duality when communicating.

We have two people working with all partners today. It's about teamwork. I believe there needs to be more than one person for working with partners [...] if something happens, the other person can still maintain contact and the other one can create a new one" - Dennis

Another respondent mentioned that they include each other in their mail conversations in order to increase the involvement in the work with partners:

"We want a culture where we for example always CC each other, because you never know, if something happens its good to have another person in the loop." - Tina

One specific part of one respondent's strategy was to ask questions until they understand, creating a culture where it is okay to not understand immediately:

“I ask about all i want to know, and if i don’t understand i ask again right away until i do. I think it invites to an open dialogue were both parts understand each other and not only uses complicated terms.” - Isabelle

Thirdly, another way of overcoming the barrier is to build and maintain relationships through soft values (5.A.3). Here, our respondents emphasized the importance of using soft values when building relationships for open innovation as an SME. By treating the business relationships like a personal relationship, stronger connections are built.

“I think it is very healthy for any relationship, not only business wise, to not forget about the human factor. It is after all a person sitting behind a business, as if it were a fellow human or a friend.” - Conny

According to one respondent, value exchange does not always have to be concrete but can also mean keeping each other updated and in mind:

“I would say it is about keeping each other in the pipeline as a base for the relationship. That part has a big impact. And then try to keep it up.” - Jesper

This respondent emphasizes the importance of personal connection and informality:

“It could be about having lunch together, saying hi if you bump in to each other around town or on events [...]” - Tina

Finally, the barrier of working with partners in open innovation can be overcome by being open-minded and responsive to different values and ideas (5.A.4). The respondents emphasized having an open mindset.

“I believe we have an open mindset [...] I guess it is some sort of underlying factor, whether it is culture or the personalities that our company values are based on.” - Jesper

Our findings show that dissimilarities should be encouraged, and common ground should be searched for:

“I would say even though we may be different, Its still about people, profitability, and selling [...] There is so much to learn from each other. “ - Isabelle

5.6 Summary of empirical findings

As presented, overcoming the barriers of successfully working with innovation can be based on five categories: Culture, Resources, Administration and Coordination, Finding partners, and Working with partners. These categories are the result of five aggregated dimensions from analytically derived codes. In the next chapter we will contextualize the collected data by interpreting the respondents’ answers and connecting them to known theories.

6. Analysis and discussion

6.1 Culture

Firstly, overcoming the barrier of culture in regards to open innovation varied to an extent amongst the respondents. Overall, the majority of SMEs did not perceive this aspect of the organization as a current barrier, since the team who initially started the company were open minded by heart. This determined whether the organizations took a proactive or a reactive response to overcoming the barrier. The organizations who set an open culture from the start avoided the barrier immediately, while the organizations who transitioned from a closed innovation approach to an open innovation approach had to overcome the barrier of an existing closed culture. Here we saw a different approach, the organizations who had to perform a culture shift focused more on changing the constellations of the teams or substituting team members entirely. One example from our findings showed that in these cases, establishing a team within the organization who acted as role models for the new desired company culture and who were from the higher part of the organizational hierarchy was a successful action to make the transition. This was seemingly a way of overcoming the NIH Syndrome, where a hostile view of external ideas and information threatens the open innovation system (Mortara & Minshall, 2011, p. 587). So by choosing the right team members when starting the company, substituting a current team, or creating new teams within the organization, you can overcome the general barrier of culture in terms of open innovation according to our findings.

Secondly, communication of open innovation and its importance was shown by our research to be a way of avoiding barriers related to organizational culture. By having an open dialogue and raising awareness of the benefits of open innovation, the motivation amongst the employees seemingly increased, leading to a more positive attitude towards open innovation. Lack of motivation to contribute to the innovation work is according to van de Vrande et al. (2009, p. 434) a culture-related barrier to open innovation which our research suggests is overcome by effective communication.

Thirdly, our findings emphasized the importance of setting company values based on transparency and openness. Because cultural barriers are more prominent when working with external partners (van de Vrande et al. 2009, p. 427), establishing transparency and openness within the organizational culture showed to be effective against this barrier. Our respondents answered that some ways to establish these core values are to ensure that the employees are supported and feel comfortable sharing ideas and open to taking in ideas. Our findings also emphasized the importance of creating a climate where bad ideas are allowed and where the holder of the idea doesn't feel judged for it. Setting company values based on transparency and openness is also a way for keeping a good attitude towards external ideas and not relying too much on internally generated ideas. Our evidence showed that by putting focus on transparency and openness, the attitude towards external ideas improved and the reliance on internal ideas decreased, counteracting the NIH-syndrome.

Lastly, our study showed that setting up directives for employees to collect external input is a way to improve the attitude towards external ideas. By giving the employees clear directives to reflect over the customers' needs and gather insights from their ecosystem,

our respondents argued that the need for internally generated ideas decreased and there was an improvement in the attitude towards ideas generated externally.

6.2 Lack of resources

In contrast to the barrier of organizational culture, our respondents all answered similarly in many areas when it came to the lack of resources, which is logical considering a lack of financial resources is a frequently experienced barrier and a common reason for early termination of innovative projects (Dubolouz et al., 2021, p. 121). The reason for this is likely that SMEs tend to have less access to resources in comparison to larger companies.

When it comes to the lack of financial resources, our research shows that one way Swedish SMEs overcome this barrier is to build a strong business model and be profitable before engaging in open innovation. Our respondents argued for profitability and growth to be a driver and an enabler of innovation. However, some organizations may struggle to find profitability without being innovative so this could cause a paradox. In this case, some of the respondents went against the theory which states that to survive in today's environment, you must be innovative (Kim & Mauborgne, 2014, p. 2). As a compromise, some interviewees argued for the importance of coming up with creative solutions to minimize costs, suggesting that open innovation is not solely reliant on current profitability and can instead be a way to reach future profitability. Regardless of approach, clearly communicating potential upsides of open innovation to the organization is according to the respondents a way for justifying spending resources. The reason for this could be the natural risk aversion of people, meaning they need a clearly communicated justification to be comfortable with spending resources on open innovation. Our results show that taking risk is a way for SMEs to overcome the barrier of lack of financial resources. This goes in line with the theory which states that SMEs are more willing to take on risks which opens this opportunity to overcome the barrier (Dubouloz et al., 2021, p. 113).

Despite all respondents identifying lack of financial resources as a barrier to open innovation, our research shows that it comes down to a question of prioritization because of the benefits that can be reaped from open innovation. All organizations face scarcity of resources in some way and it is up to the management to spend financial resources in a way that improves the organization.

When it comes to lack of time, our respondents presented different ways of freeing up time for open innovation. Firstly, they emphasized effective communication to free up time. One example brought up was weekly meetings, to make sure communication is planned and does not take up additional time from open innovation processes. A possible reason for this is that smaller organizations lack overall formality and infrastructure in their communication, which means that our respondents see it as an opportunity for improvement in order to save time. It is likely that people involved in SMEs tend to prioritize being task-oriented, spending time on operational activities rather than actively creating communication routines. As a result, communication may be inefficient, which could be why our respondents argue the importance of setting effective communication standards to not lose valuable time.

Another way of overcoming the barrier of lack of time according to our study is to outsource less important work. That way, people in the organization have more to spend

on generating value through open innovation. This could be because SMEs have many tasks that are not value-creating and can instead outsource these in order to perform more value-creating tasks in the form of open innovation activities. As previously mentioned, our findings show that a lack of resources most often is prominent, although realizing the value of open innovation and making it a priority is a way to overcome the barrier. According to Dubolouz et al. (2021, p. 121), SMEs may force innovative processes and hope for quick positive returns due to the lack of time. By making innovation a priority, SMEs should be less likely to rush its innovative processes as a certain amount of time already has been accounted for in the operative schedule. This should prevent projects from being rushed, resulting in a lower rate of abandonment.

Finally, our respondents discussed how to overcome the barrier of lack of competency related to performing open innovation activities. The way of overcoming this was to create systems for educating the employees on open innovation by breaking down the process into routines. As too many sources of external knowledge for innovative activities may generate negative results, organizing networks of knowledge flows needs to be done with consideration (Lee et al., 2021, p. 298). This highlights the importance of knowing how to work within an open innovation system, which our respondents seemingly agree with. For example, by creating cross-functional teams, one respondent explained how competence naturally increased within projects, avoiding a silo mentality. Taking a strategic management decision as such was an effective way of making sure everyone is involved, learning how to cope with open innovation together. By establishing this systematic approach to the open innovation work, employees could focus on smaller tasks rather than the whole process at once. This increased the overall competence among the employees in relation to open innovation. We can imagine this being an effective tool, since company roles within SMEs usually are scattered, but when systematizing the process every role becomes more defined.

6.3 Administration and coordination

The ways of overcoming administrative burdens were very similar to the way coordinative burdens are overcome meaning we integrated these into one category. First of all, our research showed that responsibility among all parts involved in the open innovation process led to a decrease in administrative and coordinative burdens. When our respondents felt confidence in their partners and employees' abilities, it became easier for them to delegate responsibility and trust that the work was done correctly. This eliminated the need to constantly oversee the processes and reduced the amount of problems in relation to administrative and coordinative work. Research shows that managers and owners of SMEs typically have a background of particular technological skills more often than as an executive (Torchia & Calabro, 2019, p. 207). The lack of experience and modern management methods means that implementation and coordination occasionally might be tough tasks to execute in SMEs (Torchia & Calabro, 2019, p. 207). However, our respondents seemingly solved the problem by working with responsible people, meaning that the responsibility of administration and coordination does not solely come down to the executive and is instead shared.

Another way our study indicated that the problem of administration and coordination was overcome, was through technical solutions. Our respondents mentioned things such as digital spreadsheet tools and platforms for innovative processes. By using technological solutions as such, our respondents explained how the administrative and coordination

work became easier. This meant that the need for managerial experience was reduced, which argues against the theory by Torchia & Calabro (2019, p. 207), that such experience would be important in order to overcome this barrier. Another concept seen in literature is to use intermediary agents to streamline open innovation processes and manage multilateral relationships (Malik & Wei, 2011, cited in Torchia & Calabro, 2019, p. 215). A possibility is that these technical platforms serve the purpose of an intermediary agent by making the processes of working together with innovation easier. We believe this because our respondents mentioned that the collaboration has become easier as a result of these platforms, making up for any lack of capacity in terms of coordinating and administering information which an intermediary agent would contribute with.

6.4 Finding partners

First off, the respondents emphasized the importance of presenting a clear picture of their own business, as well as having a clear description of what they are looking for in a partner. For SMEs this aspect may be more prevalent because companies are likely to be unknown to each other due to their smaller significance in the market, but also because of their potentially niche business model. Compared to larger firms, SMEs are limited in their ability to scan and monitor their environment (Lichtenthaler, 2003, cited in Lee et al., 2010, p. 293), which is a likely reason for SMEs to not be aware of the organizations in their proximity. As a result, we can see why the respondents believe this is an important part of open innovation work, compared to if the same question was asked to a bigger company where their business already may be known by the public.

Our study also showed that having a clear strategy for researching partners was a way of overcoming the barrier. Bertello et al. (2021, p. 97) claims that SMEs tend to not gather information to the same extent as larger organizations when researching partners due to a lack of resources. According to our respondents, a way of overcoming this is to have a predetermined way of performing the research, which makes the research process more resource efficient. The strategies are seemingly not very complicated, often focusing on just collecting basic information. By using simpler research methods, SMEs can benefit from a decreased cost in the searching process, as well as during the information handling process. SMEs may experience information saturation if they gather too much data about potential partners, and a moderate amount of data might be sufficient to make an informed decision.

6.5 Working with partners

Research shows that SMEs often lack the necessary resources and competencies to maintain open innovation partnerships (Parida et al., 2012; van de Vrande et al., 2009). When it came to working with partners, our study goes against the theory, showing that if there is an equal value exchange between partners, maintaining a partnership is simple. A clear value creation can according to our study be used as leverage for keeping the relationship, seemingly reducing the need for managerial capacity. This also goes against the theory which argues that if SMEs want to work with open innovation, they will need a designated managerial system and skills that they do not usually possess (Brunswick & Ehrenmann, 2013; Rahman & Ramos, 2010). When working with the principle of equal exchange of value, the need for such seems to be less than the theory suggests.

The respondents were also clear about the importance of effective communication with the partners, and how a clear strategy for communication can be used to overcome the barriers of working with partners. The process of open innovation can be slowed down when organizations working together struggle to communicate (Dubouloz et al., 2021, p. 124). As a way of overcoming this, our respondents spoke of a communication system, where information generated by communicating with partners is always shared with multiple individuals, decreasing the risk of miscommunication. For example, having a principle of duality, meaning at least two people have to be responsible for communication with a partner was mentioned, as well as having a culture where emails are always CC:d to several colleagues. Due to their size, SMEs do not need strict formalization and standardization to be coordinated (Ghobadian & Gallear, 1997, p. 87). Because of this, SMEs tend to lack formal systems for communicating and there is more of a focus on direct contact between people. This could be the reason that involving other team members is so important. Involving another person could increase the probability of a personal connection and decrease the loss of information due to human error.

Another aspect emphasized by our respondents in terms of maintaining a partnership is the use of soft values. Shortcomings in resources can result in weaker ties with other organizations, meaning it is not as easy to maintain the partnerships long-term (Dodourova & Bevis, 2014, p. 4). Soft values can seemingly be used as an alternative to resource heavy methods, building business relationships that look more like personal relationships. The respondents discussed contributing soft values to partners in terms of having lunch together, going to the same events, greeting each other in the streets, and keeping each other in the loop of ideas and discussions. Why this is more applicable for SMEs may be because of the higher level of informality compared to larger organizations (Ghobadian & Gallear, 1997, p. 87).

SMEs tend to have an affinity for organizations that share the same values, such as values of solidarity, decisional transparency, and respect for the environment (Dubouloz et al., 2021, p. 123). If a potential partner does not share these values, they are likely to be rejected by an SME in search for an open innovation partner (Dubouloz et al., 2021, p. 123). As this may infer a loss of diversity and variety in competence within the open innovation system, we asked the respondents how to cope with partners having different core values than themselves. Their response was once again to put emphasis on openness and acceptance of differences as part of the company values. It seemed like the way of overcoming the natural resistance for difference was overcome by constantly working with the mindset of the team, and being aware of the tendencies to have bias towards one's own ideas. Finding common grounds and being open-minded to learn from each other were important factors. It seemed like awareness and humility were key in adapting this mindset.

7. Conclusion

7.1 General conclusion

The purpose of this study was to examine how SMEs in Sweden overcome the challenges related to working with open innovation. We aimed to collect data from people in an executive role within the companies. Semi-structured interviews were conducted online

and thereafter the data went through extensive coding and analysis, combined with existing literature in order to answer our research question:

How do Swedish SMEs overcome the challenges of open innovation in practice?

Our findings show five dimensions of barriers SMEs need to overcome in order to successfully work with open innovation: (1) Cultural barriers, (2) Barriers in terms of Resources, (3) Administrative and Coordinative barriers, (4) Barriers regarding finding partners, and (5) Barriers associated with working with partners. Even though the actions are presented in the order of the categories, there is no particular order for implementing the actions in the organization.

Firstly, looking at barriers related to culture, our study suggests two approaches to overcome these. The two approaches each contain two actions, resulting in four different actionable ways to overcome the challenge of company culture. The first approach is to shape the team to be open for and involved in the organization's innovation work. Based on the answers from our respondents, the first action related to the first approach is choosing the right team members in order to establish culture compatible with open innovation, whether it is when starting the company or during a transitional process from closed to open. The second action is to clearly communicate the innovation work and its importance to the team. The other approach is keeping a good attitude towards external ideas and not relying too much on internally generated ideas. This approach contains two actions, the first being the establishment of cultural core values based on openness and transparency, assuring the team has the right mindset for open innovation activities. The second action is to set up directives for employees to actively collect external input. These findings highlight the importance of having an open-minded team to support open innovation work. Open innovation is a collaborative process, and it is therefore logical that the whole organization is informed and motivated to pursue it. However, our findings suggest that companies who work with open innovation tend to have an open-minded culture already within the company, further suggesting that the barrier of company culture often is overcome effortlessly.

Secondly, our study found three approaches to handle the barrier of lack of resources: financial resourcefulness, effective time management, and educating the employees on innovation. The first approach contains four actions, having a strong business model and prioritizing being profitable before innovating, creative solutions to minimize costs, communicating the potential financial upsides of innovation and justify the risk, and prioritizing innovation in terms of finances. The respondents who mentioned the first action argued that their profitability was an enabler of open innovation, while the others claimed that open innovation was an enabler of profitability. This shows that there are two ways of thinking about resource allocation for open innovation. When it came to the approach of effective time management, our study showed three different actions that Swedish SMEs use to free up time for open innovation. The first one is to prioritize innovation in terms of time, the second is to streamline the internal communication to save time, and the third is to outsource work that does not create as much value as open innovation activities. All three actions seem to occur about equally often, suggesting that they can all be useful actions to take depending on the organization's situation. As for the approach of educating the employees on innovation, our study showed that creating clear systems for educating the employees on open innovation was a way to overcome the challenge of lack of competency as a resource. For this barrier, our study could only

identify one specific common solution to the challenge, highlighting the impactfulness of this action. Prioritization was a constant in our interviews regarding resources, highlighting the fact that open innovation is something that will improve the organization and is therefore worth investing in. Compared to spending resources on open innovation whenever a surplus may occur, our findings suggest that open innovation should be a stable part of the enterprise budget and schedule.

Thirdly, in terms of administration and coordination, the approach for overcoming the problem was to create favorable conditions to simplify the administrative and coordinative work. There are two ways our respondents used to accomplish this: working with responsible people and using technical solutions. The uses of these two actions varied, with some respondents using both, and some only one. There was also a variation in how the actions were used specifically in administration and coordination work. Because of this lack of pattern, we draw the conclusion that there is no one way of creating favorable conditions that fits all organizations.

Fourthly, for finding partners, our study showed the importance of creating clarity about each other for a possible establishment of a partnership. This was done by our respondents through clearly communicating one's own business and the expected outcome of a potential partnership to make the creation of partnerships more efficient. In addition, having a predetermined strategy for how to research the potential partners infers a faster and more accurate process that can be refined over time.

Lastly, when it comes to maintaining the partnership, our study shows that creating valuable relationships is key. For this approach, four different actions were identified: The first important factor of keeping partnerships is communication barriers, with our study showing that having a strategy for handling inter-organizational communication is a way to handle these. Our research also suggests the importance of building the organizational relationships using soft values, similar to building personal relationships, in order to establish a stronger connection between the parts. Another factor was that to cooperate with partners being vastly different from oneself, our respondents suggest an open minded and responsive mindset to different values and ideas. Finally, and perhaps most importantly, our respondents spoke about having an equal exchange of value between them and their partners. The study showed that this action overall was more occurring than others across all categories of barriers. This could suggest that this action is the most efficient and important in overcoming the barrier of keeping partnerships, and perhaps even barriers of open innovation in general. By doing this, keeping partnerships alive was relatively effortless according to our answers. If a SMEs has managed to establish valuable relationships with partners, we can see how it positively affects the processes of overcoming the other barriers. If there is an equal exchange of value between two parties, there is a clear incentive to overcome the remaining barriers.

7.2 Theoretical contributions

The aim of this study has been to gain a deeper understanding of how SMEs in Sweden overcome the barriers of open innovation. Our findings have resulted in several theoretical contributions which we will now elaborate on in more detail.

Firstly, our study complements an area of research which is said to be under researched, being open innovation related to SMEs (Lee et al., 2010, p. 299) This is partly as a

consequence of how SMEs operate in vastly different conditions for innovation processes compared to larger firms (Vossen, 1998, p. 88). In addition, there is a gap for investigating how firms overcome innovation barriers in general (Hölzl & Janger 2012, p. 25). Because of this, we believe that our research serves as an important addition to the area, as we have explored it further.

Secondly, our research provides a new perspective to the subject in the form of a new national context being studied. Previous research argues for significant differences among countries when it comes to open innovation in SMEs, arguing for a need for more geographical diversification (Vrgovic et al., 2012; Radziwon & Bogers, 2017). By conducting the study in Sweden, we believe to have further filled this gap, providing insights from one of the most advanced countries worldwide in regard to innovation (Chaminade et al., 2010, p. 2).

Finally, we complement previous research that has discussed the barriers of working with open innovation as an SME, by providing insights regarding how to overcome these barriers. From compiling several studies examining the barriers of open innovation for SMEs, we created our own categories and used interviews to explore the practical actions of Swedish SMEs to overcome these. Thereby building on this previous research, we extend the theory in a practical direction. For example, our study can be used as an extension to Dubolouz et al. (2021) who did an extensive study, presenting the barriers of open innovation in SMEs. A specific example is that the barrier of lack of financial resources that Dubolouz et al. (2021, p. 21) identified can be complemented by our finding that this barrier can be overcome using creative solutions that minimize costs.

7.3 Practical contributions

Our study provides several practical contributions. The findings of our study can be used by decision-makers of SMEs in order to overcome the barriers they experience in connection to open innovation. First, we have provided a clear overview of where in the organization barriers for SMEs may be present. This can be used as a guideline to identify the barriers as they may not be obvious at first glance. Thereafter, we have provided numerous actions connected to each category of barriers, making it clearer for the decision-makers which actions to take to implement the solutions. Our study is applicable as both proactive and reactive solutions, meaning it is useful for preventing the problems as well as solving them when they occur. Worth mentioning is that the actions are in no specific order and that by using one of the approaches, not all actions need to be taken. This should be adjusted based on the organizational situation.

7.4 Societal contributions

We believe that our study will increase the utilization as well as the success of open innovation for SMEs. Because open innovation has been proven to lead to increased “Time-to-market” speed, richer “Know-how” and greater market success (Greco et al., 2019, p. 54-55), improving this large group of companies in their ability to innovate will result in growth of the whole economy. As some of the largest companies in the world reached their positions by innovating (Gawarzynska, 2010, p. 20), improving the ability to innovate among Swedish businesses increases the chance of Sweden to continue generating great companies in the future. In addition, efficient open innovation systems will decrease the amount of good ideas not being pursued. This is because open

innovation allows ideas to come from both internal and external sources, and be implemented in more ways than just in the funnel of a closed organization (Chesbrough, 2006, p. 2). This means that ideas can be passed on if they cannot be executed by one actor and increases the chances of impactful ideas reaching the economy.

Open innovation can also be a way to democratize the innovation work of organizations. Because people naturally want to influence their surroundings, this will likely increase the contentment for people in and around the companies who implement open innovation successfully. By using our findings as directions, SMEs may be able to create an environment that supports the feeling of empowerment among its employees, as well as constantly improving its innovation processes.

Furthermore, a win-win situation occurs when external and internal actors work together, creating value for both the organization and its collaborators (Ghezzi et al., 2016; Herskovits et al., 2013; Piyathasanan et al., 2018, cited in Oumlil et al., 2020, p. 20). By contributing to improve SMEs ability to manage open innovation, we should see an increased collaborativeness of the organizational environment where companies increasingly help each other to create value.

7.5 Limitations and further research

The scope of the study has been limited to Swedish SMEs in order to give a new and more specific addition to open innovation research. This means that the findings not necessarily can be applied to SMEs on a global scale and is something that could be interesting to pursue further research in. Due to the time frame, we have mainly looked for respondents within our close proximity, which is our contacts and companies in northern Sweden. This means that our sample group is not very geographically spread out across Sweden. Further research could focus on the differences for SMEs working with open innovation depending on where in Sweden they are located, for example comparing two different cities far apart.

SMEs is a collective word for micro, small and medium-sized enterprises meaning it is a broad definition. To make the finding of companies easier we decided to pursue all of these three types of enterprises except for one-man companies. This limitation means that not every answer in our study is applicable to every SME. For another study, it could be interesting to separate these from each other, considering a company with 5 employees can differ heavily from a company with 200 employees. It could also be interesting to separate the different categories of barriers to each other. For this study, we have taken a holistic approach, deciding to focus on all identified categories of barriers. Further research could focus on deepening the research of one specific size category or comparing categories of size with each other.

Additionally, due to limited time from our side and from the company's side, we were only able to conduct an interview with one person from each company. This means that our results from each company lie on the perceptions of only one individual. The reality could be different in the case that interviewee, for example, is especially positive to open innovation or vice versa. Open innovation is also a process which involves many parts and people. This means that the perspectives of the collective is an important factor and why only collecting data from one individual may limit our study. For further research, it could be interesting to focus on other perspectives than the one of the decision maker.

This could for example be from the perspective of the employees, partners, or project teams as a whole.

Finally, our data collection has only been taken from a single point in time. We have therefore not been able to measure how the suggested actions may impact the organization over time. We would suggest a study of data collection at two separate occasions, one before the action to overcome a barrier has been taken and one more once the solution has been in motion. This way the researcher can establish what impact an action may have on a certain barrier of open innovation.

This could also be combined with a quantitative aspect, for example researching how severe the barriers are or percentages on how often they are experienced and the success rate in overcoming them.

8. Quality criteria

A qualitative study can be evaluated through four criterias for assessing its level of quality: Credibility, dependability, transferability, and confirmability (Bryman & Bell, 2011, p. 395; Yilmaz, 2013, p. 320). These four categories were developed as an effect from the critique aimed at quantitative studies for not taking ontological and epistemological separations, with the main purpose to ensure both data gathering and analysis in qualitative studies meet a certain quality level. However, there are debates regarding the differences between quantitative and qualitative quality criteria and whether or not one is more applicable than the other in a qualitative research (Bryman & Bell, 2011, p. 395; Yilmaz, 2013, p. 318; Saunders et al., 2019, p. 219). With that being said, the ontological and epistemological positions of the researcher affect the research as a whole (Bryman & Bell, 2011 p. 23). We therefore argue a quality criteria formed for a qualitative study is the logical selection. To establish an ontologically and epistemologically coherent study, we will form our criteria based on these four categories since they are adopted for managing the subjective ontological and epistemological positions. In order to conduct and maintain a high quality, we will consider the criterias and reflect upon these throughout the thesis.

Credibility relates to the trustworthiness of the study (Bryman & Bell, 2011, p. 396). In the credibility factor lies the importance of ensuring that the interviewees social realities are represented the way it is intended to (Sounders et al., 2019, p. 217). This ensuring can be achieved by analysis that produces the best possible explanations of the subject studied and by checking data and interpretations with the interviewees. In addition, the researchers may ask themselves a number of questions to further ensure credibility (Miles & Huberman 1994, p. 278-279). These questions contain perspectives such as to which extent the respondents answers “make sense” and infers conviction, how detailed the context of the answers are, and if the overall findings are coherent and systematically connected (Miles & Huberman, 1994, p. 279). In this thesis, credibility can be established through ensuring the interviewees understand the questions asked in the context of it by reflecting whether to the extent answers “makes sense”. Additionally, follow-up questions during the interviews generate richer, detailed answers and may enlighten new relevant aspects which were not known to us beforehand.

Dependability refers to the consistency of the research through the process and if changes during the process are being recorded (Sounders et al., 2019 p. 217). Dependability is ensured by keeping records and allowing peers to act as auditors during the research process to make sure proper procedures have been followed (Bryman & Bell, 2011, p. 398). Researchers may again ask themselves whether data was collected according to the suggested method, if quality checks were made and if there were peer reviews during the process (Miles & Huberman, 1994, p. 278). This thesis will be reviewed and opposed by peers, and records of data collection will be kept until a grade has been received. We will also strive to argue for our selection and explanation of research methods in a legible manner, as it is a subject of high dependency (Yilmaz, 2013, p. 320).

If the findings of a qualitative study are easily applicable to other settings, the research is considered as transferable (Yilmaz, 2013 p. 320). Transferability can be achieved by providing detailed descriptions of the questions, design, and context as a whole of the research, giving the reader the chance to reflect and compare to other surroundings (Saunders et al., 2019, p. 217). Researchers may ask themselves if the sampling was diverse enough, if the scope and limitations were presented thoroughly and if the study discusses alternative settings where further research can be made. We have therefore aimed to reveal clear and transparent arguments as well as explanations in order to give a holistic view of our findings. Hopefully, our presentation and suggestions for further research results in a perceived transferable study in the eyes of the reader. This could for example be for other countries, other types of organizations or other innovation types.

Finally, if the researchers acted in good faith, confirmability can be assured (Bryman & Bell, 2011, p. 398). Considering total objectivity is nearly impossible when conducting a study, confirmability is achieved when the research seemingly has been executed as objectively as possible (Bryman & Bell, 2011, p. 398). The study may be outlined as such if the findings do not reflect the researchers own values and theoretical preferences (Bryman & Bell, 2011, p. 398), as well as if the analysis of collected data are logical and coherent (Yilmaz, 2013, p. 320). Relevant questions for researchers to ask in this case is whether conclusions presented are explicitly based on displayed data and rivalry discussed, but also if the collected data is available for reanalysis (Miles & Huberman, 1994, p. 278). We hence strive for displaying our data as such and ensure its availability for additional analysis.

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Appendix:

Appendix 1: Information to respondents

Vi heter Carl Fredriksson och Alexander Thyrestam och vi studerar vid Handelshögskolan på Umeå universitet. Vi skriver idag uppsats om hur svenska små- och medelstora företag arbetar med öppen innovation och hur de tar sig an utmaningarna detta innebär. Syftet med denna uppsats är att öka kunskapen och medvetenheten kring öppen innovation samt hur svenska företag arbetar med detta i praktiken.

Vi kommer att genomföra intervjuer med cirka 8 personer i företagsroller som beslutsfattare eller aktivt deltagande i innovationsarbetet i svenska små- och medelstora företag. Materialet kommer att presenteras i en uppsats som publiceras i DivA <https://umu.diva-portal.org/>.

Som respondent kommer du inte att kunna urskiljas utan beskrivs som en av 1-8 respondenter. Du som respondent kommer bli tilldelad en kod för att säkerställa att den information du förser studien med hålls anonym och konfidentiell. Till exempel R-1, R-2 .. R-n, vilket motsvarar respondent-samt intervjunummer. Intervjuerna kommer med godkännande att spelas in och transkriberas ord för ord. Om du som respondent vill, kan du vara en del av transkriberingen. Citat från intervjun kan komma att användas ord för ord i studien. Däremot, kommer citaten användas på ett sätt att din och andras identitet hålls anonyma.

Du kommer att kunna ta del av studiens resultat genom en förfrågan via mejl till författarna. Fortsättningsvis, kan dina citat från intervjuerna återfinnas i den examinerade studien publicerat på DiVA portal. Din identitet kommer att hållas anonym genom hela studiens process.

Det är helt frivilligt att delta. Du kan när som helst välja att inte vara med längre och du behöver inte säga varför.

Om du vill komma i kontakt med oss, kan du göra det på email: alex.thyrestam@hotmail.com eller carl.fredriksson@hotmail.se samt telefon +46 73-826 71 44 eller +46 73-870 00 21.

Appendix 2: Agreement of Data collection

Inför uppsatsarbetet vid enheten för företagsekonomi, Handelshögskolan kommer följande personuppgifter om dig att samlas in och behandlas är namn, email och roll/befattning. Det sistnämnda, är det enda som kommer inkluderas i uppsatsen.

Ditt samtycke behövs för att personuppgifter ska kunna behandlas. Det är Umeå Universitet som är personuppgiftsansvarig för behandlingen. Kontaktuppgifter till Umeå Universitet är Umeå Universitet, 901 87 Umeå, registrator@umu.se, 090-786 50 00.

Umeå Universitet har utsett ett dataskyddsbud. Dataskyddsbudet nås på pulo@umu.se eller genom växel 090-786 50 00.

Dina personuppgifter kommer med stöd av samtycket att behandlas längst fram till den tidpunkt då student arbetet har godkänts. Dina personuppgifter kommer endast att hanteras av behörig student samt behörig personal vid Umeå universitet. Data från intervjuerna, så som ljudinspelningar och transkriberingen kommer att förvaras i Umeå Universitets Microsoft Team mapp och kommer endast vara tillgänglig för författarna samt och dess tilldelade handledare vilken är anställd vid Umeå Universitet. När uppsatsen är godkänd och betygsatt genom Umeås studiearkiv kommer all data förstöras.

Du har när som helst rätt att ta tillbaka ditt samtycke. Detta gör du genom att kontakta Thomas Biedenbach /thomas.biedenbach@umu.se/090-786 63 35. Observera dock att ett återkallande av ditt samtycke inte påverkar lagligheten av behandlingen innan samtycket återkallas.

Du har även rätt att kontakta Umeå universitet för att få information om vilka uppgifter som behandlas om dig eller för att begära rättelse, överföring, radering eller begränsning av dina personuppgifter. Du kan även kontakta universitetets dataskyddsbud på mejl pulo@umu.se. För mer information om hur universitetet behandlar personuppgifter se: umu.se/gdpr.

Du har även rätt att ge klagomål till tillsynsmyndigheten Integritetskyddsmyndigheten om du tycker att vi behandlar dina personuppgifter på ett felaktigt sätt. Samtycker du till att dina personuppgifter används på sätt som beskrivs ovan? Ja
Datum: Namn:

Information om Umeå universitets behandling av personuppgifter i studentarbeten
Om du väljer att delta kommer viss information om dig att behandlas. Denna information kommer att samlas in genomsemi-strukturerade intervjuer och genom Umeå Universitets hemsida. Informationen eller en del av informationen kommer att kunnakopplas till dig genom ljudinspelning och transkriberad intervju, dessa kommer endast att lagerföras i Umeå Universitets Microsoft Teams mapp vilken endast kommer vara tillgänglig för författarna av uppsatsen samt dess tilldelade handledare vilken är anställd vid Umeå Universitet. När uppsatsen är godkänd och betyg har givits via Umeå Universitets studieregister kommer all data förstöras. Uppgifter som kan kopplas till dig på detta sätt räknas som personuppgifter enligt EU:s dataskyddsförordning 2016/679 (GDPR). Anledningen till att det i studentarbetet behöver behandlas sådana personuppgifter är för att kunna bibehålla kvalité och studiens krav.

Umeå universitet är personuppgiftsansvarig för denna behandling. Den rättsliga grunden för personuppgiftsbehandlingen är ditt samtycke i enlighet med EU:s dataskyddsförordning, artikel 6.1 a.

Personuppgifterna kommer att förvaras vid universitetet på ett sådant sätt att, utöver ansvarig student, kommer endast behörig personal vid universitetet att ges tillgång till personuppgifterna. Uppgifterna kommer att behandlas så att inte obehöriga kan ta del av dem.

Dina personuppgifter kommer att behandlas under hela studentarbetet som kommer att pågå till studien är examinerad och godkänd, och kommer därefter att raderas.

Underlag till studentarbeten, där dina personuppgifter ingår, gallras efter att studentens betyg rapporterats i universitetets studieregister.

Enligt EU:s dataskyddsförordning samt nationell kompletterande lagstiftning har du rätt att:

- begära tillgång till dina personuppgifter (begära sk. registerutdrag)
- få dina personuppgifter rättade
- få dina personuppgifter raderade
- få behandlingen av dina personuppgifter begränsad.

Under vissa omständigheter medger dataskyddsförordningen samt kompletterande nationell lagstiftning undantag från dessa rättigheter. Rätten till tillgång till sina uppgifter kan exempelvis begränsas av sekretesskrav, och rätten att få uppgifter raderade kan begränsas av regler rörande arkivering.

Om du vill åberopa någon av dessa rättigheter ska du ta kontakt med dataskyddsombudet vid Umeå universitet (pulo@umu.se) och ange uppgifter om aktuellt studentarbete.

Om du är missnöjd med hur dina personuppgifter behandlas har du rätt att klaga hos Integritetsskyddsmyndigheten. Information om detta finns på myndighetens webbplats (imy.se).

Appendix 3: Interview Guide – English version

Theme	Questions	Purpose	Theory
Introduktion	<ul style="list-style-type: none"> • Explain the interview structure and timeframe. • Disclose ethical considerations and anonymity. • Record permission • Ask about current knowledge of the topic 	Prepare the respondent and inform them of the context of the study as well as their rights when participating. Make sure consent is recorded.	(Saunders et al., 2019)
Background	<ul style="list-style-type: none"> • Please tell us about what your company does, what your role is and the company's main partners in regard to creating open innovation? 	Get contextual information about the person, the company its representing, and current open innovation approach.	(Saunders et al., 2019)
Internal Barriers			
Culture	<ul style="list-style-type: none"> • In what way is the organization culture a barrier for open innovation? • What is the attitude within the company against external ideas and information? • To what extent do you rely on employees making valuable contributions to innovations in relation to other stakeholders? • What actions do you take to overcome these barriers? 	Investigate how organizational culture impacts the possibility to successfully engage in open innovation. Get insight in how this problem can be handled.	(van der Vrande et al. 2009; Mortara and Minshall, 2011; Dubouloz et al, 2021)
Resources	<ul style="list-style-type: none"> • In what way is the lack of resources a barrier for open innovation? • In what way is the lack of time a barrier for open innovation? • In what way is the lack of time a barrier for open innovation? • In what way is the lack of competence a barrier for open innovation? • What actions do you take to overcome these barriers? 	Investigate how the lack of company resources affects enterprises to successfully engage in open innovation. Get insight on how this problem can be handled.	(Dubolouz et al, 2021; Lee et al., 2010; Bartello et al. 2021; Julien, 2002; Lichtenthaler, 2003; Brem et al. 2017; Laursen and Salter, 2004)

Administration & Coordination	<ul style="list-style-type: none"> • In what way is administrative burdens a barrier for open innovation? • In what way is burdens connected to coordination a barrier for open innovation? • What actions do you take to overcome these? 	Investigate how burdens connected to administration and coordination affects the possibility to successfully engage in open innovation. Get insight on how this problem can be handled.	(Bartello et al. 2021; Torchia & Calabro, 2019; Dodourova and Bevis, 2014; Maik & Wei, 2011; Kessler et al. 2007)
Summarizing internal barriers	<ul style="list-style-type: none"> • Is there any other barrier you have experienced that you wish to add? • What internal barrier affects you the most and why? 	Enable the possibility of additional relevant knowledge. Get a contextual understanding of the impact of each barrier in relation to each other.	
External Barriers			
Finding partners	<ul style="list-style-type: none"> • What problems have you noticed when searching for partners to engage with in open innovation? • What is the attitude within the company against collaborating with external partners who have major differences in values and competences? • To what extent do you research potential partners before engaging in a partnership? • Has there been a situation when the lack of research led to a problem? • What actions do you take to overcome these? 	Investigate how barriers for finding partners affects the possibility to successfully engage in open innovation. Get insight on how this problem can be handled.	(Dubouloz et al., 2021; Bertello et al., 2021; Theyel, 2013)

Working with partners	<ul style="list-style-type: none"> • In what way is communication with partners a barrier for open innovation? • What are the challenges for collecting and implementing external knowledge internally? • In what way is managing and maintaining a partnership a barrier for open innovation? • What actions do you take to overcome these? 	Investigate how barriers for working with partners affects the possibility to successfully engage in open innovation. Get insight on how this problem can be handled.	(Dubouloz et al., 2021; Vossen, 1998; Chesbrough, 2010; Spithoven et al., 2013; Sağ, Sezen and Güzel, 2016; Parida et al., 2012; van de Vrande et al. 2009. Brunswicker and Ehrenmann, 2013; Rahman and Ramos, 2010; Dodourova & Bevis, 2014)
Summarizing external barriers	<ul style="list-style-type: none"> • Is there any other external barrier you have experience that you wish to add? • Which external barrier affects you the most and why? 	Enable the possibility of additional relevant knowledge. Get a contextual understanding of the impact of each barrier in relation to each other.	
Finalizing the interview	<ul style="list-style-type: none"> • Is there anything else you wish to add? 	Enable the possibility of additional relevant knowledge. Make the participant feel they have had the chance to speak their mind.	

Appendix 4: Interview Guide – Swedish version

Tema	Frågor	Syfte	Teori
Introduktion	<ul style="list-style-type: none"> Förklara intervjustrukturen och tidsramen. Redogöra för etiska överväganden och anonymitet. Registrera samtycke. Fråga om nuvarande kunskap om ämnet. 	Få kontextuell information om personen, företaget som de representerar samt deras nuvarande tillvägagångssätt för öppen innovation.	(Saunders et al., 2019)
Bakgrund	<ul style="list-style-type: none"> Vänligen berätta om vad ditt företag gör, vilken roll du har och företagets huvudsakliga partners när det gäller att skapa öppen innovation? 	Få kontextuell information om personen, företaget som de representerar och deras nuvarande tillvägagångssätt för öppen innovation.	(Saunders et al., 2019)
Interna Barriärer			
Kultur	<ul style="list-style-type: none"> På vilket sätt är organisationskulturen ett hinder för öppen innovation? Vad är attityden inom företaget mot externa idéer och information? I vilken utsträckning förlitar ni er på att anställda bidrar med värdefulla innovationer jämfört med andra intressenter? Vilka åtgärder vidtar ni för att övervinna dessa hinder? 	Undersöka hur organisationskulturen påverkar möjligheten att framgångsrikt engagera sig i öppen innovation. Få insikt i hur detta problem kan hanteras.	(van der Vrande et al. 2009; Mortara and Minshall, 2011; Dubouloz et al, 2021)
Resurser	<ul style="list-style-type: none"> På vilket sätt är bristen på resurser ett hinder för öppen innovation? På vilket sätt är bristen på finansiella resurser ett hinder för öppen innovation? På vilket sätt är bristen på tid ett hinder för öppen innovation? På vilket sätt är bristen på kompetens ett hinder för öppen innovation? Vilka åtgärder vidtar ni för att övervinna dessa hinder? 	Undersöka hur bristen på företagsresurser påverkar företag att framgångsrikt engagera sig i öppen innovation. Få insikt i hur detta problem kan hanteras.	(Dubolouz et al, 2021; Lee et al., 2010; Bartello et al. 2021; Julien, 2002; Lichtenthaler, 2003; Brem et al. 2017; Laursen and Salter, 2004)

Administration & Koordination	<ul style="list-style-type: none"> • På vilket sätt är administrativa bördor ett hinder för öppen innovation? • På vilket sätt är bördor som är kopplade till koordinering ett hinder för öppen innovation? • Vilka åtgärder vidtar ni för att övervinna dessa hinder? 	Undersöka hur bördor som är kopplade till administration och koordinering påverkar möjligheten att framgångsrikt engagera sig i öppen innovation. Få insikt i hur detta problem kan hanteras.	(Bartello et al. 2021; Torchia & Calabro, 2019; Dodourova and Bevis, 2014; Maik & Wei, 2011; Kessler et al. 2007)
Summering interna barriärer	<ul style="list-style-type: none"> • Finns det några andra hinder som du har upplevt och vill lägga till? • Vilket internt hinder påverkar dig mest och varför? 	Skapa möjlighet för ytterligare relevant kunskap. Få en kontextuell förståelse för påverkan av varje hinder i förhållande till varandra.	
Extern Barriärer			
Hitta partners	<ul style="list-style-type: none"> • Vilka problem har du märkt när du söker partners att samarbeta med inom öppen innovation? • Vilken attityd har företaget mot att samarbeta med externa partners som har stora skillnader i värderingar och kompetenser? • I vilken utsträckning undersöker ni potentiella partners innan du ingår i ett partnerskap? • Har det hänt att bristen på forskning har lett till problem? • Vilka åtgärder vidtar du för att övervinna dessa? 	Undersök hur hinder för att hitta partners påverkar möjligheten att lyckas med öppen innovation. Få insikt i hur detta problem kan hanteras.	(Dubouloz et al., 2021; Bertello et al., 2021; Theyel, 2013)

Arbeta med partners	<ul style="list-style-type: none"> • På vilket sätt utgör kommunikation med partners ett hinder för öppen innovation? • Vilka utmaningar finns det för att samla in och implementera extern kunskap internt? • På vilket sätt utgör hantering och upprätthållande av partnerskap ett hinder för öppen innovation? • Vilka åtgärder vidtar du för att övervinna dessa? 	Undersök hur hinder för att arbeta med partners påverkar möjligheten att lyckas med öppen innovation. Få insikt i hur detta problem kan hanteras.	(Dubouloz et al., 2021; Vossen, 1998; Chesbrough, 2010; Spithoven et al., 2013; Sağ, Sezen and Güzel, 2016; Parida et al., 2012; van de Vrande et al. 2009. Brunswicker and Ehrenmann, 2013; Rahman and Ramos, 2010; Dodourova & Bevis, 2014)
Summering externa barriärer	<ul style="list-style-type: none"> • Finns det några andra externa hinder som du har upplevt och vill lägga till? • Vilket externt hinder påverkar dig mest och varför? 	Skapa möjlighet för ytterligare relevant kunskap. Få en kontextuell förståelse för påverkan av varje hinder i förhållande till varandra.	
Avrundning av intervju	<ul style="list-style-type: none"> • Finns det något mer du vill lägga till? 	Skapa möjlighet för ytterligare relevant kunskap. Ge deltagaren känslan av att de har haft möjlighet att säga sin åsikt.	



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