Critical Success Factors in the Offering of a Corporate-Startup Program

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MASTER THESIS

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An Exploratory Study Investigating Corporate-Startup Programs for Mature Startups in the IoT-Sector Hosted by a Global High-Technology Company

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Abstract

Company-driven initiatives to collaborate with startups are increasingly arising as a reaction to the competitive landscape of today, influenced by globalization, digitalization, and an increased demand for open innovation practices. Startups constitute a major source of innovation and have the ability to overthrow current technologies and business models. Due to vast differences, and the complementary nature, between established companies and startups, there is great potential for creating synergies when collaborating. This study focuses on formalized corporate-startup programs hosted by a global high-technology company and offered to mature startups developing solutions within Internet of Things, one of the most rapidly emerging trends within technology today. The purpose of this study is to identify the critical success factors in the offering of such a program.

In total, 15 interviews were conducted with startups, representatives from a global high-technology company, and subject matter experts, and a pre-study was conducted in order to identify relevant criteria to represent a mature startup. Based on current theory and the empirical data, ten critical success factors are identified in this study, these are: (1) to provide an initiation process that is simple and in which expectations and objectives are aligned; (2) to align intentions and consequences of providing financial support; (3) to balance the terms of the program; (4) to provide a high degree of customization; (5) to ensure a low degree of interference with the competitive edge of the startup; (6) to focus the program around the unique selling point of the global high-technology company and IoT-specific support; (7) to support the startup to gain legitimacy and credibility; (8) to provide learning opportunities; (9) to provide a business context; and (10) to provide access to IoT markets.

Keywords: Corporate-Startup Program, Corporate-Startup Engagement, Open Innovation, Global High-Technology Company, Mature Startup, Internet of Things

Sammanfattning

Företagsdrivna initiativ att samarbeta med startup-företag blir alltmer förekommande. Detta är till följd av det rådande konkurrenslandskapet som karaktäriseras av globalisering, digitalisering och ett ökat behov av öppen innovation i etablerade företag. Startup-företag anses vara en betydande källa till innovation och dessa aktörer besitter förmågan att revolutionera rådande teknologier och affärsmodeller. Eftersom etablerade företag och startup-företag är olika till sin natur och har möjlighet att komplettera varandra, finns det stor potential att åstadkomma ett samarbete som gynnar båda parter. Denna studie fokuserar på formaliserade samarbeten mellan globala högteknologiska företag och mogna startup-företag inom *Internet of Things*-sektorn. Syftet med studien är att identifiera kritiska framgångsfaktorer i erbjudandet för ett samarbetsprogram mellan dessa parter.

För att undersöka kritiska framgångsfaktorer i ett samarbetsprogram genomfördes först en kvantitativ förstudie för att identifiera kriterier för mogna startup-företag och sedan genomfördes 15 intervjuer med sex mogna startup-företag inom *Internet of Things*-sektorn, fyra representanter från ett globalt högteknologiskt företag samt fem experter inom området. Baserat på teori och den empiriska datan identifieras i studien tio kritiska framgångsfaktorer, vilka är: (1) processen för att initiera samarbetet är enkel och inkluderar att målen och förväntningarna från båda parter stämmer överens, (2) koordinera målen och konsekvenserna av att erbjuda finansiellt stöd, (3) villkoren för programmet är anpassade efter båda parters fördelar och risker, (4) programmet är specifikt anpassat efter varje startup-företag, (5) startup-företagets konkurrensfördelar påverkas inte negativt av programmet, (6) fokusera programmet kring utveckling av produkter och tjänster inom IoT samt kring det globala högteknologiska företagets unika styrkor, (7) hjälp startup-företaget att öka sin trovärdighet och legitimitet under programmet, (8) skapa möjligheter för lärande i programmet, (9) hjälp startup-företaget att bygga ett affärssammanhang under programmet, och (10) hjälp startup-företaget att nå marknader och kunder relaterat till produkter och tjänster inom IoT.

Nyckelord: Corporate-Startup Program, Corporate-Startup Engagement, Öppen Innovation, Globalt högteknologiskt företag, Mogen Startup, Internet of Things

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Abbreviations

B2B	Business-to-Business
GHTC	Global High-Technology Company
IoT	Internet of Things
IP	Intellectual Property
NDA	Non-Disclosure Agreement
PR	Public Relations
R&D	Research and Development
ROI	Return on Investment
USP	Unique Selling Point

Definitions

Company (Blank, 2014)	A permanent organization designed to execute a repeatable and scalable business model
Corporate-Startup Program	A collaborative program offered by an established company to startups that fulfills three criteria: 1. The program is more extensive than an event 2. The offering from the established company includes more elements than solely financial capital 3. During the whole program, the two parties are separable entities, thus the startup is not acquired by the established company
Critical Success Factor in an Offering of a Corporate-Startup Program	A factor in the offering of a corporate-startup program, hosted by a global high-technology company, that is critical in order to attract mature startups in the IoT-sector and enable them to develop and grow, as well as enabling the hosting company to achieve a beneficial outcome
High-Technology Company (Hecker, 2005; Mohr et al., 2010)	A company that engages in the design, development and introduction of new products and production processes, which are based on advanced and cutting-edge technology

Internet of Things (Hussain, 2017)	The interconnectivity of things used to sense and report real world information
Mature Startup	A startup that fulfills three out of the following four criteria:

1. The startup has defined and validated its business concept
2. The startup has generated revenue from paying customers in the last twelve months
3. The startup has generated less than 1 MSEK in revenue in the last twelve months. The revenue is from paying customers, not funding or grants
4. The startup has lost less than 20 % equity to external investors

Offering of a Corporate-Startup Program	The value provided to a startup from an established company in terms of assets, resources, services. and activities in a corporate-startup program, as well as the design parameters of such a program that directly impact the participating startup
Startup (Blank, 2014; Radojevich-Kelley & Hoffman, 2012)	A temporary organization designed to search for a repeatable and scalable business model, which is established in an uncertain and volatile environment with the intent to bring a new opportunity to the marketplace

1 Introduction

This chapter introduces the reader to the background to the research field and the background to this master thesis. Furthermore, this chapter presents the issue of study, the purpose, the research question as well as the delimitations of this study. Lastly, it gives the reader an outline of the thesis, with a summary of each chapter.

1.1 Background to Research Field

As a reaction to the competitive landscape of today, influenced by digitalization and global competition, and the increased demand for extended innovation practices in large technology-based companies, new company-driven initiatives are being established. As part of that, formalized engagements and programs to approach and collaborate with startups are arising (Becker & Gassmann, 2016a; Kohler, 2016).

Today, digital technologies largely impact societies and economies. The impact of digital technologies will continue to increase, and it is indicated that companies will develop over the next decades to become predominantly digitized (OECD, 2016). One of the most rapidly emerging trends in technology of today is Internet of Things (IoT). IoT is described as a mega trend with potential to impact the whole business spectra (Hussain, 2017; OECD, 2016; Panetta, 2017a; Wagner, 2018). IoT enables physical devices to be connected to the internet through sensors, and from this information can be collected and analyzed (Hussain, 2017). Furthermore, IoT will enable a digitally responsive society, deeply impact and revolutionize all sectors, and is suggested to give companies a distinct competitive advantage during the next decade. As a consequence, there is an ongoing evolution of technologies surrounding IoT (OECD, 2016; Panetta, 2017b; Wagner, 2018). OECD (2016) consider that the number of IoT devices will increase from one billion in 2016 to 14 billion by 2022. Further, Panetta (2017b) suggests that IoT will be used in 95% of new electronic product designs by 2020, and according to Wagner (2018) *everything will be affected by IoT*.

The shift of companies becoming more digitized, and the impact it has on societies and economies, affects the environment in which companies compete. The

competitive environment of today is characterized by rapid development of technologies, shortened product life cycles and intensified global competition characterized by the globalization of technologies, industries, and markets (Becker & Gassmann, 2006a; Lau, Schuh, Vogt, & Zimmermann, 2017). These conditions make it critical for companies, and especially highly digitized businesses, to change and be innovative in order to stay competitive and achieve long-term success (Chesbrough & Weiblen, 2015; Lau et al., 2017; Mocker et al., 2015).

Furthermore, in technology-driven companies, research and development (R&D) departments have traditionally constituted a major source of innovation, and thus given these companies a competitive advantage. However, these companies are increasingly using their R&D budgets to take advantage of external sources of innovation such as customers, universities, and research institutes (Becker & Gassmann, 2006a). The paradigm of harnessing external innovations was introduced by Chesbrough (2003a) as *open innovation.* Open innovation is a way for companies to innovate using sources outside the boundaries of the firm, not merely internal R&D, and thus using outside and external resources to innovate and to complement their internal resources (Chesbrough, 2003b). Industries characterized by high-technology, described by Mohr, Sengupta and Slater (2010, p.9) as *cutting-edge or advanced technology*, have been pioneers in using open innovation (Chesbrough, Enkel, & Gassmann, 2010). The need for companies to engage in activities to promote open innovation has grown strong because of their rigid nature inhibiting certain innovation practices (Hill & Rothaermel, 2003).

Formalized engagements and programs to approach and collaborate with startups are examples of company-driven initiatives that are being established as a reaction to the competitive landscape and the increased demand for open innovation (Becker & Gassmann, 2006a; Kohler, 2016). According to Mocker et al. (2015), collaborations between established companies and startups is an increasingly used practice. Engagements with startups have, especially in the high-technology industry, become an increasingly important mean for established companies to innovate (Bannerjee, Bielli, & Haley, 2016; Chesbrough & Weiblen, 2015; Kohler, 2016). The emergence of corporate-startup collaborations is driven by the fact that startups constitute a major source of innovation and their innovation activities have potential to overthrow current technologies and business models, and thus large companies need to respond quickly (Bannerjee et al., 2016; Kohler, 2016).

The rise of startups is currently palpable. This is mainly due to the rise of digitization, the extensive support system for startups that exists today, and the access to new methods and techniques to build and grow a startup, such as the Lean Startup method (Chesbrough & Weiblen, 2015). However, it is evident that it is

challenging to succeed as a startup and statistics shows that only about half of new ventures survives more than five years in Sweden and Denmark (Eurostat, 2018).

Moreover, due to vast differences between large companies and startups, there is great potential for creating synergies when collaborating. The differences imply that the two parties can complement and learn from each other and develop their businesses (Chesbrough & Weiblen, 2015; Kohler, 2016; Mocker et al., 2015). In order for established companies in high-technology businesses to leverage a collaboration with startups, in the currently emerging IoT-field, further insight is needed in order to understand what drives the success of a corporate-startup program.

1.2 Background to Master Thesis

This master thesis is conducted in collaboration with a global high-technology company, referred to as *the case organization*. The case organization is further described in Appendix A. The master thesis has been conducted as part of an initiative in the case organization to expand their internal innovation activities and engage with external startups. Specifically, the case organization is focusing on collaborations with startups in the IoT-sector. As part of this initiative, a corporate-startup program will be established and offered to external startups.

As this thesis is conducted, the case organization aims to refine the target group for the corporate-startup program and understand what the needs, challenges and demands are for the startups they are targeting. This is done in order to thoroughly understand what the case organization can offer in order to help them develop and grow. Further, the case organization wishes to examine how they best can contribute to startups, based on their assets, resources, and capabilities. This will, hopefully, enable the case organization to offer an attractive and competitive value proposition to the startups the company aims to target. This master thesis is conducted as a part of the process to achieve the intentions of the case organization, whilst also extend current literature in the field of corporate startup engagements between large high-technology companies and startups in the IoT-sector.

1.3 Issue of Study

The significance of studying corporate-startup programs is evident, due to the potential value these programs can bring to both parties and the difficulty in

pursuing this task (Chesbrough & Weiblen, 2013; Kohler, 2016). The topic of collaborations between large companies and startups is new both in practice and in literature. Thus, the literature in the field is limited and especially, current scientific theory is lacking (Thieme, 2017). The literature in this field is especially scarce regarding corporate-startup programs targeted toward mature startups, and startups in the IoT-sector.

Further, the relevance of corporate-startup programs, as well as the understanding of how large corporations can engage with startups, are rapidly growing and developing. In the technology industry in particular, multiple new ways of engaging with startups have been established in recent years (Chesbrough & Weiblen, 2013). In addition, corporate-startup programs can be set up in different ways and take different forms (Chesbrough & Weiblen, 2013; Mocker et al., 2015). Thus, this thesis aims to expand the current literature, by providing a deeper understanding of corporate-startup programs offered by global high-technology companies to mature startups in the IoT-sector.

In this master thesis, the focus is on global high-technology companies, and what they can offer to mature startups in the IoT-sector in the form of a corporate-startup program in order to attract them and enable them to grow and develop. The case organization is used in this study to represent global high-technology companies. Mature startups in the IoT-sector are studied because this is the target group identified as being of high interest for the case organization, and thus presumably for other high-technology companies aiming to establish corporate-startup programs as well.

1.4 Purpose

The purpose of this master thesis is to provide an extended perspective and deeper understanding of collaborations between global high-technology companies and mature startups in the IoT-sector. Specifically, the purpose is to explore the critical success factors in the offering of a corporate-startup program, in order for the global high-technology company to attract mature startups in the IoT-sector and to enable them to develop and grow, as well as enabling a beneficial outcome for the hosting company itself.

1.4.1 Research Question

The purpose of this master thesis will be attained by answering the research question:

> *Which are the critical success factors in the offering of a corporate-startup program for mature startups in the Internet of Things-sector hosted by a global high-technology company?*

1.5 Delimitations

This study is carried out as a master thesis project with a predefined time frame of 20 weeks. The scope and depth of the study have been adjusted to fit this time frame. More specifically, the time constraint has limited the researchers in the number of dimensions for a corporate-startup program studied, in the amount of primary data collected, and the methods for collecting primary data.

This study only focuses on how an established global high-technology company could design its offering in a corporate-startup program in order to meet the needs, challenges and demands of mature startups in the IoT-sector. Thereby, the study does not cover other dimensions of a corporate-startup program such as internal prerequisites within the hosting company, what the external startups would have to give the established company in return if they would part-take in the program, e.g. equity, and the execution of the process to establish and run the program.

All of the primary data has been collected from interviewees located in the Greater Copenhagen Area.

Data for this study has been collected from one established high-technology company that have global presence, and startups in the IoT-sector that fulfill three out of the following four criteria: (1) have paying customers but less than 1 MSEK in revenue from the last twelve months, (2) have lost less than 20 % of equity to external investors, (3) have a defined and validated business concept, and (4) are located in the Greater Copenhagen Area. Thus, the results stemming from this study will only be applicable for established companies and startups that fulfill the above stated criteria. These criteria have been selected as a result of a pre-study conducted by the researchers.

1.6 Thesis Outline

Chapter 1: Introduction

This chapter introduces the reader to the background to the research field and the background to this master thesis. Furthermore, this chapter presents the issue of study, the purpose, the research question as well as the delimitations of this study. Lastly, it gives the reader an outline of the thesis, with a summary of each chapter.

Chapter 2: Method

This chapter describes and motivates the research strategy and design that has been undertaken in order to conduct this research. Further, this chapter presents the method used for data collection as well as the data analysis. Furthermore, the work process is described, including the pre-study and literature review. Lastly, the trustworthiness of the study is discussed.

Chapter 3: Theoretical Framework

This chapter lays the foundation for theoretical perspective, based on current literature and research. Presented theory is related to innovation, challenges for established companies to radically innovate, startup and their challenges to grow and develop. Further, theory is presented regarding startup support institutions and corporate-startup programs and how startups and established companies can contribute value to each other through a corporate-startup program, including the opportunities and risks that this venture may imply. Lastly, elements and design parameters in an offering of a corporate-startup program are presented.

Chapter 4: Empirical Findings

This chapter presents the empirical findings, based on the collected data from the in-depth semi-structured interviews. The empirical findings are categorized based on three perspectives: the perspective of the startups, the perspective of the case organization, and lastly the perspective of the subject matter experts.

Chapter 5: Analysis and Discussion

In this chapter, identified themes related to the offering of a corporate-startup program for mature startups in the IoT-sector, hosted by a global high-technology company are analyzed and discussed with regards to identified issues and patterns in the empirical data and the current literature.

Chapter 6: Conclusions

This chapter presents the conclusions of this master thesis, including the critical success factors for a corporate-startup program for mature startups in the IoT-sector hosted by a global high-technology company, together with contributions to theory and practice. Moreover, suggestions to further research are presented

2 Method

This chapter describes and motivates the research strategy and design that has been undertaken in order to conduct this research. Further, this chapter presents the method used for data collection as well as the data analysis. Furthermore, the work process is described, including the pre-study and literature review. Lastly, the trustworthiness of the study is discussed.

2.1 Research Strategy and Design

As the research field currently is rather unexplored, the research conducted in this study is of exploratory character, and thus the most appropriate research approach for this study is qualitative and abductive. The exploratory, the qualitative, and the abductive research approach are further described below along with a detailed motivation to why this specific strategy has been chosen. Furthermore, a case study design has been chosen, which is also described in detail below.

2.1.1 Exploratory Research Approach

Based on the characteristics and the objective of the research, the research can be either exploratory, descriptive, explanatory or problem-solving (Höst, Regnell, & Runeson, 2006). This study is characterized as exploratory research, as the purpose is to explore and discover an unknown phenomenon, to deeply understand this phenomenon, and to contribute with new insights (Höst et al., 2006; Robson, 2002; Rosengren & Arvidsson, 2002). The exploratory research approach becomes especially evident in the initial part of the research process, which was dedicated for understanding and exploring the topic. In order to do this, and to understand the existing issues related to the topic of corporate-startup programs, the researchers participated in meetings with external experienced people in the field as well as with startups. The experienced people in the field came from different startup support institutions such as The Ground, Accelerace, Copenhagen Capacity, and MINC. These meetings were hosted by the case organization. One of the identified topics of interest was the offering from a global high-technology company to startups, which then was decided to be the focus of the study.

2.1.2 Qualitative Research Approach

As this research is exploratory, and the researched topic is unexplored and there is limited previous research in the area, a qualitative research approach was chosen (Bryman & Bell, 2005; Hennink, Hutter, & Bailey, 2011; Rosengren & Arvidsson, 2002). Qualitative research, in contrast to quantitative research, emphasizes context and meaning of words rather than quantifiable matter (Höst et al., 2006; Marshall & Rossman, 1999). Further, a qualitative approach is applied as it enables the researchers to obtain a deep and nuanced understanding of what is studied, to understand the experiences of the participants in the study, and to identify issues based on their perspective (Hennink et al., 2011).

Further, the design of the research approach is flexible, rather than fixed, since the research is qualitative and exploratory. A flexible design develops and adapts as the study proceeds, and the focus of the study can change during the process of conducting the study (Höst et al., 2006; Robson, 2002).

2.1.3 Abductive Reasoning Approach

The reasoning approach of a study can be either inductive, deductive or abductive. A deductive reasoning approach is based on theory and from there, hypotheses are derived. Subsequently, data is collected, and the results are used to confirm or reject the hypotheses. In contrast, an inductive reasoning approach generates theory, which means that new theory is the result from the research process (Bryman & Bell, 2005). An abductive reasoning approach contains characteristics from both the deductive and inductive approach. It is a flexible approach that combines generation of new theory and testing toward existing theory, and conclusions are drawn based on comparison of patterns and explanations found in existing literature as well as in the collected data (Starrin & Svensson, 1994; Wallén, 1993).

In this study, the aim is to explore and understand a field that currently lacks scientific research and therefore, an abductive reasoning approach is recommended (Starrin & Svensson, 1994). When constructing theory in this study, empirical data is collected, analyzed and compared to current literature in order to identify how the empirical findings compare to the current theories and how the findings can extend it. Further, existing theory is used in the empirical data collection as it constitutes the foundation of the interview guides and the list of recommended elements to provide to startups that was used in the interviews. This list and the interview guides can be found in Appendix B. However, since the focus of this study, collaborations between mature startups in the IoT-sector and GHTCs, is unexplored the theory used is for startups and established companies in general. Therefore, the researchers

emphasized the interpretations and views of the participants in the empirical data collection and analysis, in order to generate theory.

2.1.4 Case Study Design

In this study, a case study design was chosen as the study is characterized by research of a contemporary phenomenon within its context and the studied phenomenon is not readily distinguished from its context (Robson, 2002; Rosengren & Arvidsson, 2002; Yin, 2003). This study aims to the phenomenon of a corporate-startup program hosted by a GHTC and offered to startups. Further, case studies are suggested to be appropriate when the study applies an exploratory research approach (Höst et al., 2006).

There are different types of case studies and this study is an exploratory single-case study. This means that it is based on a single case, and that it aims to investigate issues that are uncertain and needs to be further clarified (Yin, 2003).

Qualitative methods allow the researcher to investigate a particular case in detail, thus these are commonly used in case study designs (Bryman & Bell, 2005). Interviews are a common method for data collection in case studies (Höst et al., 2006). The case study design includes an overlapping procedure between data collection and analysis, which enables modifications of the data collection methods and a more effective analysis (Eisenhardt, 1989). In a case study the conclusions are not directly generalizable, but another case with more similar conditions have a higher likelihood to result in similar conclusions (Höst et al., 2006).

2.2 Data Collection

In order to answer the research question of this master thesis data was collected from three sources. The sources from which data has been collected are: (1) representatives from startups that have been identified to be in the target group of this study, (2) representatives from the case organization, and (3) experts in the field of corporate-startup collaborations and engagements (subject matter experts). Semi-structured in-depth interviews has been used in order to collect data for this study from these sources.

2.2.1 Semi-Structured In-Depth Interviews

In order to collect information from mature startups in the IoT-sector, case organization representatives, and subject matter experts, semi-structured in-depth interviews were conducted. In-depth interviews are described by Hennink et al. (2011, p.109) as *a conversation with a purpose* and this method was chosen because it allows the researchers to capture people's individual stories and collect information regarding the interviewee's personal experiences of the topic. This enables the researcher to investigate the topic from the perspective of the interviewee (Hennink et al., 2011). Further, there are three different types of interview formats for data collection: (1) fully-structured, (2) semi-structured, and (3) unstructured (Robson, 2002). Semi-structured interviews are a widely used method in exploratory qualitative research, and it was chosen because it allows the researchers to have predetermined questions but use them in a flexible manner (Bryman & Bell, 2005; Hennink et al., 2011; Robson, 2002). In a semi-structured interview, the predetermined order and wording can vary depending on situations during the interview, and questions can be disregarded or added if necessary (Bryman & Bell, 2005; Robson, 2002).

When collecting data through semi-structured in-depth interviews, the data was collected through a three-step process. First, three interview guides were created, one for each source of data. Secondly, participants were selected and recruited. Thirdly, the interviews were held. This process is further described below.

2.2.1.1 Interview Guides

When conducting interviews, the interviewee uses an interview guide for guidance and to structure the interview around (Bryman & Bell, 2005). In this study, three interview guides were developed, one for each source of data. These can be found in Appendix B. The interview guides used in this study consist predominantly of open-ended questions and few closed questions, which is in accordance with the guidelines for exploratory interviews provided by Höst et al. (2006). Throughout the interview, probes were used to gain detailed information on topics of interest and thoroughly understand the perspective of the interviewee. Since the questions were open, probes remind the interviewer to ask about specific interesting areas of interest (Hennink et al., 2011).

Furthermore, the interview guides had the proposed structure of Hennink et al. (2011), i.e. introduction, opening questions, key questions and closing questions. During the introduction, the researchers introduced themselves and their project, and brought up confidentiality, anonymity and audio recording. Thereafter, opening questions were asked to allow the interviewees to introduce themselves and feel comfortable. The key questions are the questions that are directly related to the

research topic and were the central part of the interview. The closing questions were broader questions aimed to reduce the rapport and disconnect the interviewer and the interviewee (Hennink et al., 2011).

Further, a list of suggested resources, services and activities offered by an incumbent company to a startup was created, which will be further explained in 2.4.2 Literature Review, and was used as part of the interviews.

2.2.1.2 Selection and Recruitment of Participants

According to scholars, the selection of participants for a research should be based on the specified research question, and the participants chosen should have the experience of interest and able to provide relevant and detailed information to the study. Further, participants should represent a variety of experiences (Hennink et al., 2011; Magnusson & Marecek, 2015). Hence, the study population for the three data sources were defined accordingly. Specifically, for startups, the study population was defined based on the predetermined criteria identified in a pre-study, as depicted in 2.4.1 Pre-study.

To select the interviewees within each study population, a method similar to the *purposive selection method* described by Hennink et al. (2011) was used. This means that it was done in a deliberate and flexible manner, which imply that interview objects were chosen on purpose, based on their relevance and knowledge in the studied topic, and that a variance of participants with different experiences on the topic was sought. Further, a flexible approach implies that the choice of interview objects can be modified and refined during the research process (Hennink et al., 2011). Furthermore, *snowball sampling* or *chain referral sampling* was used to scout and select interviewees, which is an approach where the researcher make contact with a small number of people that are relevant for the study and subsequently uses these to make contact with other potential participants (Bryman & Bell, 2005). In all interviews, the interviewees were asked if they wanted to recommend other interesting study objects.

In this study, 15 semi-structured in-depth interviews were held. In particular, six were help with startups, four were held with representatives from the case organization and five were held with subject matter experts. The number of participants aimed to be based on when information saturation was reached in each study population, i.e. when collected information began to repeat itself, as recommended by Hennink et al. (2011). However, an additional contributing factor to the number of interviewees was the limited time frame. According to Magnusson & Marecek (2015), the number of interviewees depends primarily on the research questions to be answered and further, it depends on the scope of each interview, and

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how detailed analysis that will be made. If there are in-depth interviews and the analysis of the interviews will be thorough, a small number of participants can serve its purpose (Magnusson & Marecek, 2015). Since this study is qualitative, the depth of information and variation of experiences is valued rather than a high number of participants.

When recruiting startups, the researchers did their own research using online databases for accessing the startup ecosystem, mainly *Crunchbase*, *Nordic Tech List, Gust*, *and The Hub* were used. Further, institutions that work with, or close to, startups were asked for recommendations. These institutions were Copenhagen Capacity and LU Innovation at Lund University. An introductory email was sent to those startups that seemed be in the defined target group, and they were asked to specify if they fulfilled the criteria for a mature startup in the IoT-sector. Initially, the researchers had an aim that all of the identified criteria should be satisfied. However, it became evident that very few startups realized that. Consequently, the study population was modified so that only three out of the four criteria defining a mature startup must be fulfilled. However, the startup needed to be active in the IoT-sector to be considered relevant for the study.

When recruiting subject matter experts, the researchers did their own research using LinkedIn as well as asked for recommendations from people in the industry and other interviewees. An introductory email was sent to interesting people and their experience in the research field was confirmed. When recruiting subject matter experts, the aim was to select experts with highly diversified experiences and professional roles, e.g. from academia, experienced consultants in the field of corporate-startup programs, and people with experience from both startups and large companies.

The employees interviewed from the case organization were individuals that were considered relevant for the studied corporate-startup program initiative. Further, it was taken into consideration that members with different roles and responsibilities was one determining factor when selecting the participants, in order to capture the full range of experiences when studying an organization (Magnusson & Marecek, 2015). As Kohler (2016) suggests, managers play a vital role when designing a corporate-startup program, and their understanding of the initiative is of high importance. Therefore, this was taken into account when choosing the interviewees for the study representing the case organization.

2.2.1.3 Conducting Interviews

The 15 interviews held, lasted for approximately one hour each. Fourteen of the interviews were conducted in person and two were conducted over Skype. Further,

twelve of the interviewees were conducted by two interviewers whilst four was conducted by one interviewer. The in-depth interviews were held with one interviewee at a time, as recommended by Hennink et al. (2011). A full list of interviewees can be found in Appendix C.

During the interviews, the interviewers applied the principles suggested by Robson (2002), Fitzpatrick (2014) and Hennink et al. (2011). According to Robson (2002), the aim for the interviewer in a semi-structured interview is to make the interviewee speak freely and openly. However, the ability of the interviewee to do so is often affected by the interviewer and their behavior during the interview. Hence, during this study, the interviewers aimed to listen more than they spoke themselves and to ask questions in a straightforward fashion during the interviews. Further, Fitzpatrick (2014) introduce the technique inspired by *The Mom Test,* an interviewing technique used when learning from customers in an innovation process. This technique aims to dig beneath ideas and superficial answers and ask the interviewee why they require what they claim to require or why they want or do not want something. This was done in order to gain a deeper understanding of the interviewees and their answers. Lastly, Hennink et al. (2011) emphasized the need to establish rapport and a connection between the interviewer and the interviewee in an in-depth interview and thereby, the researchers aimed to accomplish that.

Furthermore, when interviews are used as a method for data collection in a qualitative study, these should be audio recorded and transcribed (Höst et al., 2006). Thus, this was done for all of the interviews in this study. Transcription was done manually for some interviews and for others a service called Reportex, which transcribes audio files automatically, was used. Subsequently, the transcribed material was reviewed by the interviewers and relevant areas was identified and compiled.

2.3 Data Analysis

In order to analyze the empirical data collected from the in-depth interviews, a qualitative data analysis process was undertaken. This analysis process is based on the broad principles of qualitative data analysis as suggested by Hennink et al. (2011). The process is described below.

First, all of the conducted interviews were transcribed and anonymized. Transcription involves preparing a written record of all of the interviews (Hennink et al., 2011). Subsequently, codes were developed in order to index the empirical

data documented in the transcriptions. As this study is conducted using an abductive reasoning approach, the codes that were used are based on both deductive and inductive concepts, as suggested by Hennink et al. (2011). This implies that codes were both derived from theoretical concepts presented in section 3 *Theoretical Framework*, i.e. deductive codes, as well as topics, ideas, and opinions that the researchers identified as commonly mentioned in the empirical data, i.e. inductive codes. The inductive codes were identified while the researchers were processing the empirical data, as suggested by Hennink et al. (2011). The process of developing codes resulted in 47 codes, which was the number of codes needed in order to reach saturation, meaning that all of the relevant empirical data could be indexed by a code.

Successively, the codes were defined in a codebook in order to establish a common understanding for the meaning of the codes. This enabled a more objective understanding and application of the codes by the two researchers and thereby limiting the risk of subjective interpretations of the codes. The codebook with the 47 codes can be found in Appendix E, together with descriptions and if they were derived in a deductive or inductive manner. Subsequently, all the empirical data was coded using the defined codes in the codebook. This was done in the software tool NVivo, designed for analyzing qualitative data.

Subsequently, the coded data was categorized into themes by clustering the codes. From the coding process, it was evident that nearly all of the codes were used by each of the three perspectives (i.e. startups, case organization, subject matter experts), thus the issues brought up by the different perspectives were overlapping to a large extent. In the codebook, found in Appendix E, a presentation of the perspectives that mentioned the codes is included. Therefore, when clustering the codes into themes, the researchers did not consider which perspectives that mentioned the specific code. The clustering was based on how the codes were interlinked and with regards to the identified patterns in the data, meaning that codes were grouped into themes based in their common characteristics and interconnectedness. When all of the codes had been clustered into a category of codes, ten themes had been developed.

Thereafter, the categories of codes, i.e. the themes, were analyzed based on the empirical data indexed by the relevant codes and relevant theory and current literature. Specifically, the themes and the patterns within them were analyzed, discussed and compared to current literature. The developed themes, together with the theories from current literature, are the foundation for the critical success factors of the study, contributing to developed theory.

2.4 Work Process

In this study, the work process has been conducted similarly to the framework for conducting qualitative research described by Hennink et al. (2011). The work process for this study is depicted in Figure 2.1 below. Hennink et al. (2011) emphasize the iterative nature of qualitative research and thus, the tasks are conducted intertwined in this study.
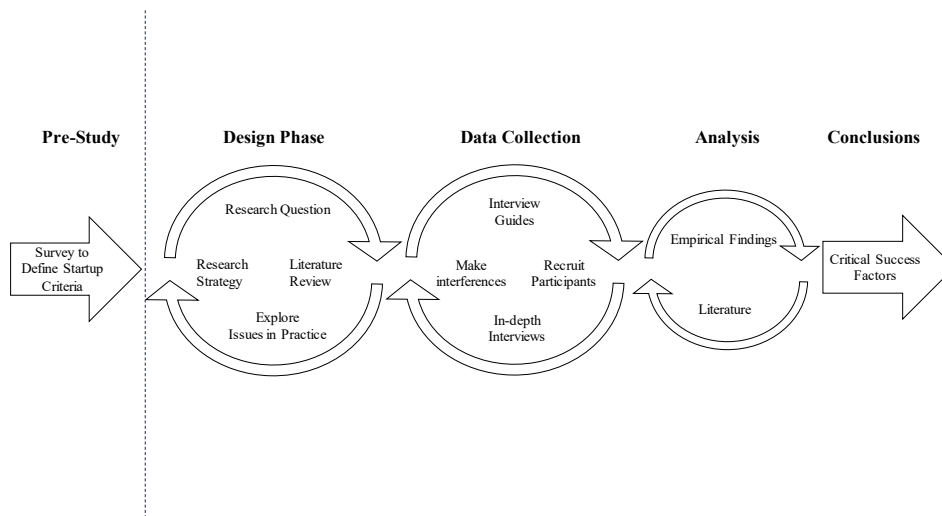
Figure 2.1. The work process

The first phase, including a pre-study is thoroughly described below, section 2.4.1 *Pre-Study*, and was conducted in order to define the target group of startups to focus on.

The design phase aimed to define the approach and focus for the study. As part of this, a literature review was conducted and is further described below, section 2.4.2 *Literature Review*. The focus of the study was decided by reviewing current literature in the field as well as exploring issues in practice, by participating in meetings with experienced people in the field as well as with startups as depicted in 2.1.1 *Exploratory Research Approach*. The phase resulted in a research question, depicted in section 1.4.1 *Research Question*, a strategy for how the research will be conducted, depicted in section 2.1 *Research Strategy and Design* and a theoretical framework, depicted in section 3 *Theoretical Framework*. However, these were reviewed, modified and extended in an iterative manner, as recommended by Hennink et al. (2011).

The data collection phase included conducting semi-structured in-depth interviews with three sources, i.e. startups, case organization representatives and subject matter experts. This process is thoroughly described in section 2.2 *Data Collection.* Interferences were made during the data collection process in an inductive manner, as recommended by Hennink et al. (2011), and resulted in developments and modifications of the research, as this study has a flexible approach.

The analysis phase is further described in section 2.3 *Data Analysis* and consists of a process where the empirical findings were coded, based on inductive and deductive codes, and categorized based on common characteristics and interconnectedness, into themes. These themes were subsequently analyzed and discussed, with regards to the patterns within the empirical findings and current theory.

The conclusion phase includes proposed critical success factors for a corporate-startup program for mature startups in the IoT-sector, hosted by global high-technology companies.

2.4.1 Pre-Study

As a prerequisite to conduct this research, the target group of startups had to be determined, in order to collect primary data for the study. Therefore, the researchers created a quantitative survey, which was distributed within the case organization to 18 employees whose opinion were of relevance for the corporate-startup program initiative, and answers were collected from 16 employees. The outcome of the quantitative survey was compiled and resulted in five criteria that startups in this study need to fulfill.

The aim of the survey was to identify the determining characteristics of the startups in the target group. These characteristics would also help to define the development stage of the startups to be studied. The identified characteristics became the selection criteria that the startups in this study should fulfill in order to be considered part of the accepted sample to focus the primary data collection on.

The survey can be found in Appendix F and the resulting selection criteria used to characterize the relevant startups were:
- Business concept is defined and validated
- The startup has generated revenue from the last twelve months. The revenue is from paying customers, not funding or grants

- The startup has generated less than 1 million SEK in revenue from the last twelve months. The revenue should be from paying customers, not funding or grants
- The startup has lost less than 20 % equity to external investors

The selection criteria were essential to establish in order to conduct the study as the challenges for startups are vastly different depending on the stage that the startup is in and will therefore affect the offering from the large company. Thus, the selection criteria were used to narrow down the sample.

Generally, a survey is considered being an advantageous method to use in order to collect data fast and efficiently. Further, surveys tend to have few open-ended questions, be short and focused to make it easy for the respondent to understand the questions in the survey (Bryman & Bell, 2005). Hence, a survey was used for the pre-study because of its efficiency as well as the closed nature of the questions, which allowed the researchers to collect quantifiable data about the case organization representative's opinions.

As seen in Appendix F, the survey consisted of 13 questions asking about specific selection criteria, one open-ended questions that allowed the respondents to add additional criteria and subsequently, the respondents were asked to prioritize the five most relevant criteria. Lastly, two open-ended questions gave the respondents the chance to add any specifically important issue, i.e. a "deal-breaker" for collaboration with a startup, respectively any comment to the survey or their answers. For each question, one option was "I don't know" and another was "I am indifferent", as recommended by Lekvall and Wahlbin (2001). Drawbacks of using a survey is that the respondents are not able to ask follow-up questions and the respondent might miss important questions (Bryman & Bell, 2005). Therefore, the survey was formulated with clear explanations of its purpose and the meaning of all questions respectively, to ensure reliable answers.

According to Robson (2002), the variables to seek information on in a survey can be determined by previous studies and by investigating what variables that are suggested through e.g. interviews. In order to identify the selection criteria used in the survey and their corresponding alternatives, literature was reviewed, and a list of criteria used for defining and describing startups in different stages was compiled. This list of selection criteria was subsequently validated and refined during unstructured interviews with experts in the field and one startup, in order to confirm that the criteria selected from literature were relevant and applicable. Experts are commonly used in the creation of a survey (Rosengren & Arvidsson, 2002) and the expert used to create this survey are active in, and have extensive experience of,

startup development programs, i.e. from Copenhagen Capacity and Accelerace. The list was thereafter refined and was then put into the form of a survey with close ended questions. Before the survey was distributed, it was reviewed by peers and an employee at the case organization.

2.4.2 Literature Review

Current literature related to the researched topic has been used throughout the study and resulted in the theoretical framework presented in chapter 3 below. A literature review was performed for two reasons. Firstly, to gain a deep understanding of the research field, and secondly to compare and relate current literature with the empirical findings. First, the understanding of the field allowed the researchers to place the study in the context of existing literature and to guide the research design, i.e. the research questions, research strategy and conceptual design (Hennink et al., 2011; Yin, 2003). Second, theory and literature were used intertwined with the collected empirics, to contribute to the findings as recommended by Walleén (1993) and Yin (2003). Specifically, current literature was used as part of the data collection and it was also incorporated in the analysis of the collected data.

In an exploratory manner, the literature review was performed by identifying relevant key words in the field of study and performing literature searches using mainly LUBSearch, a database hosted by Lund University, and the search engine Google Scholar. Throughout the literature review process, new relevant keywords were identified, which resulted in further literature searches. Also, the references used in identified literature was used as a source for additional literature searches. This iterative process was performed until no new relevant information was found. As part of this process, relevant literature and concepts were mapped, in order to get an overview of the existing literature in the field.

One aim of conducting the literature review was to compile what resources, services and activities offered to startups by companies and other startup support other startup support institutions in a corporate-startup program that were suggested in literature. To do so, relevant literature was reviewed and mentioned resources, services and activities were identified until saturation was reached, and these elements were subsequently compiled into a list. The list can be found in Appendix B. The list was used at one stage, in all interviews. When asking about critical elements offered by a GHTC to mature startups in the IoT-sector, the interviewees first answered based on their preconceived perception and subsequently, based on their perception after reviewing the list based on literature. The purpose of this was to integrate existing theory, so that empirical findings and existing theory is

combined when new theory is generated, as recommended by Wallén (1993) in an abductive reasoning approach.

2.5 Trustworthiness of Study

Trustworthiness refers to the degree of confidence in the collected data, the interpretations of the data and the methods used (Connelly, 2016). In qualitative research, trustworthiness is used to evaluate and measure the quality of the research. Trustworthiness consists of four aspects: (1) credibility, (2) transferability, (3) dependability, and (4) confirmability (Guba, 1981).

2.5.1 Credibility

Credibility refers to the truth value of the research, i.e. the confidence in the truth of the derived results (Connelly, 2016; Guba, 1981). One method to enhance the credibility of a study is *peer debriefing*, where the researchers seek to test the insights gained during the study by interacting with professionals in the field (Connelly, 2016; Guba, 1981). In this study, the researchers regularly discussed with the supervisor from the university as well as the supervisor from the case organization.

Moreover, triangulation is one method to enhance the credibility of a study (Guba, 1981). Triangulation generally refers to cross-checking the interpretations and data by using multiple sources of data, and different investigators and methods (Guba, 1981). In this study, triangulation was performed by collecting data from three different data sources, i.e. startups, the case organization, and subject matter experts, in order to enhance the credibility of the results.

2.5.2 Transferability

Transferability refers to the applicability of the research, i.e. the extent to which the results of a study can be applied in alternative settings (Connelly, 2016; Guba, 1981). In qualitative research, transferability is comparable to generalizability (Connelly, 2016). Firstly, the transferability of a study can be supported by giving thorough descriptions of the contexts and the people participating in the study (Connelly, 2016). Thus, in order to enhance the transferability of this study there is a description of the characteristics of the case organization as well as mature startups in the IoT-sector. The description of the case organization can be found in Appendix A and the characteristics of a mature startup in the IoT-sector can be found in

Definitions above. Furthermore, the defining characteristics of the interviewees are described in Appendix C.

Secondly, one method for ensuring transferability is to do a *purposive sampling*, as described in section 2.2.1.2 *Selection and Recruitment of Participants* (Connelly, 2016; Guba, 1981). In this study, the purposing sampling was performed by carefully selecting all the participants based on specific sub-sample criteria. The criteria for the first sub-sample, the startups, was first of all that they all met the criteria for being a *mature startup with in the IoT-sector* which were derived from the result of the pre-study. Further, one criteria for the startups was that they should all have differentiated services or products in order to diversify the sample. Similarly, the other two sub-samples were selected with an aim to reach diversity in experiences and roles, as explained in section 2.2.1.2.

2.5.3 Dependability

Dependability refers to the consistency of the research, i.e. if the study could be repeated (Guba, 1981; Shenton, 2004). According to Chowdhury (2015), the dependability of a qualitative study is synonymous with reliability, which is described as *if the work were repeated, in the same context, with the same methods and with the same participants, similar results would be obtained* (Shenton, 2004, p. 71). One method to enhance the dependability of a study is to provide an in-depth description of the methodological approach (Shenton, 2004). Hence, in this study the methodological approach is thoroughly described with the aim to describe each step of the research process. Furthermore, interview guides were used for the data collection which may strengthen the dependability of the study, and the interview guides were confirmed with the supervisor at the university. Moreover, a list of elements in an offering of corporate-startup program was used in all interviews as a reference. Using this list would enhance the probability of future researchers to obtain similar results.

Furthermore, a pre-study was used to define the target group of startups, which implies that the startups studied became a well-defined group of startups. With the selection criteria for startups, it could be ensured that they were in the same stage and industry, and would enable the study to be repeated, which increases the dependability.

2.5.4 Confirmability

Confirmability refers to the neutrality of a study, i.e. if the results are consistent and could be repeated (Connelly, 2016; Guba, 1981). It is described by Shenton (2004, p. 63) that *researchers must take steps to demonstrate that findings emerge from the data and not their own predispositions*. In order to strengthen the confirmability of the study both researchers participated during a majority of the interviews, and coded and analyzed the empirical data together. This enhances the confirmability of the study as multiple researchers enable a more objective view. Moreover, when identifying patterns in the data, a codebook was developed with through descriptions of the codes enabling the researchers to perform the analysis on a more objective foundation as the use of a codebook ensures that the data is coded in a consistent manner (Hennink et al., 2011). The codebook can be found in Appendix E.

Furthermore, the research is based on an abductive research approach, where the empirical data was contrasted with theory, enabling the researchers to confirm the differences and similarities between the empirical and the theoretical data.

3 Theoretical Framework

This chapter lays the foundation for theoretical perspective, based on current literature and research. Presented theory is related to innovation, challenges for established companies to radically innovate, startup and their challenges to grow and develop. Further, theory is presented regarding startup support institutions and corporate-startup programs and how startups and established companies can contribute value to each other through a corporate-startup program, including the opportunities and risks that this venture may imply. Lastly, elements and design parameters in an offering of a corporate-startup program are presented.

The purpose of the chapter is to give the reader a deeper understanding of current research and theories that are relevant to the study. As mentioned in section 1.3 *Issue of Study* above*,* there is a research gap in the field of collaborations between large companies and startups. Especially, scientific research regarding corporate-startup programs focusing on mature startups and GHTCs, as well as collaborations in the IoT-sector, is lacking. Also, due to the novelty of this topic, new ways of designing and conducting corporate-startup programs are constantly emerging. Hence, in the theoretical framework the presented research related to corporate-startup programs and the offering of these is not exhaustive. Further, the theory presented related to established companies and startups is predominantly general, i.e. not focusing on GHTCs and mature startups in the IoT-sector specifically.

The outline of the theoretical framework is illustrated in Figure 3.1 below. First, a brief overview of innovation is presented, in order to establish a clear understanding of the importance and characteristics of innovation. Second and third, research on established companies and startups and their respective challenges is presented. This aims to provide a deeper understanding of the two actors and how they struggle, so that it can be understood how they can complement and help each other. Fourth, startup support institutions are presented, and corporate-startup programs are explained. Fifth, the opportunities and risks of engaging in a corporate-startup programs, for both parties, are presented. Lastly, elements in the offering of a corporate-startup program, including resources, services and activities as well as design parameters are presented in order to provide a deeper understanding of an offering of a corporate-startup program.
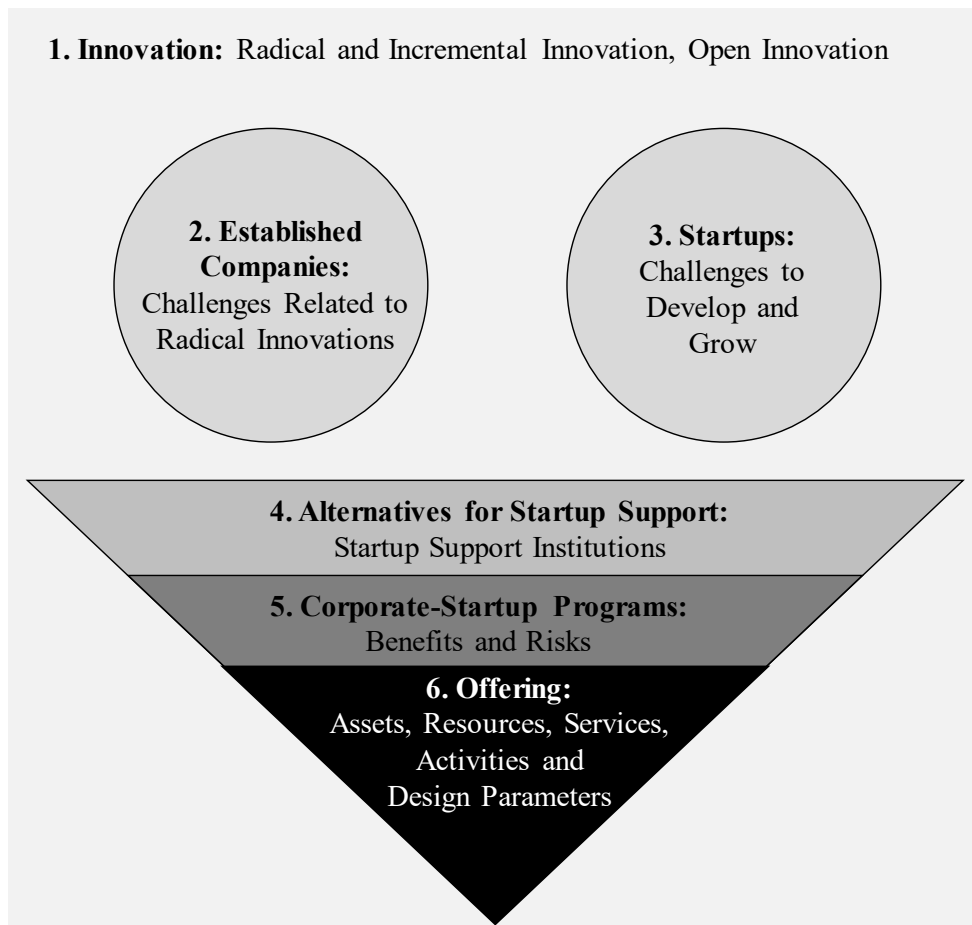
Figure 3.1. The outline of the theoretical framework

3.1 Innovation

Innovation, the concept of thinking of a novel or an improved way of doing something and then try to implement it in practice is not something new. As Fagerberg (2006) suggests that it is probably as old as mankind. Although it has not gained scholarly attention until just a few decades ago (Fagerberg, 2006).

In broad terms, Bessant and Tidd (2014, p.3) describe innovation as *the process of creating value from ideas.* More specifically, Crossan and Apaydin (2010, p.1155) define innovation as the *production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of*

products, services, and markets; development of new methods of production; and establishment of new management systems. It is both a process and an outcome. As opposed to invention which is merely the idea of a new process or product, innovation is the effort to carry out the idea in practice (Fagerberg, 2006). Thus, innovation entails the process of implementing the invention and bringing it to the market (Chesbrough, 2003a). In order for a company to achieve innovation and successfully commercialize an idea multiple skills, resources, knowledge, and capabilities have to be combined (Fagerberg, 2006).

The companies that innovate successfully create a unique competitive edge (Bessant & Tidd, 2014). Thus, innovation is a vital mean for companies enabling them to compete and to be successful in today's competitive corporate environment. According to management scholars, a firm's innovation capability is the most important determinant of firm performance (Mone et al., 1998). In order to achieve long-term success, it is suggested that it is even more important for a company to be innovative than to be efficient (Mocker et al., 2015). Further, it is suggested that innovation is necessary for both the survival and the growth of companies (Bessant & Tidd, 2014). If companies stagnate, and stop or fail to innovate and change, they will be threatened by competitive forces and ultimately die (Bessant & Tidd, 2014; Chesbrough, 2003a). The main driver for innovation, according to Bessant & Tidd (2014), is entrepreneurship. Entrepreneurship is characterized by a mixture of elements such as energy, passion, and risk-taking, commonly found in startups (Bessant & Tidd, 2014).

The innovation process is a highly complex process and involves different variables and interactions that are not fully understood. Therefore, it is difficult for companies to accurately predict the technical performance of the innovation and how it will be received by potential customers (Pavitt, 2006). Hence, engaging in innovative activities implies high levels of uncertainty and potentially taking on large amounts of risk. However, individuals working with innovation tend to be over optimistic regarding the benefits, the costs, time of innovation projects and activities as well as the market demand for these (Pavitt, 2006).

3.1.1 Different Types of Innovation

Evident from the definition of innovation presented above, innovation can be applied in different domains and imply changes in different dimensions. In current literature, multiple ways of classifying and describing innovation characteristics are found. One of the most common ways of classifying innovation is by the *magnitude dimension* of innovation (Crossan & Apaydin, 2010; Gopalakrishnan & Damanpour, 1997). This dimension refers to the innovation outcome and the degree

of change and newness associated with it (Gopalakrishnan & Damanpour, 1997). The degree of newness can be measured with regards to the firm, to the market or to the industry (Crossan & Apaydin, 2010). From the perspective of the magnitude dimension innovation can classified as being either *incremental* or *breakthrough* (also, by scholars referred to as radical, disruptive, revolutionary or discontinuous) (Crossan & Apaydin, 2010; Mohr et al., 2010). Hence, in this study, breakthrough, radical and disruptive innovations are used similarly.

Incremental innovations are extensions of existing technologies, methods, products or processes, usually implying minor improvements developed in response to specific market needs. Incremental innovations are rather evolutionary as opposed to revolutionary (Mohr et al., 2010). Breakthrough innovations on the other hand, imply fundamental changes and transforms firms or industries (Crossan & Apaydin, 2010; Gopalakrishnan & Damanpour, 1997). Breakthrough innovations are revolutionary rather than evolutionary and thus these create completely new markets (Mohr et al., 2010). Further, breakthrough innovation is more commonly associated with business model innovation while incremental innovation is more commonly associated with the innovation of products and processes (Crossan & Apaydin, 2010). Radical innovations, i.e. breakthrough innovations, are needed for growth and long-term success of companies (Day, 2007; Leifer, O'Connor, & Rice, 2001; PwC, 2013). Today, startups are increasingly driving radical innovations that possess the potential to disrupt whole industries (Chesbrough & Weiblen, 2015; Mocker et al., 2015).

Successful radical innovations generally create a discontinuity in the marketplace and transform the demand and supply in that industry. Hence, incumbent companies in that industry are met with a decline in demand for their existing products and a high level of competition that threatens their existence (Hill & Rothaermel, 2003). Specifically, when a radical new technology is introduced in an industry, it typically underperforms current technologies and therefore, incumbent companies tend to ignore or understate that new potential competitive threat. As more new entrants start to experiment on that technology, the performance capability of that new technology increases. Eventually, the new technology outperforms the incumbent technology and thereby, a new dominant design emerges, the incumbent technology becomes obsolete and there are new winners in the market (Mohr et al., 2010). This process is referred to as *creative destruction* (Mohr et al., 2010; Hill & Rothaermel, 2003).

3.1.2 Open Innovation

The concept *Open Innovation* was coined by Henry Chesbrough in 2003 and builds on the idea that companies need to integrate external ideas, skills and expertise in order to effectively deliver products and services to the market, and that the corporate R&D must be extended beyond the boundaries of the company. In contrast, closed innovation implies that a company generates, develops and commercializes its own ideas (Chesbrough, 2003b). Further, open innovation is a mean for companies to search for innovation (Bessant & Tidd, 2014). Chesbrough (2003a, p.xxiv) suggests that o*pen innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as firms look to advance their technology.* Thus, according to Chesbrough (2003a) the development of a firm's technologies does not solely come from internal innovation but also from using the discoveries and work of external parties and networks. Open innovation is about leveraging the knowledge and assets that you possess internally as well as benefiting from the knowledge and assets that others possess (Chesbrough, 2017). Open innovation is illustrated in Figure 3.2 below.
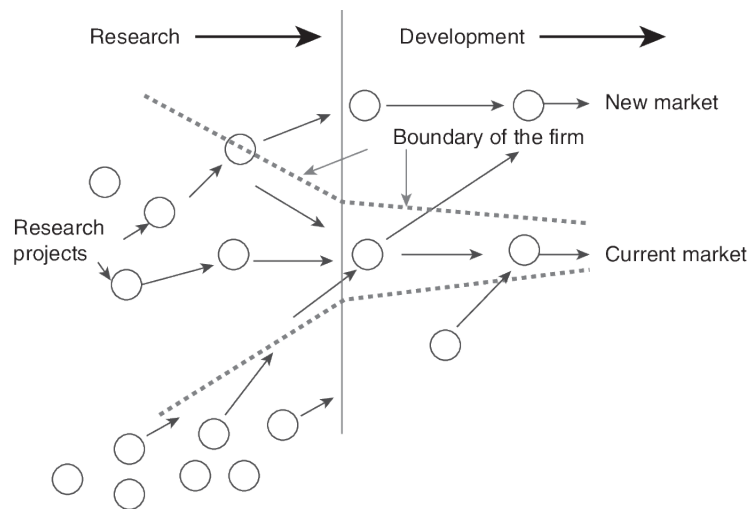
Figure 3.2. The open innovation model (Chesbrough, 2003a, p. xxv)

Open innovation builds upon a set of six principles, presented in Table 3.1 below.

Table 3.1. The principles of open innovation (Chesbrough, 2003a, p.xxvi)

Principles of open innovation	*Principles of closed innovation*
Not all smart people work for us. We need to work with smart people inside and outside the company	The smart people in our field work for us
External R&D can create significant value; internal R&D is needed to claim some portion of that value	To profit from R&D, we must discover it, develop it and, ship it ourselves
We don't have to originate the research to profit from it	If we discover it ourselves, we will get it to the market first
Building a better business model is better than getting to market first	The company that gets an innovation to the market first will win
If we make the best use of our internal and external ideas, we will win	If we create the most and the best ideas in the industry we will win
We should profit from others' use of our IP [intellectual property] and we should buy others' IP whenever it advances our own business model	We should control our IP, so that our competitors don't profit from our ideas

Chesbrough describes open innovation as a new paradigm, which is characterized by a knowledge landscape where knowledge is abundant. Thus, when knowledge abundance characterizes the current state, it is essential that companies access what they need, from both inside and outside the boundaries of the company; it is not enough to only rely on internal development of technologies (Chesbrough, 2003a).

This new paradigm has gained much awareness due to its relevance to corporate R&D, and the recognition and increasing awareness of the limitations with closed R&D (Enkel, Gassmann, & Chesbrough, 2009; Mocker et al., 2015). According to Enkel et al. (2009) research shows that the range of situations where open innovation is considered applicable is increasing. The benefits and advantages of openness has been shown to imply improved technical performance, faster execution of projects as well as higher revenues (Mocker et al., 2015).

Open innovation can be divided into three categories, based on the perspective of a company's processes: (1) outside-in -, (2) inside-out -, and (3) coupled process open innovation (Enkel et al., 2009). These are described in Table 3.2 below.

Table 3.2. The three categories of open innovation

Type of open innovation	*Description*
Outside-in *(Enkel et al., 2009, p.312)*	Enriching the company's own knowledge base through the integration of suppliers, customers, and external knowledge sourcing
Inside-out *(Enkel et al., 2009, p. 312)*	The inside-out process refers to earning profits by bringing ideas to market, selling IP, and multiplying technology by transferring ideas to the outside environment
Coupled process *(Enkel et al., 2009, p.313)*	Co-creation with (mainly) complementary partners through alliances, cooperation, and joint ventures during which give, and take are crucial for success. Companies that establish the coupled process as key combine the outside-in process (to gain external knowledge) with the inside-out process (to bring ideas to market) and, in doing so, jointly develop and commercialize innovation

Challenges for companies to engage in open innovation are related to the difficulty in finding appropriate partners; the difficulty in finding a balance between the activities linked to open innovation and the activities linked to the *daily business*; and the lack of financial resources and time (Enkel et al., 2009). Furthermore, Enkel et al. (2009) highlights the fact that if the company is too open, it can have a negative impact on the company's innovation success in the long run. This is due to the risk of companies losing control as well as their core competencies.

3.2 Challenges for Established Companies to Radically Innovate

According to the definition of a company, it is designed to *execute* a proven business model, and thus performing breakthrough innovations is a challenge for them since they interfere with the processes used for the proven business model (Blank, 2014; Chesbrough, 2014). In this section, the need for an established company to pursue both incremental and radical innovations is explained through organizational ambidexterity and the challenge for companies to radically innovate is emphasized. Lastly, the inability of established companies to radically innovate and create new knowledge is a result of several factors that are explained.

3.2.1 Organizational Ambidexterity

In order to be successful and develop, established companies need to pursue both incremental innovation and pursuing breakthrough innovation (Lau et al., 2017). This ability is referred to as *organizational ambidexterity*, which O'Reilly III and Tushman (2013) define as *the ability of an organization to both explore and exploit—to compete in mature technologies and markets where efficiency, control, and incremental improvement are prized and to also compete in new technologies and markets where flexibility, autonomy, and experimentation are needed.* Even though the importance of being ambidextrous, scholars suggest that established companies tend to focus primarily on incremental innovations and engage insufficiently in pursuing breakthrough innovations (Berchicci & Tucci, 2008).

The failure to embrace new technology is mentioned by scholars as a reason for declining performance among incumbent companies in the era of breakthrough technological innovations (Hill & Rothaermel, 2003). Still, incumbent established companies tend to focus on incremental innovations and struggle to recognize and respond adequately to threats posed by new technologies and new entrants (PwC, 2013; Day, 2007; Hill & Rothaermel, 2003). The established companies are generally excellent, better than startups, when it comes to developing incremental innovations with existing technology, and to make operations more efficient. Studies suggest that companies tend to spend up to 90 % of their innovation investments on incremental innovations, whilst it is the radical innovations that contribute to a majority of the profits and create competitive edge (Day, 2007; PwC, 2013). The inability of incumbent companies to radically innovate and create new knowledge is further explained below. However, companies understand the importance of radical innovations more and more, and their focus on pursuing these kinds of innovations is increasing and becoming wider (PwC, 2013).

3.2.2 Corporate Inertia and Cognitive Barriers

The inability of established companies to radically innovate and create new knowledge is a result of several factors related to organizational inertia and cognitive barriers (Thieme, 2017; Berchicci & Tucci, 2008). Large companies tend to suffer from organizational inertia which can slow down or hinder corporate innovation and contribute to inability for large companies to pursue radical innovations (Berchicci & Tucci, 2008; Mohr et al., 2010; Thieme, 2017). Further, cognitive barriers tend to inhibit the ability of incumbent companies to recognize new technologies and their potential, instead they tend to overestimate existing technologies (Berchicci & Tucci, 2008). Factors that create inertia and cognitive barriers, which may impact the large company's interaction with startups, are further described below.

3.2.2.1 Excessive Focus on Existing Technologies and Markets

One of the reasons why incumbent companies are resistant to radical innovations is because it interferes with the existing and proven business model of the company and makes their current capabilities obsolete (Bannerjee et al., 2016; Chesbrough, 2014). The competences within the organization are designed for the current business and therefore, managers tend to focus to maximize the utility of existing technologies and markets, which works like an organizational filter (Berchicci & Tucci, 2008).

Further, economic incentives imply that incumbent companies prefer to maximize revenue from existing technology, rather than investing in new technologies. As scholars suggest, incumbent companies benefit from their market power protected by entry barriers and hence, they tend to invest in innovations that contribute to their existing products and the preservation of entry barriers, i.e. incremental innovations (Hill & Rothaermel, 2003). Further, the fear to cannibalize on existing products or to create discontinuity in the market that damage their market power, prevent them from investments in radical innovations (Hill & Rothaermel, 2003; Berchicci & Tucci, 2008).

3.2.2.2 Organizational Rigidity

Complex organizational structures, formality and rigid communication channels contribute to inertia and inhibit a company to adapt and change for innovations (Berchicci & Tucci, 2008). This rigidity and inflexibility is a consequence of large organization's tendency to shape themselves based on stable environments. The reason for this is that an organization is valued for its predictability and reliability and therefore, they tend to develop systems and processes that contribute to these two factors. A consequence of that is formality and bureaucracy. Structured routines and focus around the core business are other factors that established companies tend to develop, which are only efficient in stable conditions. Thus, what beneficial in stable environments, contribute to inertia and prevent recognition of new threats in a changing environment (Hill & Rothaermel, 2003).

Moreover, the power and politics in companies are obstacle for change and contributing to corporate inertia. It is a consequence of the competition of scarce resources within an organization. When an organization change, the distribution of power and influence change, which may lead to political behavior between different groups of interest (Hill & Rothaermel, 2003).

3.2.2.3 Lack of Entrepreneurial and Innovative Culture

An entrepreneurial culture is one that accepts and encourages new creative ideas, risks, failure, and changes. However, established companies often lack in these areas and they tend to have a corporate culture of risk aversion, with a fear to fail

(Bannerjee et al., 2016; Thieme, 2017; Leifer et al., 2001). Therefore, the attitude toward radical innovations are negatively impacted since these innovations imply higher levels of uncertainty and risk, compared to incremental innovations (Bannerjee et al., 2016; Leifer et al., 2001; Day, 2007). According to Day (2007), it is the risk and the longer time horizon before an investment generates profit, that often prevent companies to invest in radical innovations.

3.2.2.4 Absorptive Capacity

Incumbent companies are often unable to respond to radical changes and discontinuities in the marketplace. One suggested reason for this inability is the phenomenon *absorptive capacity* (Hill & Rothaermel, 2003). Absorptive capacity is defined by Cohen and Levinthal (1990) as *the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends*. Cohen and Levinthal (1990) state that absorptive capacity is critical for the innovation capabilities of incumbent companies.

The level of absorptive capacity depends on the amount of previous knowledge and experience the company has related to a specific topic (Cohen & Levinthal, 1990). Hence, a company needs to have some knowledge about a new technology, in order to be able to recognize the value of it and use it to enhance their technological competences and capabilities (Davenport, Campbell-Hunt, & Solomon, 2003). According to Fagerberg (2006) possessing absorptive capacity is a prerequisite for all innovative firms. Since radical innovations by nature are based on new information, companies will have problems to recognize it due to their lack of prior knowledge in that area (Hill & Rothaermel, 2003). Further, Cohen and Levinthal (1990) suggest that it is important to invest in absorptive capacity early when a new field emerges, to not be locked out in the future. Otherwise, it will be difficult for the company to catch up and they may never recognize or utilize new information in that field.

3.3 Startup Characteristics

The characteristics of startups enables them to compete with established companies. Startups are able to disrupt, and challenge established corporations, due to their ability to grow rapidly, attract talent, and to specialize and target specific needs, especially in industries characterized by digitization (Kupp, Marval, & Borchers, 2017). Furthermore, startups possess the ability to be agile and to create radical innovations, which are capabilities that established companies lack, which make startups able to compete with large global companies (Chesbrough & Weiblen, 2015). As a consequence of the increased competitiveness of startups, the importance for established companies to collaborate, instead of competing, with

startups increases (Kupp et al., 2017). However, startups face many challenges. The factors that drive startups' challenges to survive and grow are described below, followed by the challenges that startups face in different stages of development. Lastly, specific challenges for startups within IoT are presented.

3.3.1 Factors Driving Startups' Challenges

As a startup grows, challenges arise and drastic changes in how the company is run are required (Davila et al., 2010; Kazanjian & Drazin, 1990). The challenges startups face are difficult to overcome, however if these are not overcome the startup will fail. The reasons for failing tend to be the inability to meet the challenges that appears as the business grow, lack of experience or competence, inappropriate management, resistance to transform into a more structured management approach, such as use of formal routines and procedures (Davila, Foster, & Jia, 2010; Picken, 2017). Furthermore, according to a recent study performed by the research firm CB Insights (2018) it was shown that the ten most common reasons to why startups fail are: no market need for their solution, lack of financial means, not the right team, get outcompeted, pricing and cost issues, user unfriendly product, no business model for the product, poor marketing, ignoring customers, and that the product is ill-timed.

Moreover, scholars suggest that legitimacy is a critical resource for startup survival (Ricard, 2017). Legitimacy is described as the *social judgment of acceptance, appropriateness, and desirability, enables organizations to access other resources needed to survive and grow* (Zimmerman & Zeitz, 2002, p. 414). The importance of legitimacy is supported by a study performed in Sweden in 2003, investigating 223 startups, concluding that the survival of new ventures is highly dependent on the actions taken to enhance the legitimacy of the new venture (Delmar & Shane, 2003).

Multiple research studies show that the legitimacy of a firm will affect the firm's ability to commit to stakeholders, communicate with stakeholders, access markets, and innovate. New ventures need legitimacy in order to overcome the *liability of newness* implying that new ventures assumed to lack trustworthiness, credibility and predictability, which in turn threatens the survival and growth of these firms. One reason for this is that new ventures lack a *track record* and thus new ventures are in need of resources from other institutions (Ricard, 2017).

One way of enhancing the legitimacy of a new venture is by endorsements from organizations with more legitimacy. An endorsement is *a favorable opinion given by one organization to another* (Zimmerman & Zeitz, 2002, p. 419) It is suggested

that the legitimacy of the endorsing organization will spill over to the new venture and thereby enhance the legitimacy of the new venture. Another way to enhance the legitimacy in a new venture, as suggested by scholars, is through building networks and building connections to external organizations, individuals, and associations. Networks is proposed to help new ventures to overcome the *liability of newness* as these can provide credibility, support, and access to resources. Especially, if a new venture is connected with established firms, it will enhance the legitimacy of the new venture as it can *piggyback* on the legitimacy of the established firms (Zimmerman & Zeitz, 2002).

Further, it is suggested that enhanced legitimacy stems from reliability and accountability relationships with external stakeholders, gaining control over resources and combining them in new ways (Delmar & Shane, 2003).

Furthermore, ScaleUp Institute (2017a) describes five barriers that scaleups[1] need to overcome in order to scale up their business that corporate-hosted startup programs can contribute to. These are described in Table 3.3 below. The access to talented people, with the right skills, is considered as being the most critical aspect when to scale a startup (ScaleUp Institute, 2017a).

Table 3.3 The five gaps and barriers that scaleups face and that corporations can contribute with (ScaleUp Institute, 2017a)

Gap	*Description*
Talent and skills gap	Barrier to finding employees to hire who have the skills that the startup needs
Market gap	Barrier to access customers in different markets
Leadership capacity gap	Barrier to build leadership capabilities
Finance gap	Barrier to access the desired financing combinations
Infrastructure gap	Barrier to access high-quality infrastructure

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[1] SMEs who report turnover growth of 20%+ in the previous year and in each of their preceding two years (ScaleUp Institute, 2017b p.7)

3.3.2 Growth Phases and Related Challenges

A startup's challenges and needs to grow can be described by relating them to the growth phase in which the startup currently is in. Hence, the resources and capabilities that are critical or the startups differ depending on the phase. Description of the sequential evolution, i.e. the growth, of a startup is extensive in current literature, and there is no common definition. According to Bergfeld (2015), the development of a startup is never linear and thereby, a *one-size-fits-all* supportive program is not preferable. Table 3.4 below presents growth phases and related challenges as depicted by four scholars. Specifically, the scholars describe the growth phases for a *small business* (Churchill & Lewis, 1983), for a *technology based new venture* (Kazanjian and Drazin, 1990), for a *nascent startup to become an organization that can sustain profitable growth* (Picken, 2017) and for *Internet startups* (Marmer, Hermann, & Berman, 2011). All of these are considered relevant for startups in our study.

Table 3.4. The growth phases of a startup and related challenges as described by four scholars

Source	*Growth phase*	*Description*	*Challenges*
Churchill and Lewis (1983)	Existence	Simple organization, the owner *is* the business, main strategic objective is to exist	Obtain customers; deliver contracted products; ability to finance the business
	Survival	A simple but working business with enough customers that can be retained, may have limited employees but still centered around the owner, main strategic objective is to survive	Handle the relationship between revenues and costs: In the short term, ability to break even and cover repairs; In the long term, ability to finance growth and gain a return
	Success	Business has gained true economic wealth and has average profits, either the business is focused on further growth or to stay in the current stage. In the latter case, the main strategic objective is to invest resources in growth whilst still being profitable from the basic business	Access financial resources; hire or develop competent managers; install business systems for future needs; strategic planning; balance profit and future growth
	Take-off	The business grows rapidly and need to finance that growth, the organization tend to become divisional	Delegate responsibility effectively; access financial resources; access competent people; strategic planning

	Resource Maturity	The small business now tends to have the size, financial resources and management of a company, the main strategic objective is to get return in investment	Strategic planning; professionalize the business whilst retaining the entrepreneurial qualities
Kazanjian and Drazin (1990)	Conception and Development	A product and/or technology is invented and developed, initial financial backing is typically gained	Development of the business idea; construction of prototype; selling the business idea to investors; getting initial funding
	Commercialization	The product and/or technology is developed for commercialization, the organizational functions may be divided to some extent	Begin to manufacture; starting with marketing and sales; solving technical difficulties; develop administrative systems; gain market acceptance
	Growth	The product is produced, sold and distributed in volume, whilst focus is to balance profits with investments for growth. The organization tend to become more hierarchical and divided.	Manufacture in volume, efficiently and with high quality; manage sales and distribution; establish market share; access to experienced and professional personnel
	Stability	A stable and working business that focuses to maintain growth and market position. The organization is structured, bureaucratic and formalized. It is managed by a management team, not the owner itself.	Develop another product, whilst managing the current business efficiently
Picken (2017)	Startup	A business concept is developed. Time and resources are limited, and the organization is informal and unstructured.	Define and validate business concept, i.e. the market opportunity, the offering, the business model and the go-to-market strategy
	Transition	The business gains traction in the market, the phase is a bridge between unstructured and informality to the structure and discipline required for scaling.	Complete the development of the offering; access additional resources for scaling; access experienced and competent people; establish credibility and legitimacy; strategic planning; create a supportive culture; manage risk; implement discipline

	Scaling	Rapid growth to establish a sustainable market position. The organization is more structured, disciplined and divided	Access to resources; leverage processes; use partnerships; attain consistent return on investment (ROI); access to functional specialists
	Exit	Enabled by an initial public offering, a merger, an acquisition or a private sale	N/A
Marmer et al. (2011)	Discovery	The problem to be solved is validated by interviewing customers, value proposition defined, minimum viable product (MVP) is created and founding team is formed. Friends and Family founding round	Acquire customers; limited time; few people have to handle many areas; achieve problem solution fit; achieve investor relations
	Validation	The product is validated, and the product is refined. The first customers are gained, and the first employees are hired	Acquire customers; achieve problem solution fit; achieve product market fit
	Efficiency	Business model and value proposition is refined, the efficiency of the customer acquisition process is improved	Acquire customers; streamlined customer acquisition process; repeatable sales process; access to competent people to the team; fundraising
	Scale	Rapid growth, the product is prepared for scaling. The first managers are hired, and departments are established.	Acquire customers; access to competent people to the team

3.3.3 Challenges for Startups in the IoT-Sector

Except for the challenges startups face presented above, there are specific challenges that startups within IoT face. A brief overview of challenges related to the development of IoT are described below.

First of all, due to the nature of IoT, an IoT solution typically includes a software and a hardware component (Hussain, 2017). Compared to software, hardware is more expensive and complex to produce. This is a challenge for startups in the IoT-sector since they usually do not have the financial muscles to produce the number of devices required, and it is time-consuming for the startups to build the hardware components themselves (Graham, 2013). Moreover, related to hardware there are challenges related to e.g. sensor deployment, and power and energy maintenance, connectivity and the hardware's ability to work in its operating environment (Hunter, 2015; Mae Melchior, 2018). Moreover, the real-time communication of information, one of the most important feature in an IoT solution, is challenging especially on a large scale (Hussain, 2017).

Security and privacy are two of the major challenges for startups (Hussain, 2017). The security challenge includes securing the data generated from users and eliminate the risk that the data is accessed by hackers, and the privacy challenge includes protecting the personal information of the users (Hunter, 2015; Hussain, 2017; Wagner, 2018).

Moreover, there are challenges related to the collection of the data, the processing, and storing the data. Moreover, there is a challenge related to analyzing the vast amount of data that is generated. In order to do this sophisticated sampling, quantizing, and extraction technologies are required. Other, challenges related to data analysis are data analytic and communication protocol standardization (Hussain, 2017).

Moreover, according to a study, performed by Boston Consulting Group, based on 400 interviews with startups in different high-technology industries, investigating partnerships between *deep-tech* startups and established companies, the partner that is chosen will depend on the need of the startup. Major needs the startups in this study emphasized are funding, market access, technical knowledge and expertise, business knowledge and expertise, access to facilities, and talent acquisition. These were ranked by importance, i.e. funding was seen as the most important and market access as the second most important need et cetera (de la Tour, Soussan & Harlé, 2017).

3.4 Alternatives for Startup Support

There are many different alternatives for startups to receive support from external parties. This section introduces alternative startup support institutions. First, startup support institutions are described. Second, different kinds of corporate support

initiatives are presented, and it is defined which of these that are within the scope of this study. Third, the definition of a corporate-startup program, as used in this study, is presented.

3.4.1 Startup Support Institutions and Initiatives

An overview of startup support institutions is described in this section. In Figure 3.3 below is an illustrated overview of the different institutions followed by a description of these institutions.
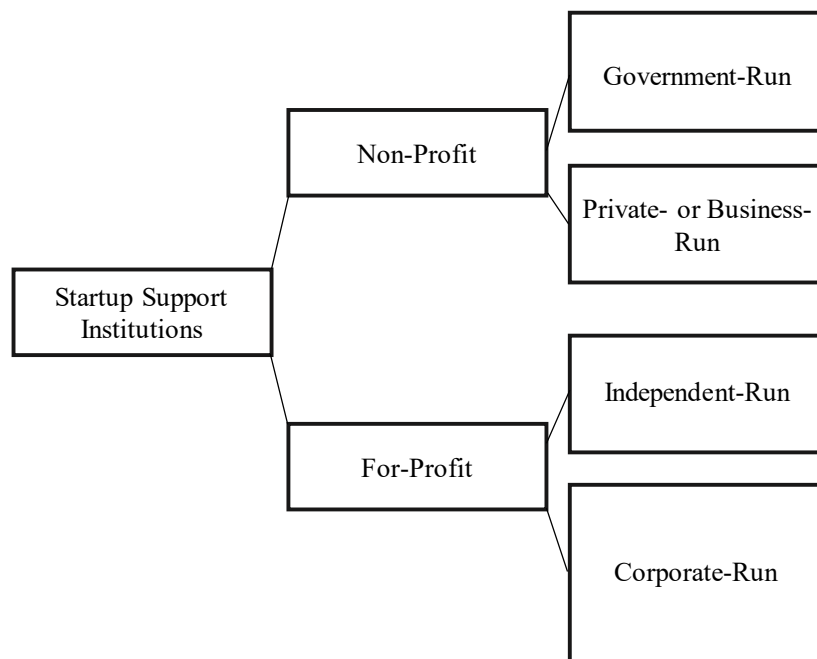
Figure 3.3. Illustration of different support institutions

The network of institutions that offer support to startups is extensive. The support these institutions can contribute is by providing resources and capabilities that startups typically lack. As Becker and Gassman (2006b) explains, the support institutions can be either non-profit, with a social purpose, or they can be for-profit, with a purpose to gain financial returns. The non-profit support institutions can be run by either the government, such as university- or community incubators aimed to contribute to society or funded by private or business initiatives. Furthermore, the for-profit support initiatives can either be run by independent actors such as venture capitalists, with an aim to gain fast profits from startups, or they can be corporate-run usually aiming to extract value from their technology portfolio and explore new technologies (Becker & Gassman, 2006b). Examples of non-corporate run support

initiatives are incubators and accelerators, and these can be either non-profit or for-profit. This study focuses on support initiatives hosted by established companies, i.e. corporate-run initiatives. These are further explained below.

3.4.2 Startup Support from Established Companies

Corporate-run startup support initiatives are referred to as *corporate-startup engagements*, which are described by Thieme (2017 p. 14) as *the corporate act of creating, interacting with, collaborating with, investing in or acquiring startups*. Evidently the concept is broad as well as the spectrum of corporate-startup engagement models available (Mocker et al., 2015; Thieme, 2017). Corporate-startup engagements is a way for established companies to engage in open innovation (Thieme, 2017).

The different types of corporate-startup engagements available are defined differently by scholars, and unified titles of the models, definitions, and description of what each model entail, are currently lacking (Thieme, 2017). Different corporate-startup engagements types are presented in Table 3.5 below. The different models are briefly described based on current literature, and it is defined what models that are within the scope for a corporate-startup program.

Table 3.5. Different types of corporate-startup engagements

Type	*Description*	*Source*	*In scope*
One-off Events* Events**	Companies host events, conferences and competitions, including corporate hackathons, that are intense and last for a relatively short period of time	*(Bannerjee et al., 2016; Mocker et al., 2015) **(Bonzom & Netessine, 2015)	No
Sharing Resources* Startup Programs** Support Services** Co-working space**	Companies share resources with startups for free, including office space, tools, technologies, mentors, support services such as legal, accounting, marketing, and access to customers, suppliers, distributors and a community	*(Bannerjee et al., 2016; Mocker et al., 2015) **(Bonzom & Netessine, 2015)	Yes
Corporate Incubators	A corporate for-profit initiative, run to enhance a corporation's technology development. Defined	(Becker & Gassmann, 2006a,	Yes

	as *specialized corporate units that hatch new businesses by providing physical resources and support. They support external startups or internal entrepreneurs with a promising business idea or technology*	p. 471)	
Corporate Accelerator	Corporate initiative that includes growing and managing portfolios of startups with an aim to accelerate innovation and gain competitive advantage. Defined as *company-supported programs of limited duration that support cohorts of startups during the new venture process via mentoring, education, and company-specific resources*. Typically, includes provision of seed capital and elements such as mentoring, technical assistance, networking and work space	(Dempwolf, Auer, & D'Ippolito, 2014) *(Kohler, 2016, p. 348)	Yes
Partnerships	Range of strategic corporate-startup business partnerships, including product co-development and procurement from startups	(Bannerjee et al., 2016; Mocker et al., 2015)	Yes
Technology Alliance	*Formal arrangement between two or more independent organizations in order to jointly conduct technological activities*	(Faems, 2018)	Yes
Corporate Venture Capital	*A minority equity investment by an established corporation in a privately-held entrepreneurial venture*	(Dushnitsky, 2012, p. 1)	No
Acquisitions	A company acquire a startup to e.g. quickly and impactfully attain complementary technology or capabilities that can solve specific business problems and enter new markets	(Mocker et al., 2015)	No

3.4.3 Corporate-Startup Programs

As shown in Table 3.5 above, the scope for this study regarding corporate-startup engagement models does not include fully acquiring the startup, i.e. the startup and the company are separable entities during the whole collaboration. Nor does the scope include pure corporate venture capital models or one-off events. This implies

that the engagement has a potential end-date, although it is longer than merely a few days. Further, the scope for this study is to investigate a program for collaboration between an established company and external startups, where the company can provide resources and services, and arrange activities for the participating startups. Thus, in this study a corporate-startup program is defined as:

Corporate-startup program: *a collaborative program offered by an established company to startups that fulfills three criteria:*

1. *The program is more extensive than an event*
2. *The offering from the established company includes more elements than solely financial capital*
3. *During the whole program, the two parties are separable entities*

3.5 Benefits and Risks for Companies and Startups in a Corporate-Startup Program

Startups and established companies are complementary in nature, which creates the potential for mutual benefits, and thus startups usually have advantages where established companies have disadvantages and vice versa (Berchicci & Tucci, 2008; Kohler, 2016). Hence, in a corporate-startup program, there is vast potential for both startups and established companies to benefit and create a win-win situation (Mocker et al., 2015).

In order for both parties to benefit from an engagement, create positive synergies, and contribute value to each other, the set-up of the engagement program is important (Mocker et al., 2015). Scholars suggest that in order to create a successful model of engagement the value proposition offered by the established company is specifically important and the company need to deliver real value to the participating startups (Bauer, Obwegeser, & Avdagic, 2016; Kanbach et al., 2016). This is especially important since there is a risk involved for both parties participating in the engagement. However, corporate-startup collaborations are hard to make mutually beneficial, and thus it is important to prepare the set-up well (Mocker et al., 2015). In order to create such collaborations, it is important to find ways that enable both parties to complement each other, and to design the offering thereafter.

The specific benefits from a corporate-startup program for corporates and startups are presented below, as well as risks.

3.5.1 Potential Benefits

Below are different potential benefits that may stem from a corporate-startup program described. These potential benefits are described from both the perspective of the startup and the established company hosting the program.

3.5.1.1 Startup's Benefit from Engaging with Established Companies

Given the challenges startups face depicted above, in section 3.3 *Startup Characteristics*, it is obvious that startups need to overcome many obstacles in the different phases of development. According to ScaleUp Institute (2017a) collaboration with established companies is suggested to be an area of high priority for scaleups, and one of the reasons for this is that it offers an opportunity to connect with large customer and integrate with the supply chain of the established company.

Further, technology-based startups with radical innovations, face greater hinders, and hence they have a larger need to collaborate with external actors in order to have the ability to grow (Soetanto & Jack, 2011). The assets, resources and capabilities of an established company can help startups to overcome the challenges and facilitate successful startup growth (Kohler, 2016). As Weiblen and Chesbrough (2015, p.66) explains, *corporations have resources, scale, power, and the routines needed to run a proven business model efficiently*, which the startups often lack. It is highlighted that a corporation can give considerable resources such as market knowledge and experience, economies of scale, access to key contacts and established networks (Mocker et al., 2016; Bannerjee et al., 2016). However, for a successful collaboration, the startup need to identify their most critical needs for growth, to make sure that the corporation can provide that (Isabelle, 2013).

Moreover, startups engaging with established companies can gain credibility and visibility, which can make it easier for startups receive funding, and attract talents and business partners in the future (Kohler, 2016). Furthermore, an established company can bring validation to a startup by procuring their product or technology, acting as a partner or accepting the startup into an engagement (Bannerjee et al., 2016; Miller & Bound, 2011; Mocker et al., 2015). Also, brand power is mentioned as a benefit of engaging with a corporate, which include use of the incumbent company's brand (Becker & Gassmann, 2006b; Mocker et al., 2015).

3.5.1.2 Established Company's Benefits from Engaging with Startups

The need for established companies to engage with startups is suggested to be more important now than ever, due to the rapid change of technology and business models enabled by digitization (Bannerjee et al., 2016). It is indicated in research that engagement with startups enables long-term growth and renewal for the incumbent company (Kohler, 2016). For a long time, companies have been collaborating with

startups informally, however, formalized programs can bring even greater benefits for both parties (Mocker et al., 2015).

Startups help established companies to radically innovate. This is because a startup is designed to *search* for a proven business model and the search for new innovations does not interfere with existing processes, as it often does for incumbent companies, which imply that breakthrough innovations are created more easily within a startup (Blank, 2014; Chesbrough, 2014). Startups and established companies are complementary in nature since companies can support startups with execution, whilst startups can support companies with the search for disruptive innovations (Kohler, 2016). In addition, startups do not suffer from inertia to the same extent as large companies do. This is due to several factors. Their organization is simple, they can focus on specific niches and grow within those, and they do not have established networks with stakeholders. Further, to be successful startups need to circumvent the industries' barriers of entry and be able to take market share from the incumbent companies and hence, doing something new and develop radical technological innovations are their best chance (Hill & Rothaermel, 2003).

Different forms of corporate-startup engagements are typically variously effective in order to achieve a certain objective (Mocker et al., 2015). Hence, the incumbent company needs to choose the form of engagement that best suits their strategic objectives (Chesbrough & Weiblen, 2015). Different strategic corporate objectives for engaging with startups are compiled and described below, in Table 3.6.

Table 3.6. Strategic corporate objectives for engaging with startups

Corporate objectives	Description	Sources
Positive impact of the brand	Create an image of an innovative, agile, flexible and curious organization which attracts talent (especially young talent), customers and business partners	(Bannerjee et al., 2016; Mocker et al., 2015; Kanbach & Stubner, 2016; Kohler, 2016)
Rejuvenated culture	contributes internally to increased entrepreneurial spirit and thinking, as well as innovative learning through interaction with employees and functions	(Bannerjee et al., 2016; Bonzom & Netessine, 2016; Kohler, 2016; Kanbach & Stubner, 2016; Mocker et al., 2015)
Impact way of working	Knowledge about entrepreneurial and agile way of working	(Chesbrough & Weiblen, 2015; Kanbach & Stubner, 2016; Mocker et al., 2015)

Solve business problems	Developing and testing new innovative solutions together with startups, is quicker and implies lower-risk for the core business, compared to internal development and it also allows evaluation of solutions that can disrupt their current business	(Bannerjee et al., 2016; Bonzom & Netessine, 2016; Kanbach & Stubner, 2016; Kohler, 2016; Mocker et al., 2015)
Access external innovations	Extend the business by accessing external innovations by accessing startup's products, technologies and business models	(Bannerjee et al., 2016; Bonzom & Netessine, 2016; Chesbrough & Weiblen, 2015; Kanbach & Stubner, 2016; Mocker et al., 2015)
Expansion into new markets	Expansion into new markets by the startup's technology, product, channels and/or capability, specifically enable expansion into emerging markets	(Bannerjee et al., 2016; Bonzom & Netessine, 2016; Chesbrough & Weiblen, 2015; Kohler, 2016; Mocker et al., 2015)
Creating an ecosystem around the company's platforms	Let the startups build their products using the incumbent company's technologies and develop complementary products	(Bonzom & Netessine, 2016; Chesbrough & Weiblen, 2015; Kohler, 2016)
Commercialize non-core innovations	Develop business ideas and technologies that are not related to core business	(Chesbrough & Weiblen, 2015; Kohler, 2016)
Financial returns	Collaboration with startups lead to e.g. increased revenue, increased shareholder value or increased value of shares in the startup	(Bannerjee et al., 2016; Chesbrough & Weiblen, 2015; Kanbach & Stubner, 2016)
Gain strategic insights	Gain an understanding of current trends, market developments and technologies	(Bonzom & Netessine, 2016; Chesbrough & Weiblen, 2015; Kanbach & Stubner, 2016; Mocker et al., 2015)

3.5.2 Potential Risks and Challenges

Evident from above, there is potential, for both startups and established companies to harness great benefits from a formalized corporate-startup program, as the two

parties have potential to complement the other. However, to create a collaboration that is beneficial for both parties is hard since it involves challenges and a large amount of risk for both parties. The specific challenges and risks involved for the respective parties are discussed below.

3.5.2.1 Risks and Challenges for Startups to Engage with Established Companies

One challenge for startups to approach established companies is due to their differences in nature. The culture in a startup is usually significantly different from the culture in an established company which can cause misunderstandings. Further, startups and established companies usually have different pace, different *organizational clock speed* (Weiblen & Chesbrough, 2015). Startups do not suffer from inertia and tend to work faster and with more agility, in contrast to larger companies that usually work at a slower pace, with more rigidity and have long decision-making processes (Hill & Rothaermel, 2003). Furthermore, these contrasts can imply difficulties such as long and complicated procedures and a risk to slow the startup down (Bannerjee et al., 2016). Moreover, the startup risk to be slowed down due to misalignment of processes and timing of the two parties (de la Tour et al., 2017).

3.5.2.2 Risks for Established Companies to Engage with Startups

There are risks for companies to engage with startups and the outcome is often uncertain, especially when establishing and initiating a new corporate-startup engagement. According to Bonzom et al. (2016), different modes of engagement imply different levels of risk for the established company. Hence, the choice for an established company to engage with startups and the mode of engagement will be dependent on the level of risk aversion in the specific companies (Bonzom et al., 2016). Below, risks for established companies to engage with startups are presented related to ROI, different types of innovation, the risk profile, and the brand.

One risk for established companies is related to the difficulties of measuring and quantifying the ROI of a corporate-startup engagement. The initiative is a significant investment and upfront cost and because of the difficulties to measure ROI, the investment may be hard to motivate (Bannerjee et al., 2016; Mocker et al., 2015). Furthermore, since it is hard to measure and quantify ROI, there is a risk that a company invest money and resources into a collaboration with startups without being able to actually see the results and potential benefits this investment has brought to the company. This is suggested to be one of the reasons for established companies to not engage with startups at all (Bannerjee et al., 2016).

Further, a challenge for established companies to engage with startups is that the radical innovations startups bring are normally not coherent with the innovation

established companies seek (Bannerjee et al., 2016). It is suggested that up to 90 % of firms' innovation activities are related to incremental innovation (Day, 2007).

Furthermore, a consequence of collaborating with startups is that the risk profile of the established company will change. When the source of innovation is internal R&D, the risks are more related to technology. However, when a company opens up to external sources of innovation the risks associated with partnerships increase (Bannerjee et al., 2016). Hence, it is important to carefully select which startups to collaborate with (Bonzom et al., 2016). Further, startups have a high failure rate which may reduce the established company's ability to ensure business continuity (Bannerjee et al., 2016).

Moreover, there is a risk for established companies to damage their brand and reputation. If a startup is unhappy with the collaboration, due to e.g. inability of the established company to supply everything according to *the deal* and this becomes publicly known, it might be damaging the brand and reputation of the company (Bannerjee et al., 2016).

3.6 Elements in an Offering of a Corporate-Startup Program

In this section, possible elements in the offering of a corporate-startup program, based on literature regarding various startup support initiatives, is presented. Firstly, resources, services and activities are presented, followed by design parameters that may impact the offering according to current literature.

3.6.1 Resources, Services, and Activities

In general, to access resources, services and capabilities of an established company, that complement the startups' business, are suggested to enable startup growth (Kohler, 2016). Further, according to de la Tour et al. (2017) it is suggested that easy access to the resources in the established company should be offered to startups.

In Table 3.7 below, elements that are suggested to be provided in a range of startup support institutions focusing primarily on incubators and accelerators, both corporate-run and non-corporate-run. The choice of using literature regarding these types of startup support institutions is because there is no clear distinction of

elements in an offering from an established company and from an independent actor, and startups may likely consider all types of support institutions in order to fulfill their needs, and thus see these as equivalent. The elements mentioned in Table 3.7 were used to create the foundation of the data collection as described in section 2.4.2 *Literature Review*.

Table 3.7 Elements suggested to be offered to startups by startup support institutions

Element	Description	Sources	Relevant for
Customized product development	Product advice; deepened process knowledge; support to develop product; consulting to develop business	Baird et al., 2013; Bauer et al., 2016; Bonzom & Netessine, 2016; Kohler, 2016; Miller & Bound, 2011	Accelerators, Corporate Accelerators, Support Services
Customized business development	Know-how in order to develop the startup's business; support to define business model; develop business- and marketing plan; develop the business skills of the team; support to develop the management team; deepened business knowledge; domain expertise; business support described as *resources to accelerate the learning curve* (Bruneel, Ratinho, Clarysse, & Groen, 2012, p. 112) and *coaching/training activities undertaken to develop the incubatee* (Bergek and Norrman, 2008, p. 23)	Baird et al., 2013; Bergek & Norrman, 2008; Bonzom & Netessine, 2016; Bruneel et al., 2012; Fernández Fernández, Blanco Jiménez, & Cuadrado Roura, 2015; Grimaldi & Grandi, 2005; Kohler, 2016; Kupp et al., 2017; Lehman, 2013; Miller & Bound, 2011; Pauwels et al., 2016	Accelerators, Business incubators, Corporate Accelerators, Incubators, Support Services
Customized development of support functions	By having support services central, the overhead costs can be reduced. It includes general administrative support; technology assistance; marketing support; intellectual property (IP) lawyers; legal support; accounting	Baird et al., 2013; Becker & Gassmann, 2006b; Bergek & Norrman, 2008; Bonzom & Netessine, 2016; Clarysse & Yusubova, 2014; Isabelle, 2013; Lehman, 2015, Mocker et al., 2015; Soetanto & Jack, 2011	Accelerators, Business Accelerators, Business Incubators, Corporate Incubators, Incubators, Support Services
Access to technologies	Access to a company's technologies and products	Bauer et al., 2016; Fernández Fernández et al., 2015; Mocker et al., 2015	Business Incubators, Corporate Accelerators, Sharing Resources,

Office space	Access to a company's facilities; access to physical space and office space; co-working space; office design adapted to the needs of the startup	Baird, Bowles, & Lall, 2013; Becker & Gassmann, 2006b; Bergek & Norrman, 2008; Bonzom & Netessine, 2016; Bruneel et al., 2012; Chesbrough & Weiblen, 2015; Clarysse & Yusubova, 2014; Fernández Fernández et al., 2015; Kohler, 2016; Kupp et al., 2017; Mocker et al., 2015	Accelerators, Business Accelerators, Business Incubators, Co-working Space, Corporate Accelerators, Corporate Incubators, Incubators, Sharing Resources
Market access	Access markets either through gaining the incumbent company as a customer or accessing their distribution channels	Kohler, 2016; Mocker et al., 2015	Corporate Accelerators, Corporate-Startup Engagements
Financial support	Funding and financial support e.g. when starting the program; Cash to the startup; Seed capital; help to raise funding from investor	Baird et al., 2013; Bauer et al., 2016; Becker & Gassmann, 2006b; Chesbrough & Weiblen, 2015; Clarysse & Yusubova, 2014; Fernández Fernández et al., 2015; Miller & Bound, 2011; Mocker et al., 2015; Kohler 2016; Kupp et al., 2017; Pauwels et al., 2016	Accelerators, Business Accelerator, Business Incubators, Corporate Accelerators, Corporate Incubators, Corporate-Startup Engagements
Mentoring and coaching	Mentoring support; coaching; access to expertise; support and advice for the business so that it can develop; feedback on product and business. Mentoring include external mentors that can provide the startups with networks and insights based on their experience and internal mentors that can contribute with company-specific knowledge.	Baird et al., 2013; Bauer et al., 2016; Bergek & Norrman, 2008; Bonzom & Netessine, 2016; Clarysse & Yusubova, 2014; Kohler, 2016; Miller & Bound, 2011; Mocker et al., 2015; Pauwels et al., 2016	Accelerators, Business Accelerators, Corporate Accelerators, Corporate-Startup Engagements, Incubators, Support Services
Networking	Tap into the ecosystem of the incumbent company; access to internal networks; access to external networks including actors such as customers, business partners,	Baird et al., 2013; Bauer et al., 2016; Becker & Gassmann, 2006b; Bonzom & Netessine, 2016; Bruneel et al.,	Accelerators, Business Accelerators, Business Incubator,

	domain experts, suppliers, distributors, experienced entrepreneurs, alumni networks, potential investors, community. Secure a large and committed external network; experience and domain knowledge about the various aspects of setting up and growing a business	2012; Chesbrough & Weiblen, 2015; Clarysse & Yusubova, 2014; Fernández Fernández et al., 2015; Isabelle, 2013; Kohler, 2016; Kupp et al., 2017; Mocker et al., 2015; Soetanto & Jack, 2011	Corporate Accelerators, Corporate Incubators, Corporate-Startup Engagements, Incubators, Support Services
Non-customized program specific activities and training	Activities that are offered but not specifically customized to each startup such as educational training, workshops, events, demo days/investor days which is a public event where the startups are able to pitch their idea to investors and customers	Clarysse & Yusubova, 2014; Kohler, 2016; Mocker et al., 2015; Pauwels et al., 2016	Accelerators, Business Accelerators, Corporate Accelerators, Corporate-Startup Engagements
Frequent evaluations	Frequent evaluations of the startup's development; continuous monitoring of the progress	Baird et al., 2013; Clarysse & Yusubova, 2014; Pauwels et al., 2016	Accelerators, Business Accelerators
Portfolio of other participants	Value created through collaboration and networking with other participating startups. The characteristics of the portfolio of participants depend on the number of participating startups, their industry focus and if they are co-located	Becker & Gassmann, 2006b; Clarysse & Yusubova, 2014; Miller & Bound, 2011; Pauwels et al., 2016	Accelerators, Business Accelerators, Corporate Incubators
Post-program services	Post-program services include e.g. public relation (PR) opportunities, connections with investors, board participation, HR/recruitment support, regional meet-ups, alumni networking.	Baird et al., 2013	Accelerators

3.6.2 Design Parameters

When designing and setting up a corporate-startup program, there are certain considerations to take into account, which directly impact the participating startup and is part of the offering. The design parameters are discussed by different authors in the field of corporate-startup engagements, with regards to different engagement

types. Considerations presented in literature focusing engagement types that fall into the scope of this study, are six factors which are further described below.

3.6.2.1 Time Horizon

One parameter to take into consideration when designing different types of corporate-startup programs is the time horizon of the engagement (Bonzom et al., 2016; Kohler, 2016; Mocker et al., 2015). The time horizon implies how long the engagement should last. A longer time horizon gives more time to build relationships and a foundation for a real sustainable business. Further, the time horizon will depend on the characteristics of the startup, e.g. startups with a hardware solution or healthcare solution might require longer times of involvement than other types of startups, according to literature on corporate accelerators (Kohler, 2016). Furthermore, it is important that the time frame is clear, according to literature on partnerships and co-development, and the time frame refers to the time when a decision should be made whether to keep a partnership running or not (Mocker et al., 2015).

3.6.2.2 Degree of Customization

It is further important to consider the degree of customization. The degree of structure in a program might affect the degree of involvement from the incumbent company and the level of bureaucracy associated with the engagement. Furthermore, it is suggested in literature on corporate accelerators that the structure should be customized and adjusted to the needs of startups participating in the program (Kohler, 2016). Further, literature on corporate incubators emphasizes to adapt to the startup's current life cycle's needs during the program (Becker & Gassmann, 2006b).

Moreover, it is suggested by research regarding partnership between an established company and high-technology startups, that the structure of the collaboration should not be too formal in the beginning enabling limited commitment for both parties from the beginning. This gives the startup the possibility to prove that they are a potential business partner to the established company (de la Tour et al., 2017).

3.6.2.3 Coordination of Objectives and Expectations

Previous research regarding corporate accelerators and strategic partnerships indicates that objectives and expectations should be clear and set from the beginning, both from the established company and the startup (Bannerjee et al., 2016; de la Tour et al., 2017; Kohler, 2016). This will enable transparent and aligned goals (Kupp et al., 2017). If the company is aware of the startups' needs and goals from the start of the engagement, it can help them to settle priorities for the program, according to literature on corporate accelerators (Kohler, 2016). Also, when the engagement is similar to a partnership it is important that the company is upfront and clear on the timings and the process from the beginning (Bannerjee et al., 2016).

Further, research regarding partnerships between established companies and startups working with deep technology, suggests that if the two parties share a common objective, a win-win partnership can be established and that the objectives of the two parties should be settled from the beginning, and make sure that the contracts are aligned with these objectives (de la Tour et al., 2017).

From the perspective of the established company, it is suggested that they should have carefully considered their objectives with the corporate-startup program, fully understood what their needs are and why they are engaging with the startups (Bannerjee et al., 2016; Kupp et al., 2017; Mocker et al., 2015). If the strategic objectives are in place, the company can select the appropriate engagement mode (Chesbrough & Weiblen, 2015; Mocker et al., 2015). Further, the objectives need to be long-term when working with startups and a time span up to ten years is suggested. The high failure rate of startups is also important to consider when setting objectives (Kupp et al., 2017).

3.6.2.4 Allocate an Internal Champion

Literature suggests that it is important for the company to allocate an *internal champion* from the company to the startups (Bannerjee et al., 2016; Kohler, 2016; Mocker et al., 2015). The role of an internal champion, in a corporate accelerator program, is to act as a bridge between the company and the startup. This includes helping the startup navigate through the organization and its structure and give the startups access to the people within the organization that it needs. Further, the internal champion should assure that the value brought by the startups are used internally (Kohler, 2016). Further, it is suggested that the internal champion should have decision making and budget power and the aim is to save time for the startup and the established company (Bannerjee et al., 2016; Mocker et al., 2015).

It is also suggested that startups should have one point of contact and that should be someone who knows the organization well, and be able to make introductions (Mocker et al., 2015). Further, it is mentioned that managers for corporate accelerators should not be required to extensively report the activities and progress in the accelerator, since this will enable the managers to act based on their own judgement and the startup's needs. Further, the managers should see themselves as advocates for the startup and treat them like partners (Kupp et al., 2017; Mocker et al., 2015).

3.6.2.5 Degree of Simplicity of Initiating the Engagement

One factor that is important for corporations to consider when designing the offering is the degree of bureaucracy involved for the startup to start the collaboration. In order to design an attractive offering, it is indicated that the company should keep the degree of bureaucracy low and thus make it as simple as possible for startups to

engage with them (Bannerjee et al., 2016; Mocker et al., 2015). For a partnership, this includes making contracts simple and standardized whenever possible, and settle issues regarding IP ownership and exclusivity in the beginning (Bannerjee et al., 2016; de la Tour et al., 2017).

3.6.2.6 Align the Way of Working

It is recommended by Bonzom et al. (2016) that companies engaging with startups should ensure that they work at the same pace as the startups are working. As mentioned previously, companies are more bureaucratic and slower than in startups as these work with more agility, and thereby, if startups need to take time and wait for the company, there is a risk that the engagement will backfire (Bonzom et al. 2016).

3.7 Summary of the Theoretical Framework

All sections of the theoretic framework are briefly summarized below in consecutive order.

3.1 Innovation: Innovation and the process of creating value from ideas is important in order for companies to be competitive, survive and grow. Innovation can be open or closed. Open innovation builds on the idea that companies need to integrate external ideas, skills and expertise and that corporate R&D must be extended beyond the boundaries of the company. Further, innovation can be classified to be incremental or radical depending on the degree of newness. Incremental innovations are evolutionary, whilst radical innovations are revolutionary. Radical innovations are needed for long-term success of companies and can disrupt whole industries, and these innovations are increasingly driven by startups.

3.2 Challenges of Established Company to Radically Innovate: Established companies need to pursue both incremental and radical innovations in order to be, the ability to do so is called *organizational ambidexterity.* However, established companies tend to focus primarily on incremental innovations and engage insufficiently in pursuing radical innovations. The challenges for companies to radically innovate and recognize the potential of new technologies, can be related to corporate inertia and cognitive barriers. Further, several factors contributing to inertia and cognitive barriers are: incentives to focus on existing technologies and markets, organizational rigidity that is only favorable in stable environments, a culture characterized by risk aversion, and absorptive capacity, i.e. *the ability of a*

firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends.

3.3 Startup Characteristics: Startups face many challenges that need to be overcome in order to be sustainable and grow, which is a difficult task. Common reasons why startups fail is related to e.g. the team, the business, lack of market access, lack of resources, and lack of legitimacy and credibility. Further, different challenges can be related to different growth phases for startups. It is evident that the challenges change as the startup grows. Moreover, startups in the IoT-sector face specific challenges, mainly related to the technological complexity and development of hardware.

3.4 Alternatives for Startup Support: There is a broad range of startups support institutions, including for- and non-profit as well as corporate-, independent-, private- and government-run. When it comes to corporate-run initiatives to support startups there is an extensive range of corporate-startup engagement types, ranging from one-off events to acquisitions. Common definitions for these engagement types are lacking. Engagement types included in this study are e.g. corporate incubators, corporate accelerators, partnerships and technology alliances.

3.5 Opportunities and Risks for Established Companies and Startups in a Corporate-Startup Program: There is vast potential for both startups and established companies to benefit from collaborating through a corporate-startup program. For startups, potential benefits are related to e.g. accessing resources, markets, networks as well as building legitimacy and credibility. Companies have essential resources, scale, power, and routines that startups usually lack. For established companies, benefits are related to e.g. corporate renewal, access to radical innovations, and improved ways of working. Companies can have different objectives with hosting a corporate-startup program which affects the type of engagement in such a program. However, it is a difficult task to establish a corporate-startup program and it implies risks for both parties. For startups, the main risk is to be slowed down by the company's rigidity, and time-consuming decision-making processes. For established companies, risks relate to e.g. difficulties to measure and quantify ROI and damage of the brand.

3.6 Elements in an Offering of Corporate-Startup Program: The number of elements that can be offered in a corporate-startup program is extensive. According to the definition of an offering in this study, it includes resources, services and activities, and design parameters that directly impact the participating startups. Examples of elements in an offering suggested in current literature are market access, financial support, mentoring and coaching, degree of customization, coordination of objectives and expectations, allocation of an internal champion,

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degree of simplicity of initiating the engagement and alignment of the way of working, were described.

4 Empirical Findings

This chapter presents the empirical findings, based on the collected data from the in-depth semi-structured interviews. The empirical findings are categorized based on three perspectives: the perspective of the startups, the perspective of the case organization, and lastly the perspective of the subject matter experts.

In this study, 15 semi-structured in-depth interviews were held in order to collect the data needed to investigate the research question from multiple perspectives, and thereby attain a holistic and nuanced understanding of topics related to the research question. The interviewees are six representatives from mature startups in the IoT-sector, four representatives from the case organization, and five external subject matter experts. The interview guides used when conducting these interviews can be found in Appendix B. The startups interviewed in this study were selected based on certain characteristics defined in a pre-study as well as the characteristics of their solution. The pre-study was a quantitative survey that was created by the researchers and distributed to employees within the case organization, as described in section 2.4.1 *Pre-Study,* above. The subject matter experts and case organization representatives were selected based on previous relevant experience and professional roles.

The empirical findings from the interviews are presented in summary below. First, the startup perspective is presented followed by the perspective of the case organization, and thirdly the perspective of the subject matter experts is presented. Lastly, a presentation of how each interviewee ranked the five most important elements are presented in Table 4.4. A thorough presentation of the answers from the interviewees are compiled and presented in Appendix D.

4.1 The Startup Perspective

A summary of the empirical findings from the startup perspective is presented below. A thorough presentation of the answers, with references to the interviewees, can be found in Appendix D.

Strengths of the mature startups in the IoT-sector

The main strengths mentioned by the startups in the interviews are related to a strong team with relevant experience and competencies; being small, fast and agile; strong technical competence related to core product; uniqueness of product or service; network of stakeholders; experienced advisory board and investors; and understanding of customers.

Weaknesses and challenges for mature startups in the IoT-sector

The main weaknesses and challenges mentioned by the startups in the interviews are related to lack of financial capital; difficulties to access investors; the long production cycles, and high cost and complexity of developing hardware; difficulties to reach customers with new innovative products; difficulties to reach and enter a market due to regulatory constraints; difficulties to reach the market with a hardware product; difficulties with being the first player on the market and lack of knowledge about target customers; high cost of marketing and PR to reach customers; and difficulties to find skilled people with passion for the product, business and sales skills, and IoT expertise.

Needs for mature startups in the IoT-sector to develop and grow

The major needs mentioned by the startups in the interviews are related to finding people in order to increase the technical expertise in the company; to increase market knowledge; to increase the startups' chances of getting funding; references to gain customers, talent, and partners; deep analysis of the product; finding financial capital; and settle partnerships.

Prerequisites and preferences related to participating in a corporate-startup program hosted by a GHTC

All of the interviewees acknowledged that engage with a GHTC would enable them to, at least partly, fulfill their needs and overcome their challenges to develop and grow. However, a majority of the startups said that this is not the case in all scenarios, and four prerequisites were mentioned as necessary, in order for the engagement to be beneficial to them. These are that the engagement enables a win-win business relationship; the program does not slow down the startup; the GHTC should be prominent in field in which the startup is active; and that there is real purpose for both parties with the program. One interviewee mentioned that a real purpose will ensure that the GHTC *does not hide the startups in their dungeon and show them off to everybody, like how innovative they are, like a canary or something*. Further, it is emphasized that the engagement form depends on the characteristics of the GHTC.

Furthermore, it was emphasized in the interviews that full commitment from the GHTC is desired including close ties between the two parties. Further, the importance of clear expectations from the GHTC was highlighted, as well as minimal steering and interfering with the startup's way of working. Lastly, multiple startups emphasized a win-win partnership as the preferable type of engagement.

The offering and the elements in a corporate-startup program

Mentioned elements that are suggested to be valuable in order to attract the interviewed startups and enable them to grow and develop are related to access an ecosystem and networks; having the GHTC as customer to gain credibility, validation and verification; access skilled IoT resources and support to accelerate development; access expertise from employees in the GHTC; access financial capital; support to validate ideas; access and exchanging knowledge related to e.g. customers, hardware production, setting up logistics and production, and technological issues; access to the customer segment of a GHTC; access to a well-known brand, and brand their products with the brand of the GHTC; access to distributions channels; collaborate in projects; help with certifications; access to a go-to-person with who the startup can get a deep relationship and access specialized mentors and experts through; integrate technical solutions; implementation of technology; and marketing support.

Moreover, there were some elements that were emphasized by a couple of the startups to be valuable only in a long-term engagement due to the consequences and commitment these may imply. These elements are access to customers; market access; and access to distributions channels. One quote underlining this: *I think for us the first step is to not just look at the nice and juicy customers but to first focus on them [the GHTC] to try to work together with them and see more of the long-term thing to get access to their customers. Because that is our goal with the collaboration partners, to sort of in the long term see them as a channel partner and we can use them to reach out to their customers. But I think it's good to not have that discussion too early.*

Comments on the list of resources, services and activities

In Table 4.1 below is based on a list presented during the interviews (found in Appendix B), that the startups commented on and subsequently prioritized the five most important elements in an offering of a corporate-startup program. A compilation of the prioritized elements is found in section 4.4 *Prioritization of Elements.*

Table 4.1 Comments from the interviewed startups based on a list of suggested elements

Element in list	Comments from startups
Customized product development	Four of the startups commented on this element. The preferences differed, and three of them were positive to some aspects of product development. Comments by interviewees were: ● Only software development is of interest currently; ● All areas of customized product development are of interest. However, the interviewee believes that it would be best to have someone from the GHTC to join their team working together with them, and use some of the GHTC's resources, rather than outsourcing work to someone from the GHTC; ● Hardware is the area where it would be most valuable to get assistance. However, the interviewee emphasized that it would be valuable to get assistance in all areas except the areas relating to their core business, which is also the area where they have their core competence. Further, the interviewee emphasizes that it is usually a question of price and performance; if the GHTC can help them at a lower cost than they already have for their services (especially the ones that are already outsourced), it would be of high value for the startup; ● None of these kinds of resources and services are interesting as they already have everything they need in this area.
Customized business development	This element was commented by five startups, with quite different views on getting business development offered by a GHTC; three of the interviewees were against this and two were positive to this element. Comments by interviewees were: ● Their startup is self-sufficient when it comes to business development, they have not yet encountered any problems with it and if they would in the future they have an advisory board whom they can turn to for advice; ● It would be difficult for a GHTC to help a startup with parts of business development, due to the differences in prerequisites and mentality in a startup and a GHTC; ● At the stage where their startups currently is at it is too late to offer business development, as companies in this stage already have a business plan, a management team and management skills. As he describes it *they* [the GHTC] *can provide someone that could be sitting on the advisory board for a while, maybe that could be interesting, but otherwise it's a bit too late to give business advice*; ● Their startup would need some help in this area, especially emphasizing in terms of marketing plan and business plan. However, this is not something the startup would be willing to outsource to a third party, but rather getting help from an advisor; ● They are looking for people with a lot of experience to have on their board and startups need to surround themselves with the smartest people possible in order to survive, which is something the interviewee believes that the GHTC can help with.

Customized development of support functions	Five of the interviewees commented on this element. Four of them indicated that it could be of interest and one indicated that it is not interesting. Comments by interviewees were:

- Words used when talking about this element were for example *there might surely be something for accounting or legal or whatever*, or as another interviewee put it *these are all okay, accounting, administration stuff, something there…*, or as another startup mentioned *we have specific questions but it's not like it's not like we need a huge effort in this area*;
- They need help with CE certification;
- It could be interesting to get help with marketing, in order to help the startup to get their solution to the market in a way that both parties can benefit from;
- Technology assistance is a potential area of interest and having contact with tech experts.

Technology transfer	Five of the interviewees touched upon this element, and all of these were in some way positive about this element as a potential offering from a GHTC. These were related to using and integrating the GHTC's existing platforms. Comments by the interviewees were:

- Especially IoT platforms and products of the GHTC would be interesting;
- It would be interesting to have a resource map of the GHTC's technologies, so that the startup can evaluate if there is a good fit with what the startup does and it so, they can use that technology in their product;
- Regarding co-development and sharing the startup's own technologies, one startup said *(...) if we have some special IP, we don't want to give it away but we can always license it (...)* and another startup were hesitant and responded *we are in a David and Goliath position there, and I think that, from talking to other companies that I've been working with, larger companies they are not always very nice about the NDAs* [non-disclosure agreements] *that are signed and so on. So, we are a bit careful about that. I would say it always depends on the situation, if we if you write strong NDAs and then if it's a nice group of people that we're working with, maybe, if they're not working in a direct competition situation then maybe it's okay.*

Office space	Five of the interviewees commented on this element. Four were positive and one was negative to the GHTC offering office space. Comments by interviewees were:

- Office space would be interesting but not co-working space because the startup is handling a lot of confidential data that cannot be shared with, or seen by any external parties;
- Office space would be good, but more in the form of having a war room, and being able to have discussions and brainstorm together with the GHTC;
- A setup that one startup mentioned was that all startups had their own room and all startups participating in the program sit adjacent to each other;
- Another startup, who also was affirmative, said *I think if you could sit with* [the GHTC] *for, I don't know, a couple of days a week or one day a week or something like that, and being able to be in their environment*

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and discuss with them during "fika", I mean just being in that environment, that would be engaging and that would be really good, that would be really interesting. So, getting closer and getting enough time to actually get into the details would be really interesting;

- The startup who was negative toward offering office space indicated that in his opinion it is not a good idea for startups to sit in the same building as the GHTC as this will affect the startup in a disadvantageous way. The interviewee rather emphasized the possibility for the GHTC to send their employees to sit where the startups are sitting and *get out of the building*.

Market access	All interviewees mentioned this element as something positive. Comments by interviewees were:

- The words used by the startups when talking about this element were very positive, examples are: *Distribution channels, yes, very interesting for us and any startup*; *first customer, definitely yes. Never say no to that*; *market access definitely interesting and both access to the distribution channels like already mentioned and yeah having* [a GHTC] *as a customer would also be a very big interest to us, very valuable as well.*; *to get partners and distribution channels are extremely interesting;*
- This is the most important element according to one startup;
- If the GHTC is offering market access, it probably means that the terms for the engagement imply a long-term involvement, which the interviewee was not certain was aligned with their current interest.

Financial support from incumbent company	Four of the interviewees commented on this element and they had various opinions. Comments by startups were:

- As stated by one startup *financial support, definitely yes*;
- Two of the startups mentioned the terms related to financial support. One startup mentioned *financial support it's always interesting, but it depends on what kind of terms of course*. Another startup stressed that they need financial support but also emphasized that the terms are very important to consider when receiving funding. If money is given to the startup and there are *no strings attached*, it will definitely be of interest, even small amounts. If the money is not given with no strings attached, it is preferred to minimize the complexity of the deal and the requirements to handle legal issues;
- If the GHTC might invest money in the startup in the end of the program, it is important to have clear terms from the beginning so that the startups know from the start what it takes to get an investment from the company;
- It would be more valuable to get competence instead of money, such as market access or software development;
- It would be interesting to receive money from the GHTC and if the startup partners with a GHTC it will be easier for them to raise money from external investors, hence the need to get funding from the GHTC itself decreases.

Help to raise funding from investors	One interviewee commented on this element. The comments were:

- It is *very important*. Further, to raise funding from investors is very time and effort consuming, especially the preparation of the necessary documentation, which takes away the focus from the core business.

Mentoring and coaching	All interviewees commented on this element and two of them were negative about it. Comments by interviewees were:

- The only thing that will help the startup learn is through working hands on with projects, therefore the startup disagreed with offering mentoring and coaching;
- It is very common to offer mentoring and coaching in other startup support institutions and it would steer the company too much, therefore it would not benefit the startup;
- They are not typically looking for mentoring and coaching, *but if we want to validate an idea, it can be interesting to have a bigger audience to discuss it through to see what points come in, and pros and cons around it so we can build something better*;
- It would be beneficial to offer both internal and external experts, but internal experts are especially interesting since that is part of the purpose of engaging with the GHTC. As the startup explained *otherwise the startup misses the connection to* [the GHTC] *as a company.* However, the startup mentioned that it depends on *what kind of people can* [the GHTC] *dig up internally*;
- It would be interesting to discuss, on a higher level about how to launch products in order to reach a global market.

Networking	Three of the interviewees commented on this element, and all were positive toward it. Comments by interviewees were:

- The value of getting access to the ecosystem of the incumbent company, and that networking is very important in general for them;
- Access to potential customers is of interest, according to two startups;
- Meeting with people from different divisions or departments within the GHTC would be interesting;
- Advice how to set up the channel to the market in the best way, including sales channels, production and delivering.

Events, workshops, structured training and lectures, demo day	Regarding events, four of the interviewees commented on this element. Comments by the interviewees were:

- They only want to participate in event that are related to the field in which they are active;
- The value of events depends on what kind of events that are offered, it is important to only engage in activities that they can learn from;
- They can organize and run their own events, but they need money and help with marketing. Therefore, the interviewee suggested co-hosting events such as hackathons, as an alternative. The purpose of these events for the startup is to let people try and learn their technology, getting in touch with potential customers and partners, and being able to market their solution to their end-customer;
- They are uninterested in participating in events that are only for branding purposes of the GHTC, however the startup would be interested in events where they can gain new insights.

Regarding workshops, two of the interviewees commented on this element. Comments by the interviewees were:

- Theme-based workshops are preferred;

- Output-based workshops are preferred, where there is a clear output and goal;
- It is interesting if it is connected to the specific field where the startup is active;
- The topics of the workshops should be general, but it should be optional to go and possible to drop out if it is not valuable.

Regarding structured training, one of the interviewees commented on this element:

- They can maybe join if something is organized, but that their startup does not require any specific training and they are not interested in that either.

Regarding demo days one startup commented on this element:

- Demo days are not necessarily interesting, but the opportunity to get in touch with investors are.

One startup emphasized the value of learning from the GHTC:

- It would be valuable to participate in workshops, events and demo days in order to learn how these activities are run in a GHTC, how they teach their staff how to use their technology as well as how to talk to and learn non-technical people about their technology. Another purpose of this would be for the company to understand how to integrate their solution with the platforms provided by the company.

Time horizon of involvement	Three of the interviewees commented on this element and they all emphasized that it depends on circumstances. Comments were:

- It depends on the task or activity that the engagement involves, according to two interviewees. However, one of the interviewees added *I think it's always better to do it for a short intense while, maximum six months;*
- As one startup mentioned *approximately three to five months, it depends on the structure and objective with the program.* However, the interviewee emphasized that if it's too short the startup doesn't have time to *really achieve anything,* but it is longer than three months the incumbent company *probably needs to have like set goals along the way what should be achieved along the way.*

Portfolio of other participants	Regarding having multiple startups participating simultaneously, four interviewees commented. The comments were:

- Mingling and working together could be great, but not sitting together due to the fact that they need *a walled space* in order to handle their data in a secure way;
- It might be lonely if there is only one startup at the time that is engaged with the company;
- It is beneficial to sit together with, or close to, other startups that are facing similar challenges, in e.g. hardware development;
- As another startup mentioned *it is probably good if you can complement each other, so why not.*

Degree of customization	Three startups commented on the degree of structure. Comments by interviewees were: ● The amount steering of the startup from the GHTC should be kept to a minimum, as this will decrease the innovation capacity of the startup; ● It would be good to have a quite fixed program in order to tackle all of the issues that a startup not tackle otherwise; ● Having meetings with the GHTC would give the structure needed to the program, *yeah, I think that some kind of structure is needed. So, for example, if we came to the offices of for example* [the GHTC] *then, it would be nice if we had some kind of meeting in the morning or something like that, and then we could work on our stuff. Then we meet again and so on.*
Frequent evaluations	Three interviewees commented on this element. Comments by the interviewees were: ● They are not looking for an incubation program and will rather turn to their advisory board for feedback and validation, or if it is a public product or service they will talk directly to customers or partners; ● It might be a good idea to set common goals related to what is expected to be done and when, and then follow up on them; ● For e.g. a six months program it would be reasonable to have an evaluation at three months and then toward the end after six months.
Post-program services	One interviewee said that if you have a mentor it would be valuable to keep in contact after the program.

Risk for startups to collaborate with a GHTC through a corporate-startup program

The risks that were mentioned during the interviews are related to that terms of the collaboration are unbalanced, including different risk profiles and that the GHTC does not have a real purpose with the collaboration; legal issues; that the startup is being slowed down by the GHTC; that the startup is inhibited in their way of working; and that the corporate-startup program will close doors for the startup in the future e.g. the startup will not be able to engage with other partners.

In order to mitigate these risks, it was suggested that the GHTC and the startup collaborate together in projects where both parties have stake and that can imply a beneficial outcome for both parties. Further, the risk of the collaboration is suggested to depend on the priority and importance the engagement has for the GHTC; the risk can be reduced if the GHTC sees the collaboration as high priority.

4.2 The Perspective of the Case Organization

A summary of the empirical findings from the case organization representatives is presented below. A thorough presentation of the answers, with references to the interviewees, can be found in Appendix D.

Objectives for a GHTC to host a corporate-startup program

Objectives with hosting a corporate-startup programs mentioned by the interviewees were that it may impact the current way of working in the GHTC; speed up innovation processes; learn how to improve and accelerate the internal businesses; learn how to validate a product and business plan as a startup; learn how startups go to market; access external innovations; access complementary products; enable expansion of current businesses; solve business problems; strengthen the brand; and gain financial returns.

Furthermore, one of the interviewees emphasized that a win-win situation is required in order for the GHTC to gain advantages from collaborating with startups; a win-win situation can be achieved through a sustainable business partnership where both parties can support the other party and improve each other's businesses. Further, it was mentioned that in order for the engagement to be successful the ambitions and strategies of both parties must be aligned. However, it was emphasized that it might be difficult. Moreover, according to the interviewee this implies that the terms and the arrangement should be clear from the beginning of the engagement, from both the startup's and the GHTC's perspective.

The offering and the elements in a corporate-startup program

Elements that were proposed to be offered in a corporate-startup program to attract startups, help them develop and grow whilst supporting the GHTC to achieve its objectives were: access to technologies and exchange of technologies; access to the brand of the GHTC to help increase the credibility of the startup; to provide elements focused around the elements that are the GHTCs USP toward other companies and support institutions; to provide internal expertise; to provide access to network; to provide market access; to be the customer of the startup; to provide product development; to provide business support; and to help the startup to set up a value chain.

Furthermore, it was suggested that; the most beneficial offering imply a win-win business partnership; that it is ensured that everything that is provided fills a real need that the startup has in order to provide real value for startups; that expectations

are aligned; and that the GHTC ensure minimum steering and interference with the startup; and that the program is customized to the startup.

Comments on the list of resources, services and activities

Table 4.2 below is based on a list presented during the interviews (found in Appendix B), that the case organization representatives commented on and subsequently prioritized the five most important elements in an offering of a corporate-startup program. A compilation of the prioritized elements is found in section 4.4 *Prioritization of Elements.*

Table 4.2. Comments from the interviewed representatives from the case organization based on a list of suggested elements

Element in list	Comments from representatives of the case organization
Customized product development	Three perspectives were brought up regarding this element and these were: ● Access to a GHTC's experience and knowledge in product development can attract startups and hardware and software is something the GHTC can contribute with, according to two representatives; ● It is valuable for the startup to have the core competences inside the company, and thus not outsource any of these parts to the GHTC, according to two representatives; ● Providing support in a consultancy manner, i.e. giving advice, would be a valuable option, according to two representatives. However, one mentioned that more specific expertise and unique resources is preferable to offer. Further, one suggested giving hands-on, practical support, as an alternative.
Customized business development	Two representatives commented on this element and they brought up two perspectives, and these were: ● Business development is an area where a GHTC has expertise and as the interviewee suggested *it is something we can offer and that is very relevant for many startups;* ● There are vast differences between a large and a small company in the field of business development, and thus it might not be valuable for the startups to receive these kinds of services from a GHTC. However, the interviewee believes that the large company rather can learn from the startup in this field.
Customized development of support functions	Two of the representatives gave their perspective on this element and these were: ● All support functions stated in the list would be valuable to provide, but the challenge is that they can be limited in a GHTC. However, if there is an initial negotiation with the startup regarding what they need, there is a possibility to offer support functions if these are of high value to the startup; ● The differences in nature of a small and a large company implies challenges to provide support functions, since the GHTC's way of performing these functions and the GHTC's competence in this area does not match with what the startup needs, as the interviewee puts it, it *doesn't*

rhyme with startups.

Technology transfer	All representatives commented on this element and everyone were positive toward providing it. Comments by the interviewees were:

- When talking about the GHTC's technologies one mentioned *this is concrete value to the startup*;
- A GHTC can provide their portfolio of *IP/ patents/technologies*, so that startups are able to build upon and integrate the elements in this portfolio;
- Providing platforms are important and was positive toward it, as the interviewee stated it can be *very useful and practical if they* [the startups] *could leverage on our platforms.* This interviewee also brought up that the GHTC can leverage on the startup's platforms. The representative also mentioned that *we have a lot of tools and small platform that can be very useful for startup*.

Office space	Three perspectives were brought up regarding this element, and everyone were open to the option of providing office space. However, they emphasized that it should only be an option, not an obligation, to sit at the GHTC's facilities. Further comments were:

- An option is to offer the startups office space at other support institutions as well;
- It would be valuable for the GHTC that the startup sits at their office, but it also needs to provide value for the startup;
- Access to technology and competence are arguments for the startup to sit at the GHTC.

Market access	Three representatives commented on this element, one was solely positive whilst two also indicated challenges. Comments by interviewees were:

- Market access is very important and valuable for the startup. Further, the interviewee stated that both access to the GHTC's distribution channels and being the first customer to the startup could be feasible options;
- Providing access to sales channels may be a challenge since it is not the GHTC's product. Other alternatives would instead be to brand the startup's product as *supported by* the GHTC, for the GHTC to present that they support these startups, make introductions on behalf of the startup to potential customers and open doors. However, it could be a part of the portfolio in the long-term;
- Access to marketing and sales would give concrete value to the startup. However, the interviewee mentioned two conditions for this, which were that *the startup need to do something that is appropriate to sell in our channels or together with our products* and it needs to be a win-win.

Financial support from incumbent company	Regarding funding, all representatives elaborated on it and highlighted challenges with offering it. Comments by interviewees were:

- It would be an option to provide some money, but it should not primarily be something that is used to attract the startups;
- It is an option to provide funding, however the objective with establishing a corporate-startup program is not to compete with venture capitalists but to offer value by finding synergies between the startup and the GHTC;
- Funding is valuable for startups and to provide a relatively small amount of money would be a possible option;

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	• It is more valuable to get resources, assets and expertise than money from a GHTC and *it is a plenty of cash out there*, thus it is not needed to provide money. Further, being an investor implies long-term commitments.
Help to raise funding from investors	One of the representatives commented on this and suggested: • The GHTC can provide networking in the community and introductions to arenas where funding can be raised.
Mentoring and coaching	All of the representatives commented on this element and everyone was hesitant toward it to some extent. Comments by interviewees were: • There are other startup support institutions providing mentoring that are difficult to compete with; • The GHTC have a lot of expertise to provide but however, the competence to mentor startups may not be able to find within the company; • The mature startups investigated in this study will probably not be in need of mentoring, but still the GHTC can provide mentoring and coaching in areas they have experience in.; • It would be an option to collaborate with an external person to provide mentoring.
Networking	Everyone elaborated on this element and were positive toward providing it. Comments by interviewees were: • Networking is *very relevant* and network to customers, business contacts and suppliers were highlighted as most relevant; • The networks provided should be related to the technologies and markets of the GHTC, in order to make sure that unique value is provided to the startup that cannot be accessed by other support institutions.
Events, workshop, structured training and lectures, demo day	Two representatives commented on this. Comments by interviewees were: • There is a possibility that the startup can tap into the existing internal events, workshops, trainings and demo days; • These activities need to be valuable for the startup, in order to be sure that the startup's time is not wasted. Further, the representative questioned if this is a competitive advantage for the company, as this interviewee was pushing for only providing elements that are unique for the company.
Program practicalities	Two representatives commented on program practicalities and the comments were: • Regarding program practicalities one interviewee mentioned *it is difficult to answer, it depends case by case* and argued that program practicalities will not be the most important issues; • Regarding degree of customization, one representatives suggested that the program be tailored to the startup.

Elements that were uncommented were: time horizon of involvement/duration, portfolio of other participants, frequent evaluations and post-program services.

Potential risks of engaging with startups and how to mitigate these

Risks that were mentioned from the perspective of the case organization were that the expectations are misaligned and the GHTC cannot offer what the startup needs; no ROI due to lack of knowledge regarding how to create a successful engagement; risks related to legal issues and IP; and that the startup fail.

Suggested ways of how to mitigate the risks were that it is clearly defined what the GHTC can and cannot offer; the expectations of the outputs of the engagement are aligned from the beginning, from both parties; to solve as much of the legal agreements (e.g. setting up contracts) before the engagement commences and that the GHTC is clear about what kind of IP that is shared; and that only startups that have a substantial amount of capital are accepted into the program.

4.3 The Perspective of the Subject Matter Experts

A summary of the empirical findings from the subject matter experts is presented below. A thorough presentation of the answers, with references to the interviewees, can be found in Appendix D.

Potential benefits for a GHTC to engage with mature startups in the IoT-sector

Proposed benefits for a GHTC to engage with a mature startup in the IoT-sector were that: it can strengthen the brand and employer branding; it can imply learning opportunity; it can help reduce inertia; it can help increase the adaptability of the GHTC; it can imply a valuable opportunity to exchange ideas; it can help the GHTC to gain inspiration from startups; it can reduce the threat highly innovative startups constitute toward established companies; it can have a positive impact on the corporate culture; it can help increase the creativity in the GHTC; and it can enable to GHTC to get access to technologies. As proposed by one interviewee: *bringing new people in and new ways of working will be a big benefit for the big company.*

Potential risks and challenges for a GHTC to engage with mature startups in the IoT-sector

Proposed risks and challenges for a GHTC to engage with a mature startup in the IoT-sector were related to if the corporate-startup program is unsuccessful; if the GHTC loses talent to the startup; to have the startup as a supplier and the GHTC becomes dependent on the startup; if there is a lack of alignment it can be difficult for the two parties to coordinate with each other; the different time perspectives before the companies expect profits which can lead to misaligned expectations regarding when results are expected.

Furthermore, it was suggested that one way to mitigate these risks is to be clear with, and align, expectations and objectives, from the beginning of the program.

Potential benefits for mature startups in the IoT-sector to engage with a GHTC

The subject matter experts proposed several benefits for mature startups in the IoT-sector to engage with a GHTC, these were: receive financial support; access experts that is hard to find elsewhere; access hardware development; access technologies; access markets by selling directly to the GHTC or by accessing their customer base; gain legitimacy and power by piggybacking on big brands and communicate the engagement; and access customized value chain support.

Potential risks for mature startups in the IoT-sector to engage with a GHTC

The subject matter experts suggested the following potential risks related to when mature startups in the IoT-sector are collaborating with a GHTC in a corporate-startup program: the program can slow the startups down; unbalanced distribution of power; if the GHTC becomes the customer of the startup it may imply complicated business agreements and that the startup gets too dependent of one customer; scaling too fast; strangled by rules and activities; and legal risks. Further it was emphasized that startups have more to lose than the GHTC which increases the risk for startups.

These risks were suggested to be mitigated by ensuring a win-win collaboration; having people within the organization that are dedicated and authorized to make decisions with their own budget in order to not slow the startups down; simplify the business agreements; set up pilots that are easy to get started; ensure that the starting point for collaboration is *done quickly and in a way that is sort of no strings attached, it can be ended at any time;* and the GHTC should enable sustainable scaling and be careful when supporting startups to reach customers, so that the startup do not scale too fast.

Critical aspects for a beneficial corporate-startup program

Two aspects were especially emphasized to support a beneficial corporate-startup program. These are that the offering of the program should be customized to fit the startups participating in the program, and that the objectives and intentions of the GHTC should be clearly defined.

What should be provided by a GHTC to mature startups in the IoT-sector

The opinions of the subject matter experts regarding what should be offered to startups from a GHTC were: to enable access to the brand to help the startup to build

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credibility and have a legitimate reference; to enable access to relevant markets and the customer base; to sell the products directly to the customers of the GHTC; the GHTC recommend the startup to their customers; to provide industrialization knowledge, including channels to suppliers and manufacturers as well as knowledge about how to handle them; to enable the startups to be located close to their customers; to leverage the resources of the GHTC; to enable startup learning; to allocate an internal champion; and to focus the offering around the USP of the GHTC i.e. to offer elements that cannot easily be found elsewhere.

Further it was emphasized that the program should be flexible and customized according to the startups needs and challenges; that the objectives and expectations of both parties should be clear; and adapt services to the startup's needs

Comments on the list of resources, services and activities

The Table 4.3 below is based on a list presented during the interviews (found in Appendix B), that the subject matter experts commented on and subsequently prioritized the five most important elements in an offering of a corporate-startup program.

Table 4.3. Comments from the interviewed subject matter experts based on a list of suggested elements

Element in List	Comments from subject matter experts
Customized product development	All experts commented on customized product development. Comments by interviewees were: ● Customized product development would *probably be the most valuable;* ● Two other experts saw benefits in the area, but also elaborated on potential downsides. Specifically, as a high-technology startup, *you might not be able to afford the sheer cost of development* so this is *definitely important;* ● It is uncommon for large companies to develop the hardware for a startup in a corporate-startup program, they rather support the startup in finding a network. However, the expert indicated that it would be *fantastic* if the company would provide resources that actually develop the product for or with the startup. Specifically, regarding development of hardware, two experts expressed their thoughts: ● This has become more available and affordable for startups today; ● Hardware is an area where the GHTC can provide industrialization expertise and be *a great partner.* The expert specifically believed in providing expertise and support of hardware development but did not believe in actual development of the hardware as it would be a negative ROI for the GHTC and hard for the startup to be self-sustained in the long-run. Furthermore, the expert expressed that industrialization includes access

to suppliers and production sites, and advise of how to interact with them, which would be valuable for the startup.

Specifically, regarding development of software, two experts commented:

- Both mentioned that they do not believe in it. According to one of them, *the large company cannot offer much that small teams don't have* in this area.

Specifically, regarding security solution development, one expert commented:

- It is a valuable service to provide, since it is an expertise that a small team typically lacks. However, the GHTC needs to adapt to the startup's needs in this area.

Customized business development	Four experts commented on this element. Three of the experts highlighted the differences between a small and large company and that it implies difficulties in providing support in these functions. Comments about differences were: - According to one expert, *the way the typical large corporation thinks of their business development may not be so useful to build a marketing plan for a startup based on knowledge gained in a large corporation.* However, reviews from the GHTC of the startups' business development elements could be valuable; - A GHTC can help a small company in development of business model/plan, according to two experts, and as one of them expressed: *I don't think* [the GHTC] *can do a business model that is better than the startups you described already have done;* - Marketing, management team/skills, business skills are mentioned as areas where differences imply that they should not be provided.

Specifically, regarding marketing, two experts commented on this:

- Large companies have large scale marketing and is slower whilst startups' marketing *is about transparency, being yourself and engaging people in the story.* The large company can provide reach, but it is dangerous to scale too fast. Further, if it will include the larger company's brand it will become a sensitive issue;
- It is beneficial for startups, but the experts in this area is needed to secure revenue for the GHTC.

Regarding management team/skills, two experts commented on this:

- Success factors in this area are too different in a large company and a startup;
- Larger firm has more to learn from the startups in this area, than the other way around.

Regarding business skills, two experts commented on this:

- A GHTC cannot do this better than startups;
- Due to the differences of a large and small firm, *a large company can teach a small company the inner workings of a large company,* which include issues such as structure and communication channels, which especially

valuable for a startup working in the business-to-business (B2B) segment.

Furthermore, one expert commented customized business development by saying:

- That elements in this area *are important but there are other functions that are more important*;
- The element *Innovation Processes* should also be provided to startups. Innovation Processes include an understanding of how to develop products efficiently, to provide support with prototyping and to provide opportunities to test their product e.g. by talking to customers and experienced employees within the company to get feedback.

Customized development of support functions	All experts commented on this element. One expert was positive toward support functions, saying *correct, fine*. Further comments about what support functions that would be valuable to provide were:

- IP lawyers (mentioned by two);
- Legal (mentioned by three);
- Technological assistance, that should be very specific according to one (mentioned by two);
- Marketing.

Regarding IP lawyers and legal support, one expert indicated:

- It may be valuable because it is expensive, but the large company really need to adapt to the small company's perspective

Two of the experts highlighted that the vast differences between a small and large company was a reason why the GHTC should not provide the following elements:

- HR (mentioned by two)
- Administration (mentioned by two)
- Accounting (mentioned by two)
- Mentioned reasons were that the cultures are too different, that the large companies do not know how to manage these functions for few people and that there are many tools to handle these functions.

Technology transfer	All experts commented on this element and expressed positive opinions, but one expert was negative about integrating technologies. Comments by interviewees were:

- Technology transfer *I think can be extremely important*;
- This is *possibly extremely important*, both to access technologies but also *fantastic* to be able to co-develop technologies;
- This could be interesting since the GHTC *could have assets on which startups could innovate and providing those could make huge difference and win-win situation for both sides.*

Two experts mentioned providing patents as one attractive option:

- It is suggested that a beneficial alternative would be to provide unused patents to the startup, which would be really powerful for startups;
- Technology transfer is one of the most valuable assets. This can be

provided either by licensing the startup's technology or if the GHTC owns IPs that can be provided to the startup;
- Basic technologies would be most beneficial, but if the two parties are able to complement each other, becoming dependent can be a good thing.

Furthermore, one expert commented on this element:

- For a startup with a B2B business model, offering expertise on how the startup can build their product to fit the GHTC's needs is more preferable than exchanging technologies;
- In the case of integrating technologies, it would imply too much legal work and paperwork with the business agreement. Hence, having ownership separate for as long as possible is a suggested success factor *and then if there is a really perfect match decide upon those things later*.

Office space	Four of the experts commented on office space and no one was very positive, the comments were: • Two experts did not believe in office space and one did not care about it • One expert said *we all need a place to work right* but emphasized that it is not a competitive advantage to provide. However, for the GHTC it would be valuable for their learning, from the startup, to provide office space and sit in proximity.
Market access	All of the experts were positive toward market access. Comments by interviewees were: • Development of sales is commented by two experts with *obviously* and *often the reason startups want to engage;* • Getting access to the first sales is *important for a startup* and *the network, sales and legitimacy is what the startup lacks*; • Regarding having the GHTC as a first customer, one expert mentioned *definitely;* • Regarding distribution channels, one expert mentioned that it can be good especially for software.
Financial support from incumbent company	Financial support and funding is, according to three experts, valuable for the startups. Comments by interviewees were: • As one expert expressed, *it's a good idea* and *startups need financial support to compete*; • Two of them were positive but also mentioned the consequences of getting access to funding, e.g. loss of equity and control.
Help to raise funding from investors	Two experts mentioned this element. Comments by interviewees were: • Arranging funding is *always interesting;* • It is not only support to raise funding, being a part of a corporate-startup program will also make the startup more attractive for investors.
Mentoring and coaching	Three experts commented on this and all of them set high demands on mentoring and coaching. Comments by interviewees were: • This can rather be provided by other institutions, *it just doesn't really make sense that* [the GHTC] *offers startup advice to a startup, it's better that they*

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offer corporate advice. However, experts that represent their customers and specific skills are valuable*;*
- According to one expert, *there are more coaches than startups*, and only if it is extremely skillful and experienced coaches that are heavily engaged in personalized training it would be interesting, especially if the startup is inexperienced;
- Large companies need to understand that their knowledge is related to a large company, not a startup.

Networking	All experts commented on this element and all were positive to it to some extent. Comments by interviewees were:

- As one expert argued *I think that that networking is really an asset*;
- For *the survival of a startup network is extremely important* and startups usually lacks network;
- Networking is a potentially valuable element);
- Network is something the GHTC should provide and it is valuable to access parties that can help the startup e.g. customers and suppliers;
- Regarding access to investors, it can be easier for the GHTC to be an investor than to provide access to network of other investors;
- Regarding access to potential customers, it may be valuable but only at the right scale so that the startup does not scale too fast;
- Regarding access to business contacts and partners, it would *definitely* be valuable to provide and refer to people within the GHTC that are experienced in the industry and have large networks;
- Regarding access to suppliers, two experts mentioned it is valuable. It is difficult to find good suppliers and it would therefore be valuable if it is a match, according to one expert. However, according to another, only if they can produce at the startup's scale, i.e. smaller scales;
- Regarding experienced entrepreneurs, there are more of them with relevant experience outside the GHTC at other startup support institution**s**;
- Regarding a peer support group and alumni network can be valuable to manage stress and be with people that understand your situation, according to one expert. However, it is described as a good side effect that can be find elsewhere;
- The value of access domain experts and to build contacts in the company if confirmed.

Events, workshop, structured training and lectures, demo days	Three experts commented on this element and one was positive whilst two were more hesitant. Comments by interviewees were:

- According to one expert, *many of these things* [events, workshop, structured training and lectures, demo days] *are valuable, it's just that they don't all play to* [the GHTC]*'s strength*;
- According to another expert, *I believe less in these kinds of events and workshops and trainings.* Further, the expert emphasized that it needs to be tailored to be valuable: [events, workshop, structured training and lectures, demo days are] *the least important thing unless you have a tailored extremely expensive type of training, but given the cost of a tailored training, I would not do this.*

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| Portfolio of other participants | Two experts commented on this element and the comments were:
• It is valuable to have a couple of startups in the portfolio, according to two experts, and the reasons for this were that they get access to peers that understand each other (E1), that they can learn from each other, that they can create a network and that it induces some peer pressure between them. |
| Degree of customization | Two experts elaborated on this element and the comments were:
• As one suggested: *try to use very little structure to start with and learn over time how much is needed*;
• There is a certain need for structure when setting up a corporate-startup program, but it is essential to not make it too structured and destroy the creativity. |

Elements that were uncommented were: time horizon of involvement/duration, frequent evaluations and post-program services.

4.4 Prioritization of Elements

All of the interviewees were asked to prioritize amongst all elements discussed during the interview that they think would be of most value and/or of highest importance to offer in a corporate-startup engagement. The result of this is presented in Table 4.4 below.

Table 4.4. The result from the prioritization from the interviewees. If **a box contains an X it means that the interviewee referred to the element without any expectations or alterations. If the box contains an X with a number, it means that the interviewee referred to the elements with an exception or alteration. These are described as: X1: Refers to that customized product development should be offered but only related to hardware development; X2: Refers to security solution development specifically; X3: Refers to development of marketing plan; X4: Including teaching the startup about innovation processes; X5: Refers to only offering marketing specifically; X6: Refers to access to technology assistance, IP lawyers, legal assistance, in the short-term; X7: Specifically having the GHTC as a customer; X8: Only applicable in a long-term engagement; X9: Refers to that the GHTC should help the startup to raise funding from investors; X10: Refers to financial support from incumbent company; X11: Refers to helping the startup to become more attractive toward investors; X12: Refers to mentoring specifically and not coaching; X13: Refers to access to internal experts;X14: The interviewee do not want to participate, but rather to co-host events, workshops, and demo days together with the GHTC**

Element	SU A	SU B	SU C	SU D	SU E	SU F	CO R A	CO R B	CO R C	CO R D	EXP A	EXP B	EXP C	EXP D	EXP E	TOT
Customized product development			X1		X			X	X	X	X2	X		X		8
Customized business development			X		X			X	X			X	X3		X4	7
Customized development of support functions						X5	X		X		X6	X				5
Technology transfer	X	X			X		X	X	X	X				X	X	9
Office space				X												1
Market access	X	X7	X	X	X	X		X	X	X	X8	X		X	X	13
Funding	X	X9	X	X				X		X10			X		X11	8
Mentoring and coaching				X			X12					X13				3
Networking	X			X			X					X	X		X	6
Events, workshops, structured training, and demo day	X14						X						X			3
Collaboration on projects			X			X										2
Access to domain experts			X													1
Support with CE certifications				X												1
Brand													X			1
Access to market research						**X**										1

4.5 Summary of Empirical Findings

The empirical findings are collected from 15 semi-structured in-depth interviews with three perspectives: six representatives from mature startups in the IoT-sector, four representatives from the case organization, and five external subject matter experts. A Summary of the empirical findings can be found in Table 4.5, Table 4.6 and Table 4.7 below.

Table 4.5. Summary of empirical findings from the startup perspective

Topic	*Summary of findings*
Current situation based on strengths, weaknesses, challenges and needs	It was evident that the startups are in need of external support mainly related to: competence, especially technological expertise; hardware development; financial capital; and market access.
Attractiveness of engaging with a GHTC	It was evident that an engagement would enable startups to, at least partly, develop and grow. However, there were several prerequisites about the engagement mentioned, mainly related to: value for both parties; not being slowed down; and real purpose for both parties.
Valuable elements to be provided by a GHTC in an engagement in order to develop and grow (open question)	What elements that would be valuable to be provided differed across the startups but were mainly related to: networks; brand; customer- and market access; expertise (especially technological); product development; financial capital; access to technologies.
Valuable elements to be provided by a GHTC in an engagement in order to develop and grow (based on a prompted list, found in Appendix B)	It was evident that the preferences differed among the startups. The elements that was especially emphasized as valuable were: technology transfer, market access and networking. The top prioritized elements by startups can be found in section 4.4.
Risks to engage with a GHTC	It was evident that there are several risks to initiate an engagement with a GHTC, that need to be mitigated. The risks were mainly related to: unbalanced terms of engagement; no real purpose for the GHTC; legal issues; being slowed down.

Table 4.6. Summary of empirical findings from the case organization perspective

Kind of data collected	*Summary of findings*
Objectives to host a corporate-startup program	It was evident that there are several objectives for a GHTC to engage with startups. These were mainly related to: impact the way of working; access external innovations; expand current business; strengthen brand and create a win-win collaboration.
Valuable elements to provide to startups in order to enable them to develop and grow, that are beneficial for the GHTC (open question)	The mentioned elements were mainly related to: market access; technology transfer; product development; expertise related to the value chain and the business; brand; networks; real value for both parties; aligned expectations; customization; focus around the USP of the GHTC.
Valuable elements to provide to startups in order to enable them to develop and grow, that are beneficial for the GHTC (based on a prompted list, found in Appendix B)	The preferences differed, but the elements that was especially emphasized as valuable were: customized product development; technology transfer; and networking. Further, two elements that was emphasized as valuable for startups to get support with, but also indicate challenges to provide, were: market access and financial capital. The top prioritized elements by the case organization can be found in section 4.4.
Risks to engage with a startup	It was evident that there are several risks to initiate an engagement with a startup, that need to be mitigated. The risks were mainly related to: legal issues; startup failure; and misaligned expectations.

Table 4.7. Summary of empirical findings from the subject matter experts

Kind of data collected	*Summary of findings*
Potential benefits for a GHTC to engage with mature startups in the IoT-sector	It was evident that there are several benefits for a GHTC to engage with startups. These were mainly related to: exchange of ideas; impact the culture; strengthen brand; get inspired and impacted by startups' way of working; access to technologies.
Potential risks and challenges for GHTC to engage with mature startups in the IoT-Sector	It was evident that there are several risks for a GHTC to initiate an engagement with a startup, that need to be mitigated. The risks were mainly related to: lack of alignment; different time perspective; having the startup as a supplier; lose talent; and the risk of launching an unsuccessful program.
Potential benefits for a mature startup in the IoT-sector to engage with a GHTC	It was evident that there are several benefits for a GHTC to engage with startups. These were mainly related to: financial support; expertise; customer- and market access; hardware development; access to technologies; gain legitimacy; and value chain support.
Potential risks for a mature startup in the IoT-sector to engage with a GHTC	It was evident that there are several risks for a startup to initiate an engagement with a GHTC, that need to be mitigated. The risks were mainly related to: unbalanced risk profiles; unbalanced distribution of power; slowing down the startup; complicated business agreements; becoming too dependent as a supplier to the GHTC; legal risks; and scale too fast.
Critical aspects for a beneficial corporate-startup engagement	Two aspects were mentioned as critical for a beneficial corporate-startup engagement for both parties, and these were: a customized offering and that the GHTC has defined their objectives with the engagement.
Valuable elements to be provided by a GHTC to a mature startup in the IoT-sector in an engagement (open question)	The highlighted elements were mainly related to: brand; market access; support to set up a value chain; customized program; clear objectives and expectations; having an internal champion; and enable the startups to learn. However, they also emphasized challenges related to access to brand and market access.
Valuable elements to be provided by a GHTC to a mature startup in the IoT-sector in an engagement (based on a prompted list, found in Appendix B)	It was evident that the preferences and opinions differed among the experts. The elements that were especially highlighted as valuable to provide were: technology transfer, market access and networking. Further, the experts emphasized challenges with providing several elements, e.g. business development, support functions, and mentoring and coaching. The top prioritized elements by experts can be found in section 4.4.

5 Analysis and Discussion

In this chapter, identified themes related to the offering of a corporate-startup program for mature startups in the IoT-sector, hosted by a global high-technology company are analyzed and discussed with regards to identified issues and patterns in the empirical data and the current literature.

As the purpose of this study is to identify critical success factors in the offering of a corporate-startup program, the focus of this section is to analyze and discuss potential factors in order to determine their impact on the offering. Hence, the empirical findings and current theory are analyzed and discussed with regards to the research question. The analysis is based on ten overarching themes that have been identified based on the collected empirical data and theory. The themes stem from the data analysis performed by the researchers, as described in 2.3 *Data Analysis*. Since the themes were derived from the empirical data and theory, which were focused on the offering of a corporate-startup program, the themes also represent factors that impact the offering of a corporate-startup program. Below the factors, that each theme represents, are analyzed and discussed with regards to the empirical findings and current theory. Further, it is discussed whether the factor is regarded as a critical success factor, by assessing its impact on the attractiveness for mature startups in the IoT-sector, if it enables the startups to develop and grow, and if the program enables the GHTC to achieve a beneficial outcome.

5.1 Process of Initiating the Program

The process of initiating the corporate-startup program is, as acknowledged in the empirical findings and theory, considered a factor in the offering of a corporate-startup program. The initiation process includes the degree of simplicity for the startup to initiate the program, and the alignment of expectations and objectives between the startup and the GHTC. The latter includes aligned expectations and objectives of the offering, the intention and the outputs of the program.

5.1.1 Simplicity of Initiating the Corporate-Startup Program

One aspects in the initiation process is the degree of simplicity. In the empirical data, it is indicated that it is critical to ensure that the procedure of initiating the program is simple. One of the startups' prerequisites to engage with GHTCs is to

not be slowed down or have to deal with bureaucracy. Hence, a complex and time-consuming initiation process will not attract startups. This is in line with theory that suggests that companies should keep the degree of bureaucracy low and make it as simple as possible for startups to engage with it (Bannerjee et al., 2016; Mocker et al., 2015). Further, large companies work at a slower pace, with more rigidity and have longer decision-making processes than startups do (Hill & Rothaermel, 2003). Therefore, the probability that the initiation process of the program will be time-consuming is high, and thus there is a risk that it will slow the startups down. Hence, the simplicity of the initiation procedure is a critical aspect to consider in the offering of a corporate-startup program.

Moreover, in the empirical findings it is emphasized that business agreements need to be simplified and specifically, legal issues need to be addressed in the initiation phase of the program. It is evident, from all perspectives in the empirical findings, that legal issues are commonly considered a risk for the two parties participating in a corporate-startup program. Legal aspects imply limitations due to non-disclosure agreements (NDA) and issues related to IP. Because legal issues are indicated in the empirical data to be of high importance, the need to set up contracts in the beginning of the program is critical. Further, it is indicated that complex legal agreements may be time-consuming to understand, and it may imply that the startups need to hire lawyers in order to interpret and understand the agreements fully, which may be expensive for a startup. Therefore, because startups are not usually specialized in legal agreements, it is important that contracts are simple to understand. The importance to address legal issues in the beginning of the program and simple agreements are in line with what is suggested in theory, that contracts should be simple and standardized, and issues related to IP ownership should be clear already from the beginning of the program (Bannerjee et al., 2016; de la Tour et al., 2017).

5.1.2 Align Expectations and Objectives

Additionally, another aspect to consider in the initiation process is the alignment of expectations and objectives of the two parties. The importance for the two parties in a corporate-startup program to align their expectations and objectives from the start, is evident from the empirical data. This is in accordance with theory, that suggests that objectives and expectations should be clear and set from the beginning, from both parties (Bannerjee et al., 2016; de la Tour et al., 2017; Kohler, 2016). In the empirical findings, it is indicated that alignment of objectives and expectations will ensure real value for both parties, a win-win collaboration, and an efficient and effective program. In theory, it is further suggested that the objectives of the two parties should be defined from the beginning in order to enable a win-win partnership (de la Tour et al., 2017). Hence, the probability of success of a corporate-startup program is dependent on that the objectives are clear and aligned from the beginning.

In the empirical data, there are several suggestions mentioned related to how the expectations and objectives can be aligned. These are that the GHTC clearly defines what it can and cannot offer to the startup; that there is an initial negotiation about the startup's needs so that the GHTC easier can ensure that the startup's most critical needs are supported in the program and; that the GHTC is clear on the terms of the program in the beginning. This is reinforced by theory, that suggests that the company should be aware of the startups' needs and objectives from the beginning, in order to settle priorities for the program, and that the company should be upfront with timings and the process from the beginning (Bannerjee et al., 2016; Kohler, 2016).

In summary, it is evident from the empirical findings and literature that it is critical to ensure that the procedure of initiating the program is simple, i.e. not time-consuming or complex, and that the expectations and objectives for both parties are aligned from the beginning. This is critical in order to attract startups and enable a beneficial outcome for both parties and a successful program.

5.2 Financial Support

One frequently recurring topic in both theory and in the empirics, is financial support, and whether it should be provided to the startups in a corporate-startup program or not. It is evident from both literature and the empirical data that financial support is critical for most startups in mature phases and *funding* is the third most frequently prioritized element, as shown in Table 4.4: *The result from the prioritization from the interviewees*. However, it is evident that the consequences of offering financial support may imply difficulties.

According to the study performed by CB Insights (2018) one of the most common reasons for startup failure is lack of financial means. Furthermore, multiple of the main challenges for startups in growth phases are related to financial support (Churchill & Lewis, 1983; Marmer et al., 2011). Additionally, ScaleUp Institute (2017) suggests that one of the five barriers that startups need to overcome in order to scale up their business is access to financial means. Further, financial support is mentioned by multiple scholars as part of an attractive offering to startups, as seen in Table 3.7: *Elements suggested to be offered to startups*.

Further, it is evident from the empirical data that financial resources are both a weakness and a challenge for startups. The lack of financial resources is suggested to slow down the development and might threaten the survival of a startup. Further, it is indicated that if the GHTC provides financial support it would likely help the startup, even if it is a small amount. Additionally, it is suggested in theory and the

empirics, that hardware development, which is highly relevant for startups in the IoT-sector, is capital intensive and require substantial financial means (Hussain, 2017). This further increases the need for financial resources for startups in the IoT-sector. Moreover, these startups may have difficulties finding investors due to the fact that the development of hardware is expensive, as indicated in the empirical findings.

From the perspective of the case organization, it is partly suggested that providing a small amount of money would be a viable option, however, it is suggested that financial support should not be the main focus of the offering. Further, it is indicated from the case organization that the willingness to provide *smart money* i.e. resources, assets and expertise is higher than to provide financial support due to the belief that smart money is more valuable for mature startups in the IoT-sector to receive from a GHTC. The belief that there are many alternative options for startups to access financial capital, from external investors also supports this argument. Further, the case organization highlights the consequences of providing financial support in exchange of equity, by mentioning that being an investor implies long-term commitments.

However, it is indicated that startups are aware of the potential consequences of receiving financial support from an external party. Examples such as loss of equity and complex solutions including e.g. convertible loans, are emphasized. Startups' opinion regarding the attractiveness of receiving financial support directly from the GHTC is highly dependent on the terms and consequences it implies. Therefore, it is suggested that it should preferably be provided as grants with no strings attached. From the expert perspective, the opinions providing financial support are diverse due to consequences such as loss of equity and dilution of power and control, even though the need for financial capital for startups is acknowledged. Therefore, it is important for startups and the GHTC to be aware of the terms of providing financial support in a corporate-startup program and to align these with the intentions of the two parties.

In summary, startups' need for financial capital is widely acknowledged by the empirical data and current literature. However, the consequences for the GHTC to provide, and for the startups to receive financial capital, is emphasized in the empirics. Thus, the opinions are diverse regarding if financial support should be provided by a GHTC in a corporate-startup program, and the terms of receiving financial support is important for startups and the GHTC to consider. Therefore, the ability for the GHTC to reach their objectives with the program, as well as the attractiveness for startups of receiving financial support from a GHTC in a corporate-startup program, is dependent on the terms under which the support is provided and the intentions of the two parties.

5.3 Balance the Terms of the Collaboration

The importance of balancing the terms in a corporate-startup program is evident from both the empirical data and current literature and is especially emphasized in the empirics in order to ensure mutual commitment. Balancing the terms of the corporate-startup program includes ensuring that the outcome imply benefits and increased value for both parties and that the risk profiles for both parties are balanced. Hosting a corporate-startup program can be interpreted as a form of *coupled process open innovation* in which two complementary parties are collaborating. In this set-up, it is crucial to *give and take* in order to achieve success (Enkel et al., 2009). Hence, in order to achieve such a set-up, it is fundamental to balance the terms of the engagement.

5.3.1 Balance the Value

One aspect of balancing the terms, and ensure commitment from both parties, is that the program implies benefits and increased value for both parties. To offer a corporate-startup program that enables this is essential in order to create a successful corporate-startup program, where both parties can leverage each other's businesses, according to the empirical data. Further, a win-win collaboration is referred to as a successful collaboration from the case organization perspective, and a prerequisite from the startup perspective.

In theory, it is suggested that the company needs to deliver real value to the startups in order to achieve a successful engagement (Bauer et al., 2016; Kanbach et al., 2016). Due to the differences in nature between a GHTC and a startup there is a viable possibility to create a win-win collaboration, as one of the parties can supply what the other lacks (Berchicci & Tucci; Kohler, 2016; Mocker et al., 2015). As suggest in literature, to create a mutually beneficial corporate-startup program is challenging and in order to do so, the offering needs to be designed to bridge the challenges of the startups and the established company (Mocker et al., 2015).

To ensure that the corporate-startup program is beneficial for both parties, it is recommended in literature that an employee from the GHTC, with an understanding for both perspectives, can act as a go-to-person for both parties and help ensure that the interests of both parties are met, referred to as an *internal champion* (Bannerjee et al., 2016; Kohler, 2016; Mocker et al., 2015). This is also emphasized in the empirical data.

Further, to ensure benefits for both parties, it is evident from the empirical data that both parties in a corporate-startup program needs to have a purpose with the

engagement. Further, the GHTC needs to understand why it wants to engage with a specific startup, what value that collaboration can bring to the GHTC, and make the collaboration a high priority, according to the startups. Further, it is emphasized that the GHTC should have clearly defined their intentions and objectives with the collaboration, according to both the empirical data and theory (Bannerjee et al., 2016; Kupp et al., 2017; Mocker et al., 2015). It is also suggested that the GHTC needs to be transparent regarding their objectives of the program and communicate these internally and externally. Also, it is indicated that the startup needs to have a clear vision of their needs for support and see real value with the engagement, according to the case organization. This is reinforced by theory that suggests that startups need to identify their most critical needs for growth so that the corporation can provide that in the program (Isabelle, 2013).

However, there are critical considerations for the GHTC when setting the objectives and expectations of the program. In theory, it is suggested that the objectives need to be long-term and that the high failure rate of startups need to be considered (Kupp et al., 2017). This is reinforced by the empirics, that also emphasize the different time perspectives regarding when profits are expected for a startup compared to a GHTC. To set long-term objectives and consider the high failure rate of startups are indicated to be challenging for the GHTC, because of the aspects depicted in theory related to the difficulty to measure and quantify ROI of a corporate-startup program and the risk aversion of large companies (Bannerjee et al., 2016; Thieme, 2017; Leifer et al., 2001).

5.3.2 Balance the Risk Profiles

Another aspect of balancing the terms, and ensure commitment from both parties, is to balance the risk profiles of the two parties in the corporate-startup program. Being involved in innovation activities imply uncertainties. Innovation is a complex process with large amounts of uncertainty involved, and the outcome of any innovation activity is hard to predict (Pavitt, 2006). Thus, the outcome of a startup-corporate program is uncertain and hard to predict as well, for both parties. However, due to the differences in nature, and the challenges the startup faces in its development phases, as presented in section 3.3 *Startup Characteristics* and specifically in Table 3.4: *Startup's growth phases and related challenges*, the risk for startups to join a corporate-startup program is indicated to be greater than for the GHTC, which is also emphasized by the empirics.

Additionally, the empirical data indicates that the risks in a corporate-startup program are higher for the startup than for the GHTC. It is suggested that the GHTC may risk losing prestige, employees, or a relatively small amount of money, whilst the startup may jeopardize the survival of the company. Thus, it is suggested that if both parties have a substantial amount of stake it is assured that both parties have

something to lose if the collaboration is unsuccessful. Hence, it is suggested to be safer for the startup to collaborate with the GHTC. If the stakes are not balanced it is likely that the attractiveness for the startup to join the corporate-startup program decreases, according to the empirical data.

However, as suggested in literature, if a company is opening up to innovate with external parties and engages in a corporate-startup program it will affect the risk profile of the established company (Bannerjee et al., 2016). Further, risks for companies engaging in open innovation activities are related to losing control as well as core competencies. This is related to the challenges for established companies to find a balance between the activities linked to open innovation and the activities linked to the *daily business*; the lack of financial resources and time, as well as being *too open* (Enkel et al., 2009).

Hence, it is of interest for the GHTC to realize both the risks of hosting a corporate-startup program and the risks for the startup and adjust the offering to balance the risk profiles.

Multiple perspectives in the empirical data emphasize an engagement in the form of a business partnership. From the perspective of the startups and the case organization, a business partnership is indicated to be a prerequisite for collaborating, emphasizing the importance of a clear business model where both parties have potential to benefit while balancing the risks. Suggested setups were collaboration on project or licensing the technologies and incorporate these in the solutions of the other party. Collaborating on projects is one of the highest prioritized elements in an offering according to two startups, as seen in Table 4.4: *The result from the prioritization from the interviewees*.

In summary, one critical factor in the offering of a corporate-startup program is that the terms are balanced. This means that both parties can gain real value and that the risk profiles are balanced. This enables benefits for both parties and attracts mature startups in the IoT-sector. Balanced terms are therefore considered a critical success factor. Specifically, business partnership, with a clear business model, is an engagement type that supports balanced terms.

5.4 Degree of Customization

From the empirical data and theory, it is evident that the degree of customization is a factor to consider in the offering of a corporate-startup program provided by a GHTC to mature startups in the IoT-sector. The degree of customization includes

the extent to which the offering should be tailored and adjusted to each startup participating in the program.

In the empirical findings, it is indicated by all perspectives that the program should be customized and tailor-made to each startup, due to the vast differences in needs, challenges and preferences among the individual startups. As a consequence, it is suggested that the GHTC needs to make sure that it understands the challenges and needs of each startup. This is in accordance with theory, that suggests that the program should be customized according to the needs of the participating startups (Kohler, 2016). However, the startup perspective in the empirical data indicates that even though highly customized programs are preferred, some structure may be valuable including elements such as frequent meetings with the GHTC, theme-based workshops and structured activities.

Further, it is evident from the perspective of the startups in the empirical findings that all startups have specific challenges, needs and characteristics related to the offering in a corporate-startup program. Therefore, the offering needs to be tailored to each startup in order to enable the startups to develop and grow. This is in line with theory, that suggests that the non-linear development of startups implies a need for a supportive program that is not a *one-size-fits-all* solution (Bergfeld, 2015). As indicated in Table 3.4: *Startup's growth phases and related challenges.* that mature startups are in greater need of customization, compared to startups in earlier stages, since early stage startups face challenges that tend to be mostly related to the business concept or idea and initial development of the product (Kazanjian & Drazin, 1990; Picken, 2017) In contrast, more mature startups face challenges that are more specific for each startup and require a unique and customized solution such as manufacturing (Kazanjian and Drazin, 1990). Further, it is indicated in the empirical findings, that the offering needs to be adjusted to enable the startup to help the GHTC to reach its objectives with the collaboration and achieve a beneficial outcome, e.g. because of the mentioned aspiration to achieve a win-win collaboration.

Furthermore, due to the different preferences regarding what should be offered in a program there is an obvious need to adjust the offering to each startup in order to satisfy each specific startup. In the empirical findings, the opinions regarding what elements that should be provided in the offering differ within and across all perspectives. Specifically, elements were the opinions are diverse to a high degree are customized product development of software, customized business development, customized development of support functions, and evaluations during the program. Further, the preferences regarding the format in which development and learning is provided to the startup (i.e. through expertise, joint development or outsourcing) differed across the interviewees. In theory, Table 3.7: *Elements suggested to be offered to startups*, it is evident that there is an extensive number of possible elements in a startup support program and no distinctive recommendation

regarding what should be offered based on the characteristics of mature startups and a GHTC.

Further, the time frame of the program and training are explicitly suggested to be customized to each startup and according to the objectives of the program. Further, office space is suggested to be optional and flexible. The need to customize the time frame depending on the characteristics of the startups is confirmed by literature (Kohler, 2016). It is further suggested that a more extensive time horizon gives more time to build relationships and thus a foundation for a more sustainable business (Kohler, 2016). Similarly, it is suggested in the empirics that the length of the program impacts the possibility for the startup and the GHTC to develop a deep relationship, close ties and an understanding of each other. Therefore, it is suggested in the empirics that some elements, that require a deep relationship, should not be offered in the program initially, e.g. access to the GHTC's customer base and co-development of technologies.

Moreover, one of the engagement types preferred by startups and the case organization is business partnerships, which require a high degree of customization. It is also indicated from the startup perspective that the collaboration would differ depending on the company it engages with, which can be argued to imply a desire for customization. This is reinforced by theory, that suggests that the partner that is chosen in a partnership of a *deep-tech* startup will be decided depending on the needs of the startup (de la Tour, 2017).

It is indicated in theory that large companies have structures and routines which are not beneficial in changing environments (Hill & Rothaermel, 2003). The rigidity in large companies is not beneficial for startups due to their rapidly changing environment, and thus the collaboration may backfire (Bonzom et al. 2016). Further, it is suggested that the degree of customization may impact the degree of bureaucracy associated with the collaboration (Kohler, 2016). According the empirical findings, the rules and activities of a corporate-startup program cannot slow the startups down. The importance of not slowing down or interfere with startups is evident in the empirical findings and mentioned as a prerequisite for collaborating. Hence, in order to not slow the startups down, the corporate-startup program needs to be customized in order to avoid that the GHTC transfers its rigidity and bureaucracy to the startup. Further, the GHTC is suggested in the empirical finding to learn from the startups way of working in order to reduce their inertia. This is mentioned as one of the main objectives for GHTC to engage with startups in Table 3.6: *Strategic corporate objectives for engaging with startups*. Thus, the program needs to be tailored to enable GHTCs to learn from the startups.

In summary, it is indicated from the empirical findings and literature that the offering of a corporate-startup program should be highly customized and adjusted according to each startup's challenges, needs and preferences, in order to attract and enabling them to develop and grow. Further, the program should be tailored to meet the objectives of the GHTC hosting the program. Therefore, if the offering of a corporate-startup program is highly customized to satisfy both parties, all aspects of a critical success factor are met.

5.5 Degree of Interference with the Competitive Edge of a Startup

From theory and the empirical data, it is evident that the degree of interference is a factor to consider in a corporate-startup program. It is indicated that it is important that the GHTC does not interfere too much with the aspects contributing to the competitive edge of the startup.

It is evident from theory that the differences in nature between a startup and an established company are vast, implying differences in e.g. agility, decision making processes, and rigidity (Berchicci & Tucci, 2008; Hill & Rothaermel, 2003; Mohr et al., 2010; Thieme, 2017). The aspects supporting these differences also contribute to the competitive advantages the startup and the established companies have toward each other (Kohler, 2016). Furthermore, these differences may imply difficulties when an established company and a startup are collaborating. Hence, it is important that the established company does not limit the startup to exploit their strongest capabilities but rather enhances them. Further, these capabilities of the startup can help inspire GHTCs and help them to radically innovate (Kohler, 2016), which are mentioned as objectives and benefits for the GHTC in the empirics.

According to theory, the competitive advantage of startups, toward established companies, is that they are fast and agile in their way of working, creative, and have the ability to radically innovate (Bannerjee et al., 2016; Chesbrough & Weiblen, 2015; Kohler, 2016). This is supported by the empirical data which emphasizes that the strengths of startups stem from the fact that they are small, fast and agile. Moreover, it is emphasized that GHTCs are not as agile, fast, and creative as startups are. Additionally, literature suggests that large corporations suffer from corporate inertia and high levels of bureaucracy (Hill & Rothaermel, 200). Therefore, it is vital that the GHTC does not transfer this to the startup during the corporate-startup program.

Further, as proposed in the empirical data, in order for the startup to keep their competitive edge during and after the program the offering needs to be tailored to not slow the startups down, reduce their creativity, or affect their ability to radically innovate. For example, it is mentioned as being essential that the creativity in the startups is not strangled by the structure of the program, as this will reduce the competitive edge of the startups. This is also beneficial for the GHTC, since the case organization emphasizes that GHTCs are not as agile and creative as startups are, and it is highlighted, in the empirics and theory Table 3.6: *Strategic corporate objectives for engaging with startups*, as a potential objective for the GHTC to learn from startups' way of working.

Additionally, in the empirical data, it is indicated that the GHTC should avoid steering the startup and thus adjust the program so that it enables the startups to work according to their preferences. It is suggested that the GHTC may set the frames for the engagement but should avoid interfering with the processes in the startup and fit the startups into the structure and processes of the GHTC. Additionally, if the GHTC interfere too much, there is a risk that the innovative capacity in the startup is reduced, according to the empirical findings. Further, to ensure the innovative capacity of the startup is beneficial for the GHTC as well. Startups can help the them to radically innovate, since it is a challenge for the GHTC to pursue radical innovations which are needed for long-term success (Blank, 2014; Chesbrough, 2014; Day, 2007; Hill & Rothaermel, 2003; Leifer et al., 2001; PwC, 2013).

Moreover, it is indicated in the empirical findings that the value a startup can gain from collaborating with the GHTC will depend on how fast the GHTC moves; and one of the prerequisite for a startup to join a corporate-startup program is that the startup is not slowed down by the program. Additionally, being slowed down is proposed as being a risk for a startup to engage with a GHTC. Thus, in order to offer an attractive program, the GHTC needs to ensure that the startups can keep their competitive edge.

Aspects that are essential to have in place in order to eschew reducing the competitive edge of startups, according to the empirics, are simplified business agreements, aligned objectives and expectations and inter-organizational alignment, and allocation of one or multiple internal champions.

The allocation of internal champions is an important component in the offering of a corporate-startup program in order to not reduce the competitive edge of the startups (Bannerjee et al., 2016; Kohler, 2016; Mocker et al., 2015). Internal champions should know the startups well; be able to navigate through the GHTC quickly; have decision making and budget power; and help the startup to find the resources and assets it needs (Bannerjee et al., 2016; Kohler, 2016; Mocker et al., 2015). This can

help to speed up processes (Bannerjee et al., 2016; Mocker et al., 2015). As proposed in the empirical findings, the allocation of internal champions will simplify processes and reduce the risk of slowing the startups down. The internal champions should be authorized to make decisions with a budget and help bridge the interactions between the two parties. Further, the allocation of internal champions will enable the startup to have fewer points of contacts with the GHTC and thereby enable deeper relationships between the two parties, which is suggested to ensure efficient interactions and a better understanding of the startups.

Moreover, there are several aspects that are suggested to affect how the GHTC interferes with the competitive edge of the startup through corporate-startup program. First, it is the physical location of startups. Being in the facilities of the GHTC may be linked to the GHTC's ways of working and rigid structure, which may affect the startup's way of working negatively, as suggested in the empirical data. According to theory, there is a rigidity and inflexibility in large organizations due to the stable environments in these organizations (Hill & Rothaermel, 2003); an environment where startups are unable to prosper. Secondly, access to the brand of GHTC may imply limitations to the startup related to rules and needs to ask for permission. This may be time-consuming, and thus slow the startups down, due to the long decision-making processes and bureaucracy in a GHTC (Hill & Rothaermel, 2003).

In summary, it is important that the corporate-startup program does not interfere with and reduce the competitive edge of the startup, but rather it should be tailored to enhance it, in order to leverage the potential benefits for both parties. If the startup will lose its competitive edge by engaging in the corporate-startup program, it will not be attractive for startups, nor enable them to grow. Additionally, it will also affect the GHTC negatively as it will not be able to harness the advantages of a startup. Therefore, ensure a low degree of interference with the startups' competitive edge is considered a critical success factor.

5.6 Focus of the Program

The focus of the offering of a corporate-startup program is, as acknowledged in the empirical findings and in theory, considered to be a factor in the offering of a corporate-startup program. Indicated in the empirical findings, the focus of offering should be two-fold. First, it should be focused around the unique selling point (USP) of the GHTC. This implies that the offering should be focused around elements that are related to the unique areas of expertise in the GHTC that cannot easily be accessed from other startup support institutions. Secondly, the focus should be focused around IoT-specific elements. This implies that the offering is related to the expertise and development within areas of IoT, i.e. expertise in IoT and high-

technology, support in hardware development and access to, or transfer of, technologies.

5.6.1 Focus the Program around the Unique Selling Point

The first aspect, regarding the focus of the offering, is the USP of the GHTC. In the empirical data, all perspectives indicate that providing elements that are focused around the uniqueness of the GHTC would increase the value of the offering. If the USP of the GHTC is in line with the needs of the startup, it is suggested that it would give the corporate-startup program a competitive edge toward other startup support institutions, attract startups, and enable the startups to access unique expertise which would help the startups develop. It is evident that a critical need for startups in the IoT-sector is to access expertise and support in specific areas. In the empirical findings, the startups mention finding human resources with the right skills as a main challenge and major need. This is reinforced in theory that suggests that the most critical barrier for scaleups to be able to grow, is to find employees with the right skills (ScaleUp Institute, 2017a) and one of the challenges for startups to grow as mentioned in Table 3.4: *Startup's growth phases and related challenges,* above. Further, providing elements related to the USP would imply that the GHTC can leverage their already existing internal capabilities, assets, and expertise.

When specific elements in an offering were assessed during the interviews, the interviewees tended to see a correlation between how valuable an element is and how related it is to the USP of the GHTC. For example, multiple perspectives highlight that mentoring and coaching are frequently provided by other startup support institutions and that these institutions are usually more skilled in providing these elements compared to a GHTC. However, if mentoring and coaching is related to the GHTC's specific areas of expertise, it can be valuable to provide. Furthermore, another example is the brand of the GHTC which is unique for each company. All perspectives mention several benefits for startups related to accessing the brand of the GHTC. It is suggested that the power of a brand varies depending on the specific company, and therefore, a powerful and well-known brand is an attractive USP.

However, it was also mentioned in the empirical data that an element can be valuable to provide even though it is not related to the USP of the GHTC, for example office space. Even though other elements, not related to the USP of the GHTC, may be valuable to startup, the focus of the program should not be related to these elements.

Further, it is evident from all perspectives in the empirical data, that functions in a GHTC that are managed and executed differently than in a startup, are not

considered to be valuable to provide support with from a GHTC. Thus, it is suggested that a GHTC should not apply corporate services to a startup. Examples of functions that are managed and executed differently in the two parties are customized business development, human resources, administration, accounting and security solution development. One reason behind is suggested to be the differences in prerequisites and mentality of a GHTC and a startup.

5.6.2 Focus the Program around IoT-Specific Support

The second aspect, regarding the focus of the offering in a corporate-startup program, is IoT-specific support. It is evident from all perspectives in the empirical findings that IoT-specific support is critical to provide, in order to enable mature startups in the IoT-sector to develop and grow. Emphasized elements are expertise in IoT and technology, hardware development, access to technologies and support with technological development. According to Hussain (2017) there are many challenges to tackle when developing an IoT solution, which reinforces the importance of providing IoT-specific support to startups within this sector.

IoT is challenging since it is a complex technological field (Hunter, 2015). In the empirical findings, multiple perspective indicates that there is a need for startups to access specific IoT- and technological expertise, further it is indicated that finding people with specific expertise related to IoT and technical areas are a challenge and weakness for startups. One examples of an element related to expertise in IoT is competent people that can do an in-depth analysis of the solution. In theory, challenges related to accessing competent people and functional specialists, are frequently mentioned in the later stages (Churchill & Lewis, 1983; Kazanjian & Drazin, 1990; Marmer et al., 2011; Picken, 2017). Hence, this tend to be particularly needed for mature startups, as compared to startups in earlier stages. Further, startups in the IoT-sector may have a need to discuss issues thoroughly due to the complexity of IoT. To accomplish this, it is indicated in the empirical data that it is important that the two parties have a deep understanding of each other.

However, even though the startups indicate the importance to access technological expertise, all startups mentioned that a strength is that they have their core technical competence in-house and a majority indicated that their technical competence is one of their strengths. This highlights the complexity of the IoT-field and the very specific expertise needed, since a need for support is evident even though it is described as a strength. Further, the core of the product, where the team has expertise, may be very specific, e.g. AI algorithms, and thus other technological solutions surrounding the core might require external expertise to be developed.

Moreover, as mentioned in theory, IoT-products typically include a hardware component as part of its solution, which is suggested to be time-consuming, and expensive and complex to produce (Graham, 2013; Hussain, 2017). In the empirical findings, these challenges were reinforced by all perspectives and it was indicated that collaborating with a GHTC could be a way to overcome these challenges. Multiple perspectives mentioned challenges due to e.g. high costs of production, long productions cycles and difficulties to change the product once it is produced. Further, support with product development is indicated to be a valuable element in an offering of a corporate-startup program. Customized product development is the third most frequently prioritized element, as shown in Table 4.4: *The result from the prioritization from the interviewees*. Multiple perspectives highlighted that the experience and knowledge of a GHTC in product development may attract startups and that specifically hardware development would be valuable to offer to startups in the IoT-sector, including setting up the value chain, production, hardware design, and prototyping. As one expert mentioned, a GHTC would be a *great partner* in hardware.

Furthermore, to access the technologies of the GHTC or integrating the startup's and the GHTC's technologies, are mentioned by all perspectives in the empirical findings as beneficial elements to offer. Further, technological transfer was the second most frequently prioritized element, as shown in Table 4.4: *The result from the prioritization from the interviewees*. The case organization perspective was positive toward offering technologies, including offering access to IPs of the GHTC, and this was reinforced by the expert perspective. It is suggested by multiple perspective that technology transfer allows startups to leverage the GHTC's platforms, which may imply benefits for both the startup and the GHTC. In theory, it is suggested that one objective of companies when engaging with startups is creating an ecosystem around the company's platforms (Bonzom & Netessine, 2016; Chesbrough & Weiblen, 2015; Kohler, 2016). Further, to integrate and transfer technologies between two independent organizations can be compared to a *technology alliance* (Faems, 2018). Moreover, enabling startups to use and leverage IPs and ideas of the GHTC, will enhance the open innovation approach that the corporate-startup program implies (Chesbrough, 2003a).

However, challenges related to integrating technologies, and co-develop, are mentioned by all perspectives in the empirical data. Mentioned challenges are legal risks and risks of becoming too intertwined. Instead, there are suggestions to transfer technologies but not develop together and having ownership separate for as long as possible. Hence, even though integrating technologies from each other, the GHTC and the startup need to be aware of the risks that it may imply.

In summary, the offering of the corporate-startup program should be focused around both the USP of the GHTC and IoT-specific support. Focusing the offering around

these areas is important in order to create a competitive edge for the corporate-startup program, attract mature startups in the IoT-sector, offer expertise and assets which can enable these startups to develop and grow, and enable the GHTC to leverage their internal capabilities. Hence, this is considered to be a critical success factor.

5.7 Build Legitimacy and Credibility

The importance of legitimacy and credibility for the growth and survival of a startup is acknowledged in both the empirical findings and in current literature. Hence, it is critical factor in the offering of a corporate-startup program to enhance the legitimacy and credibility of the startup. Further it is indicated in both theory and empirics that the GHTC can help the startup to build legitimacy and credibility through a corporate-startup program in different ways, however, there are also related challenges.

As described in literature, legitimacy is a critical resource for startups and the actions taken to enhance legitimacy are directly related to its survival and the startups ability to manage stakeholders, access markets, and innovate (Ricard, 2017). Furthermore, Picken (2017) suggests that one of the challenges of startups in the phase the author calls *transition phase,* is for the startup to establish credibility and legitimacy, indicating that the startup needs these in order to enable scaling. Further, startups need legitimacy and credibility as these suffer from the *liability of newness* stemming partly from the lack of these and their non-existing track record (Ricard, 2017). The empirical data suggests that a startup could gain legitimacy and power from collaborating with a GHTC and thereby compensate for their *liability of newness* and *liability of smallness*, i.e. that a startup does not have the power to drive the market forward and the startup is not yet seen as a legitimate actor by other actors in the ecosystem, as described by an expert.

Many benefits related to enhanced legitimacy and credibility are mentioned both in theory and in the empirical data. First, it is suggested in the empirical data that legitimacy can be used to attract talented employees, acquire new customers, and raise investor capital. According to the empirical data, investors are strongly influenced by signals and beliefs, and if the startup has legitimacy and credibility the startup will be more attractive to investors and more likely to have a higher valuation. In theory, enhanced credibility is suggested to help startups to raise investor capital, attract talent, and attract future partners (Kohler, 2016). These are all critical resources that startups need in order to grow, as seen in Table 3.4: *Startup's growth phases and related challenges*, which is further supported by the

empirical data as these are mentioned as challenges and weaknesses for mature startups in the IoT-sector.

Startups can gain legitimacy and credibility through a corporate-startup program hosted by an established company. Several elements in the offering of the program are proposed by theory and the empirics to enable increased legitimacy and credibility.

First, in literature it is suggested that one element that can be offered is an endorsement (*a favorable opinion given by one organization to another*) from the established company, as the legitimacy from the endorsing organization will spill over to the startup (Zimmerman & Zeitz, 2002). It is suggested in the empirical findings that one way of offering an endorsement is first to start collaborating with the startup, and then allowing the startup to communicate the collaboration to external parties. It is further emphasized in the empirical data that a collaboration with a well-known and established brand will help the startup to open doors.

Secondly, in literature it is suggested that one element that can be offered to increase the legitimacy is access to networks, i.e. enabling connections with different organizations, individuals and associations (Zimmerman & Zeitz, 2002). First, the GHTC can offer the startup to access individuals within the GHTC but also to enable the startup to engage with actors in the ecosystem of the GHTC and connect with external parties. This will enable the startup to *piggyback* on the legitimacy of the GHTC as well as the legitimacy of other access that the startup can access (Zimmerman & Zeitz, 2002). This is reinforced by the empirics, that mentions that legitimacy and power is gained by piggybacking on big brands and communicate the engagement.

Thirdly, it is suggested in the empirical findings that one element in the offering that will help the startup to gain credibility is access to the brand of the GHTC. Access to the brand of the GHTC is suggested by one expert to be the most critical element in the offering and mentioned in theory as an important benefit (Becker & Gassmann, 2006b; Mocker et al., 2015). Additionally, it is suggested by the case organization in the empirics that the brand of the GHTC will imply a quality stamp and from the startup perspective, a well-known brand would be one of the reasons for startups to choose a corporate-startup program. Access to brand can be offered in different ways. First, as discussed above it can be the communication of the participation in the corporate-startup program. Another way to offer access to the brand is by allowing the startup to us the brand of the GHTC to brand or co-brand their products.

However, it is emphasized in the empirical data that providing access to the brand may imply complications and risks for both parties. First, it is hard for the GHTC to ensure that the startup uses the brand according to the company's rules and regulations. The rules large companies have regarding how their brand is used, will limit what the startup can do especially since a startup's way of doing business typically interferes with the demands of the large company and the startup will have to ask for permission.

Moreover, the case organization did not raise that communicating an engagement with a GHTC would imply any problem, it was rather emphasized as something positive. If it is communicated that the GHTC is collaborating with startups it might help the GHTC to strengthen their brand and attract talent, which are mentioned in the empirics and theory, Table 3.6: *Strategic corporate objectives for engaging with startups*, as potential objectives with hosting a corporate-startup program.

Fourthly, one alternative for the GHTC to help the startup gain credibility is by offering to be a customer of the startup, i.e. purchasing, licensing, or integrating the startup's solution. Having a large customer with a strong and well-known brand can help a startup to gain credibility as indicated in the empirical data.

In summary, a critical component in a corporate-startup program is to enable the startup to gain credibility and enhance its legitimacy, as these are vital for the survival and growth of the startup. Legitimacy can be offered by endorsing the startup or giving the startup access to a network of actors with high legitimacy. Credibility can be offered by allowing the startup to use the brand of the GHTC or by being the customer of the startup. Further, the GHTC can gain value enabling the startup to communicate the collaboration externally as it may strengthen the brand of the company and attract talent.

5.8 Learning Opportunities

The fact that it is critical for startups and GHTCs to learn is evident from both theory and the empirical findings. Therefore, learning opportunities is a factor to consider in a corporate-startup program. According to (Mocker et al., 2015) it is important to prepare the set-up of a corporates-startup program that enables both parties to complement each other, and to design the offering thereafter. Providing learning opportunities is one way of achieving this.

As shown in Table 3.4: *Startup's growth phases and related challenges*, one of the main challenges for startups in mature phases, according to multiple scholars, is to

access and hire competent and experienced people as well as managers (Churchill & Lewis, 1983; Kazanjian & Drazin, 1990; Marmer et al., 2011; Picken, 2017). This is further emphasized by the ScaleUp Institute (2017) claiming that one critical aspect in order for the startup to grow is to access talented people with the right skills. Additionally, lack of experience or competence is suggested by Picken (2017) to be one of the primary reasons to startup failure. Furthermore, in the empirical data it is suggested that if startups are not learning continuously, the probability of failure is high. Hence, one important factor in a corporate-startup program is to enable startups to gain new and relevant knowledge.

Furthermore, it is indicated in the empirical findings and theory that the GHTC can learn from the startups as well. One widely emphasized benefit for GHTCs to engage with startups, is to be inspired and learn from their way of working. In theory, as shown in Table 3.6: *Strategic corporate objectives for engaging with startups,* the GHTC may be able to learn from the startup in order to rejuvenate the corporate culture, improve ways of working, and gain strategic insights. Further, the GHTC can increase its absorptive capacity by learning from startups. Lack of absorptive capacity is described as a reason why incumbent companies struggle to respond to radical changes (Hill & Rothaermel, 2003). The absorptive capacity can be increased by having knowledge about a new technology, and it is important to increase absorptive capacity early when a new field emerges, to not be locked out in the future (Cohen & Levinthal, 1990; Davenport et al., 2003). Therefore, GHTC can benefit by learning from innovative startups in the IoT-sector, as this is a new and emergent field of technology.

It is evident from the empirics that it is valuable for startups to meet with employees in the GHTC and learn from them directly. It is emphasized that it is more important to learn from the employees than receiving help from the GHTC in the form of outsourcing. The empirical findings indicate that knowledge will provide more long-term value for the startup which is suggested to be more important than *quick-fixes*. It is especially highlighted that it is more valuable for a startup to learn in areas related to their core business. Thus, the setup of the program is suggested to be designed to enable knowledge exchange between the two parties.

Additionally, the empirical findings suggest that it would be valuable to have an internal advisor from a GHTC to whom the startup can ask all their questions and discuss different challenges. Moreover, it is emphasized from the empirical data that it could be valuable for both parties to work together, since it allows the parties to learn from each other.

Further, it is indicated in the empirical data that startups always have to learn and develop by surrounding themselves with experts. Sharing office space is thus suggested as an element in the offering that would enable this, as this would enable

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the startup to be physically surrounded by experts and enable easy access to these. Further, it is suggested to be valuable to offer access to experts in the GHTC who can give advice and contribute knowledge within broader categories including technologies, markets, services and operations, and legal issues. Furthermore, the value of getting access to employees in the organization to discuss and help validate the startup's idea is highlighted. Further, it is emphasized by the startup perspective that it would be valuable to learn from the GHTC how they talk about technology with non-technical people in order to help these people gain understanding for the product. The ability to supply knowledge to the startups, through feedback, advice and expertise, was confirmed to be a viable option from the perspective of the case organization. Additionally, if the GHTC were to engage with multiple startups simultaneously, it would be valuable from the startup perspective, to learn from the other startups as well.

In summary, one factor that is critical in the offering of a corporate-startup program is to enable the startup to learn by providing knowledge and expertise. To provide learning ensure startup survival and enable their development, which in turn may increase the attractiveness of the program. Further, to enable GHTC to learn from the startups it is engaging with, will imply benefits for the company and help it to reach its objectives. Therefore, to enable learning opportunities is considered a critical success factor in a corporate-startup program.

5.9 Set the Startup in a Context

The importance for startups to be set in a business context is evident in both theory and the empirics. To be set in a business context includes setting up a value chain as well as access to a network of other actors in order to build an ecosystem around the startup. In order to achieve this, a GHTC can help startups to set up a value chain and build a network. In theory, it is suggested that a large and committed external network, and domain knowledge about the various aspects of setting up and growing a business, should be provided in a corporate-startup program (Kupp et al., 2017). Further, access to high-quality infrastructure is mentioned as one barrier for startups in order to grow, that a corporate-startup program can enable (ScaleUp Institute, 2017a).

5.9.1 Hardware Value Chain Support

To offer support to set up or refine the value chain, is emphasized by all perspectives in the empirical data to be valuable for startups. Specifically, the startup perspective mentioned getting the production of hardware up and running at good quality as a challenge, and it was suggested that advice for how to set up sales channels, production and delivering are valuable elements to provide. Further, the high value

of providing this kind of support is stressed in the empirical data. The case organization representative highlighted that a GHTC should offer support regarding the practicalities of the different parts in the startup's value chain, by enabling the startup to access experience, contacts, and brand power of the GHTC. The expert perspective indicated that *industrialization knowledge* should be offered, which includes access to suppliers, manufacturers and production sites, as well as knowledge about how to interact with them.

In theory, it is evident that to set up a value chain is critical for mature startups in the IoT-sector. There are challenges for startups related to leveraging processes, manufacturing and distribution in the startup growth phases (Churchill & Lewis, 1983; Kazanjian & Drazin, 1990; Picken, 2017). Further, theory emphasizes that for a startup to integrate with the supply chain of the GHTC is one of the main reasons for startups to engage with an established company (ScaleUp Institute, 2017a). Furthermore, since a product or service based on IoT technology typically includes a hardware component, the development- and production process are more complex and expensive, compared to software (Graham, 2013; Hussain, 2017). Thus, the need for startups in the IoT-sector to set up a value chain is essential, and support to enabling a startup to achieve this is indicated to be of high value.

5.9.2 Access to Networks

Another aspect enabling startups to build a business context, is providing access to a network, as it is evident in the empirical findings and in theory this is a valuable element to offer in a corporate-startup program. In the empirical findings, all interviewees that commented on *providing access to networks* are positive toward providing it. Further, it was highlighted that it would be valuable for the startup to tap into the network of the GHTC. From the startup perspective, it was widely emphasized that accessing the connections of the GHTC would be beneficial for them. It was suggested that this would enable them to access, and get introductions to, e.g. potential customers, connections to do projects with, people to have on their advisory board and internal employees at the GHTC. In theory, it is suggested that startups do not have established networks with stakeholders (Hill & Rothaermel, 2003). Further, it is suggested that it is viable and preferable for established companies to provide networks to startups (Mocker et al., 2015).

Furthermore, multiple perspectives in the empirical data indicated that the GHTC should support startups to build networks, by setting up contacts with customers, business contacts, potential investors, and partners of the GHTC. Furthermore, network to other startups participating in the corporate-startup program simultaneously is mentioned as valuable.

From the perspective of the GHTC, providing access to networks enable them to leverage their existing network to create an attractive program and strengthen the brand of the GHTC. Strengthen the brand is mentioned in the empirical data as corporate objectives of hosting a corporate-startup program.

In summary, it is important to offer support to set up a value chain and access to networks, in order to attract mature startups in the IoT-sector and enable them to grow. Support related to the value chain is suggested to be an element where a GHTC has valuable experiences, expertise, and capabilities that can be provided to a startup. Further, to tap into the ecosystem of the GHTC will allow startups to access sales opportunities, expertise and potential partners. Therefore, it is considered a critical success factor in an offering of a corporate-startup program.

5.10 Reach the Market

It is critical in a corporate-startup program to enable startups to reach their markets and target customers, which has become evident in theory and the empirical findings. In order to reach markets and target customers, two critical aspects have been discussed in the empirical findings and these are: (1) knowledge about markets and target customers and (2) channels to reach them. In the empirical findings, it is evident that market access is a critical element in the offering of a corporate-startup program. Market access is most frequently mentioned as a top prioritized element, as shown in Table 4.4: *The result from the prioritization from the interviewees*.

5.10.1 Knowledge about Target Customers

In the empirical findings, the need for knowledge about target customers, in order to be able to reach them, is evident. From the startup perspectives, related challenges and needs for customer- and market knowledge are mentioned. For example, to learn from the GHTC's experiences with the target customers and to learn the ability to explain the technology to people that are not familiar with it, are mentioned as valuable. Further, one startup mentioned market research and help to validate a market as a top prioritized element to be offered, as seen in Table 4.4: *The result from the prioritization from the interviewees*. The need for customer- and market knowledge is reinforced by the expert perspective, who mentioned that it will enable startups to understand how to reach the market and identify customer value. In theory, it is indicated that the most common reason why startups fail is that there is no market need for the solution (CB Insights, 2018). Hence, startups tend to need more knowledge of markets and customers in order to ensure a product-market fit. Further, established companies are suggested to be able to provide market knowledge and experience (Mocker et al., 2015).

It is indicated in the empirical findings that it is difficult to reach customers. The reason mentioned is related to the challenges of being the first player on the market. Since the solution for many of the startups interviewed, is completely new to the market and their target group and thereby, future potential customers will find it hard to understand, or will not look for, the solution. IoT is a rapidly emerging field and there is an ongoing evolution of technologies surrounding IoT (OECD, 2016). Therefore, the challenges of being the first player on the market are reasonably common and critical. Further, it implies that experience of, and knowledge about, IoT-customers and how to reach these markets are probably scarce and therefore, valuable for GHTCs to provide to startups if possible, which relates to the USP of the GHTC, discussed in section 5.6.1 *Focus the Program around the Unique Selling Point*.

5.10.2 Channels to Reach the Market

The second aspect for accessing the market, is to provide channels. In the empirics, all perspectives highlighted that a channel to reach customers is a valuable element to provide and several different strategies to access the market and the customers are mentioned. In theory, it is indicated that the opportunity to connect with large customers and integrate with the supply chain of the company are main reasons why startups collaborate with established companies (ScaleUp Institute, 2017a). Further, it is suggested in theory that large companies have market power protected by entry barriers, which makes them a more powerful player on the market compared to a startup (Hill & Rothaermel, 2003).

In theory, it is indicated that access customers in different markets is one barrier in order to scale up and there are several challenges related to acquisition of customers, marketing and sales in the growth phases of startups (Churchill & Lewis, 1983; Kazanjian & Drazin, 1990; Marmer et al., 2011; ScaleUp Institute, 2017a). This was reinforced by the empirics, since it is evident from all perspectives that access to markets, customers and sales channels are critical in order for startups to develop and grow. Mentioned reasons for this, as depicted by startups, are e.g. related to be the first player on the market and have a physical product. Hence, IoT-startups tend to have particular needs to reach the market. Another mentioned reason is regulatory constraints. Furthermore, marketing support is mentioned as a valuable element to provide by multiple perspectives. Further, it was emphasized in the empirical findings that in order for the GTHC to offer access to markets there need to be a good fit between the target customer of the GHTC and the startup.

Providing sales channels to startups, can be beneficial for the GHTC as well and enable it to reach its objectives. In the empirical findings, it is mentioned by the case

organization that giving the startups market access may imply that the GHTC can expand their current business and accessing external innovations and complementary products. In literature, Table 3.6: *Strategic corporate objectives for engaging with startups*, mentioned corporate objectives with a corporate-startup program are e.g. expansion into new markets, accessing external innovations and creating an ecosystem around the company's platforms.

In the empirical findings, three main strategies to reach the markets are mentioned. These are (1) to give access to the GHTC's distribution channels by selling the startup's product under the brand of the GHTC, the startup's brand or co-brand the product, or bundle products from both parties; (2) let the startups meet the GHTC's customers by e.g. making introductions, giving recommendations, inviting startups to meetings with customers and allow startups to have workshops or events with customers; (3) the GHTC becomes the customer of the startup by buying the solution from the startup or license their technology. All strategies are suggested to imply high value for the startup, and also for the GHTC. However, there are challenges mentioned for all strategies. In theory, the mentioned strategies to reach the market are through gaining the GHTC as a customer and by accessing their distribution channels (Kohler, 2016; Mocker et al., 2015).

Examples of challenges related to providing distribution channels, mentioned in the empirics, are that the startup scales too fast if it gets access to the large number of customers that the GHTC has and that using the GHTC's brand is closely related to several limitations for the startups. The case organization is positive toward providing available sales channels to the startups, however, one suggestion is that the startup's product need to be appropriate for the GHTC's sales channels and it needs to be beneficial for both parties. Mentioned challenges related to be the customer of the startup are e.g. that the GHTC put too high demands on the startup as a supplier and the startup may become too reliant on one customer. Further, it is suggested that a certain level of depth in the relationship between the GHTC and the startup is required in order to co-develop technologies, according to the case organization, and access to the customer base of the GHTC, according to the startups.

In summary, it is critical for mature startups in the IoT-sector to get support in order to reach their markets and thereby develop and grow. Therefore, offering knowledge about the target customers and support to reach the market are highly attractive elements for startups in the IoT-sector in a corporate-startup program. If the GHTC offers market access it may also help the GHTC to expand their portfolio and expand into new markets. However, strategies to reach the market may also imply challenges for both parties. Due to the attractiveness and benefits for both parties in providing the startups with support to reach the markets is considered a critical success factor.

6 Conclusions and Final Remarks

This chapter presents the conclusions of this master thesis, including the critical success factors for a corporate-startup program for mature startups in the IoT-sector hosted by a global high-technology company, together with contributions to theory and practice. Moreover, suggestions to further research are presented.

In this master thesis, critical success factors in the offering of a corporate-startup program hosted by a global high-technology company to mature startups in the IoT-sector, have been studied and identified. The answer to the research question, contributions to theory and practice, as well as suggestions for future research are presented below.

6.1 Answer to the Research Question and Contributions to Theory and Practice

The research question of this study is:

> *Which are the critical success factors in the offering of a corporate-startup program for mature startups within the Internet of Things-sector hosted by a global high-technology company?*

To answer this research question, ten critical success factors in the offering of a corporate-startup program for mature startups in the IoT sector hosted by a GHTC were identified in this study. These critical success factors are: (1) to provide an initiation process that is simple and in which expectations and objectives are aligned; (2) to align intentions and consequences of providing financial support; (3) to balance the terms of the program; (4) to provide a high degree of customization; (5) to ensure a low the degree of interference with the competitive edge of the startup; (6) to focus the program around the unique selling point of the GHTC and IoT-specific support; (7) to support the startup to gain legitimacy and credibility; (8) to provide learning opportunities; (9) to provide a business context; and (10) to provide access to IoT markets. These are further described in section 6.1.1 *The Critical Success Factors* below.

The critical success factors are based upon three aspects that the offering of a corporate-startup program should include. These aspects are: (1) the program should attract mature startups in the IoT-sector, (2) the program should allow the startups to develop and grow, and (3) the program should enable the GHTC to achieve a beneficial outcome.

The main contribution to theory are the ten proposed critical success factors in a corporate-startup program, specifically focused on collaborations between mature startups in the IoT-sector and GHTCs. No previous study has investigated startups in the IoT-sector with similar criteria as used in this study in a corporate-startup program. Further, the findings of the study extend current research regarding corporate-startup engagements by acknowledging its applicability for mature startups in the IoT-sector and GHTCs.

Furthermore, the intention is that this study will have practical implications and that the results can be used to give guidance to GHTCs aiming to refine a currently running corporate-startup program for mature startups in the IoT-sector or to launch a new such program.

6.1.1 The Critical Success Factors

The ten proposed critical success factors in a corporate-startup program for mature startups in the IoT-sector hosted by a GHTC are presented below together with additional contributions to theory.

Provide an initiation process that is simple and in which expectations and objectives are aligned

It is critical that the initiation process is time- and cost efficient for the startup. Further, it is critical that the process includes alignment of objectives and expectations from both parties, constituting the foundation of the corporate-startup program. This finding supports current theory regarding the importance of simplifying agreements; addressing legal issues; and aligning the expectations and objectives from the beginning of a corporate-startup engagement. Further, it supports the importance of not slowing the startup down.

Align intentions and consequences of providing financial support

It is critical to consider the consequences of providing financial support in a corporate-startup program and to align the consequences with the intentions of the

two parties. This finding supports current theory regarding the importance for startups to access financial support and ensure aligned expectations in a corporate-startup engagement.

Balance the terms of the program

It is critical that the terms of the corporate-startup program are balanced and constructed to enable increased value for both parties and balanced risk profiles in order to ensure full commitment from both parties. Further, the terms should enable both parties to meet their objectives. This finding supports current theory regarding the importance of ensuring real value for both parties, achieved by establishing clear objectives for both parties and using an internal champion in a corporate-startup engagement. Further, this finding contributes to current theory by indicating the importance of balancing the risk profiles of both parties for collaborations between a GHTC and mature startups in the IoT-sector.

Provide a high degree of customization

It is critical that the corporate-startup program is highly customized to each startup and its challenges, needs, and preferences. This finding supports current theory regarding the importance of customization and to not slow the startup down in a corporate-startup engagement. Further, this finding contributes to current theory by indicating the importance of adjusting the provided elements according to the length of the program and the depth of relationship for collaborations between a GHTC and mature startups in the IoT-sector.

Ensure a low degree of interference with the competitive edge of the startup

It is critical that the corporate-startup program does not interfere with any of the factors that contributes to the competitive edge of the startup. Hence, the program should not interfere with, or reduce, the startup's agility, speed, creativity, or ability to radically innovate. This finding supports current theory regarding the importance for startups to be agile, fast, creative, and radically innovate. It also supports the importance of customizing the program and the use of an internal champion in a corporate-startup engagement. Further, this finding contributes to current theory by indicating the importance for the hosting company to avoid steering the startup in collaborations between a GHTC and mature startups in the IoT-sector.

Focus the program around the unique selling point of the GHTC and IoT-specific support

It is critical to focus the corporate-startup program around IoT-specific support and the unique selling point of the GHTC, i.e. elements that are related to the areas of expertise in the GHTC and that cannot easily be accessed from other startup support

institutions. This finding supports current theory regarding the complexity and the difficulties of developing an IoT solution; the need for competent people; and the value of accessing and transferring technologies in a corporate-startup engagement. Further, this finding contributes to current theory by indicating the importance for the hosting company to focus the offering around its USP for collaborations between a GHTC and mature startups in the IoT-sector.

Support the startup to gain legitimacy and credibility

It is critical that the startup is able to build credibility and legitimacy during the corporate-startup program, and that the program is tailored accordingly. This finding supports current theory regarding the importance for startups to access networks and getting endorsed by a legitimate actor in order to build legitimacy.

Provide learning opportunities

It is critical to enable knowledge exchange and for the startup to build expertise during a corporate-startup program to gain sustainable value. This finding supports current theory regarding the importance for startups to access expertise and for the hosting company to learn from the startup.

Provide a business context

It is critical to provide a business context to a startup in a corporate-startup program, including support to set up a value chain and access to networks. This finding supports current theory regarding the importance for startups to gain knowledge about the aspects of setting up a value chain and build a network in a corporate-startup engagement.

Provide access to IoT markets

It is critical that mature startups in the IoT-sector are enabled to gain knowledge about their target customers and receive support to access the market through a corporate-startup program. This finding supports current theory regarding the importance of providing relevant market knowledge; and channels and opportunities to access the market in a corporate-startup engagement. It also supports the value for the hosting company to harness a startup's product or service to enhance its current business. Further, this finding contributes to current theory by indicating the importance of knowledge about target customers in order for IoT-startups to reach their customers, due to the newness and complexity of the field of IoT.

6.2 Suggestions for Future Research

As current scientific theory is scarce related to corporate-startup engagements in general and especially related to mature startups in the IoT-sector, the need for future research is vast, both related to extending the implications of this study as well as exploring related topics. Further, as this study was of exploratory character, aspects that have been indicated can be studied further in depth in future research.

First, future research is suggested to further validate the results presented in this study. This can be done with complementary in-depth interviews that can be conducted with mature startups in the IoT-sector, subject matter experts with additional experience and knowledge with regards to what the experts in this study have, and other GHTCs. Further, the results can be tested using complementary methods, e.g. structured interviews or surveys.

Secondly, future research is suggested to focus on complementing the results of this study, i.e. research aiming to complement the list of critical success factors presented in this study and make it more exhaustive.

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Appendix A Description of the Case Organization

The case organization is representing the perspective of the global high-technology company hosting a corporate-startup program in this study. The case organization is a global company with more than 100 000 employees worldwide. The company is active within multiple sectors within electronics and entertainment, with an extensive focus on developing high-technology solutions and platforms. The company has a department focusing specifically on IoT solutions. The case organization is actively working with R&D and has an aim to extend the focus of their business beyond the existing core business.

Appendix B Interview Guides and the List of Elements

In this section, the interview guides for interviews with startups, the case organization and the subject matter experts are presented. Further, the list with elements to offer in a corporate-startup program, used during the interviews, is presented.

B.1 Interview Guides

Before all interviews, the following introduction was completed.

- Introduction of ourselves and our project
- Inform why this person has been chosen as interviewee
- Ensure the interviewee that there are no right or wrong answers. We are interested in personal experience and opinions
- Inform about the format of the interview
- Ask if we can audio record the interview and explain why this is done
- Give assurance that the person will be anonymous in the written report, response treated with confidentiality

B.1.1 Interview Guide for Interviews with Startups

Opening Questions

1. **Please describe your company and its main objective briefly**
   Probes: mission/purpose, vision/growth plan, products/services, target market, when the company was founded, team, revenue

2. **What is your role in the company?**
   Probes: title, responsibilities, full-time/part-time employee

Key Questions

The startup's current state: competences, obstacles and needs

3. **What do you consider as being your company's main strengths and weaknesses?**
   Probes: competences, experience, resources

4. **Currently, what are the main challenges for your (the company's) development and scaling?**
   Probes: why

5. **What are your (the company's) major needs right now and what would help you most to develop and scale up?**
   Probes: why

Why the startup would engage with a global high-technology company

6. **In your opinion, do you believe that engaging with a global high-technology company would enable you to fulfill your needs and/or overcoming your challenges?**
   Probes: how, why is that

7. **What are the most valuable assets, resources, services, and/or activities that you believe a global high-technology company could contribute with at your current stage?**
   Probes: what kind (more detailed description of resource/service/activities), what format (execution), what implications could that have for your company today, why do you believe this is relevant

8. **Based on this list and what you have previously mentioned, which are the five most relevant elements (assets/resources/services/activities) that a global high technology company can contribute with to you at your current stage?**
   Prompt: list of possible offerings

Probes: what kind (more detailed description of resource/service/activities), what format (execution), what implications could that have for your company today, why do you believe this is relevant

9. **Is there any kind of offering or aspect of an engagement with a global high-technology company that would be a "make it or break it" for you in your consideration of participating?**
   Probe: why is that

10. **From your perspective, do you see any risks engaging with a global high-technology company?**
    Probes: hinder growth, why is that

Closing Questions

11. **Is there anything you would like to add or anything you think that we have forgotten to ask you about?**

12. **Can we contact you if we have further questions or need any clarifications?**

13. **Whom else should we talk to?**
    Probe: introduction, contact details

B.1.2 Interview Guide for Interviews with Case Organization Representatives

Opening Questions

1. **What is your official role in the company?**
   Probes: responsibilities

2. **What kind of involvement have you had with the initiative to open up for collaboration with external startups this far?**
   Probes: responsibilities, time horizon

3. **What will your future role be in the initiative?**
   Probes: responsibilities

Key Questions

4. **In your opinion, why is the company establishing a corporate-startup program?**
   Probes: what to achieve with this initiative, impact on the brand, contribution to an entrepreneurial culture, enhancement of innovation, creating an ecosystem around the company's platforms, solving business problems, expansion into new markets, attract talent

5. **How do you think engaging with startups will contribute to what you mentioned in the previous question?**
   Probes: how can this be achieved in practice

6. **Do you see any risks engaging with startups?**
   Probes: from the perspective of the company, how can these risks be overcome

7. **In your opinion, what assets, resources, services and/or activities should be provided by a global high-technology company hosting a corporate-startup program in order attract the right startups?**
   Probes: what kind (more detailed description of resource/service/activities), what format (execution), why do you believe this is relevant for startups, why do you believe this is relevant for a global high-technology company to provide

8. **Based on this list and what you have previously mentioned, which are the five most relevant elements (assets/resources/services/activities) that a global high-technology company should provide to startups in a corporate-startup program?**
   Probes: what kind (more detailed description of resource/service/activities), what format (execution), why do you believe this is relevant for startups, why do you believe this is relevant for the global high-technology company to provide, how do you believe it align with the company's objectives (previously discussed)

9. **Are there any other factors, besides the actual offering, that you believe would attract startups to participate in a corporate-startup program?**

Probes: brand, validation, credibility

Closing Questions

10. **Is there anything you would like to add or anything you think that we have forgotten to ask you about?**

11. **Can we contact you if we have further questions or need any clarifications?**

12. **Whom else should we talk to?**
    Probe: introduction, contact details

B.1.3 Interview Guide for Interviews with Subject Matter Experts

Opening questions

1. **What is your professional role?**

2. **What makes you an expert in the area of corporate-startup engagements?**
   Probes: previous experience: worked with startups before, former entrepreneur, worked with other corporates with their corporate-startup engagement

Key Questions

3. **In your opinion, should an established global high-technology company engage with mature startups in the IoT-sector?**
   Probe: why, benefits (company objectives), risks

4. **In your opinion, should mature startups in the IoT-sector engage with established global high-technology companies?**
   Probe: why, benefits (fulfill what needs, overcome what challenges), risks

5. **In your opinion, what assets, resources, services and/or activities should be provided by a global high technology company to startups**

in an Engagement Program in order to align the objectives of the incumbent company with the needs and challenges of the startups?

Probes: what   kind   (more   detailed   description   of assets/resource/service/activities), what format (execution), why do you believe this is relevant for startups, why do you believe this is relevant for global high-technology companies to provide

6. **Based on this list and what you have previously mentioned, which are the five most relevant elements (assets/resources/services/activities) that the incumbent company should provide to startups in a corporate-startup program?**

   Probes: what   kind   (more   detailed   description   of resource/service/activities), what format (execution), why do you believe this is relevant for startups, why do you believe this is relevant for global high-technology companies to provide, how do you believe it align a company's objectives

Closing Questions

7. **Is there anything you would like to add or anything you think that we have forgotten to ask you about?**

8. **Can we contact you if we have further questions or need any clarifications?**

9. **Whom else should we talk to?**
   Probe: introduction, contact details

B.2 The List of Elements

The list of resources, services and activities are presented in Figure B.1 below.

Access to company-specific resources: Development of core business
1. **Customized product development**
    - Development of hardware
    - Development of software
    - Security solution development
    - Other customized product development
2. **Customized business development**
    - Development of business model/plan
    - Development of marketing plan
    - Development of management team and management skills
    - Development of business skills
    - Other customized business development

Access to company-specific resources: Development of support functions
3. **Customized development of support functions**
    - Technology assistance
    - Marketing
    - IP lawyers
    - Legal
    - Administration
    - Accounting
    - HR
    - Other support functions

Access to tangible assets
4. **Technology transfer**
    - Use of incumbent company's platforms
    - Use of incumbent company's products
    - Other technologies
5. **Office space**
    - Degree of access: e.g. war room, full time
    - Office space design
    - Co-working space

Development of sales
6. **Market access**
    - Access to incumbent company's distribution channels
    - Incumbent company as first customer
    - Other type of market access

Funding
7. **Financial support from incumbent company**
8. **Help to rise funding from investors**

Access to people
9. **Mentoring and Coaching**
    - External experts
    - Internal experts
10. **Networking**
    - Access to potential investors
    - Access to potential customers
    - Access to business contacts/partners
    - Access to domain experts
    - Access to suppliers
    - Access to experienced entrepreneurs
    - Access to build contacts in incumbent company
    - Access to incumbent company's ecosystem
    - Peer support group (other participants)
    - Access to alumni network

Non-customized program specific activities and training
11. **Events**
12. **Workshop**
13. **Structured structured training and lectures**
14. **Demo day**

Program practicalities
15. **Time horizon of involvement/duration**
16. **Portfolio of other participants**
    - Number
    - Industry focus
    - Co-location
17. **Degree of structure (customization)**
18. **Frequent evaluations**
19. **Post-program services**

Figure B.1. List of resources, services and activities

Appendix C Interviewees

Below are the different interviewees and companies presented, the order in which these are presented is random, the codes names do not correspond to the order in which the interviewees and companies are presented.

C.1 Interviewed Startups

The names of the startups interviewed for this study, together with a description of their product or service, are presented in Table C.1 below.

Table C.1 Introduction of the interviewed startups

Name	*Short description*	*Location*
DeviceRadio	Solution to lower the technical threshold for IoT development.	Malmö
ConnectedYou	ConnectedYou is an all-in-one IoT marketplace on a mission to "catalyze IoT roll out" by offering to IoT customer's all key components of IoT like devices, connectivity, cloud services, security and other value-added services. Their vision is to truly democratize IoT.	Copenhagen
Medotemic	Medotemic AB develops products related to motion analysis designed for people with asymmetric walk.	Lund
Tempiro	Tempiro lets you monitor and control any electrical heating or cooling device remotely, saving money, reducing CO2 emissions and increasing comfort for homeowners and property managers.	Lund
SHFT	SHFT is the first ever virtual running coach, designed to help you run better, faster and with less injuries. SHFT accurately track and analyze your full body running style and statistics, through two intelligent pods that are placed on your chest and on your right shoe. Your running data is translated into simple, actionable and live coaching instructions.	Copenhagen
Flow Neuroscience	Flow Neuroscience's mission is to develop new ways to combat mental health issues with technology. The first product is a medication-free depression treatment that combines a brain stimulation wearable and an app-based therapy program.	Malmö

C.2 Interviewed Case Organization Representatives

The professional roles of the interviewees from the case organization are presented below:

- Internal Consultant
- Senior Manager
- Vice President, Software
- Director

C.3 Interviewed Subject Matter Experts

The experiences of the subject matter experts interviewed for this study are presented in Table C.2 below.

Table C.2 Relevant experience of the interviewed subject matter experts

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Experience of relevance for the study

Assistant Professor at the Department of Business Administration at Lund University, researching entrepreneurship and innovation including inter-organizational R&D alliances and startups.

Consultant working with startups, and also with larger companies supporting them in their innovation work and their aim to collaborate with startups. Has helped to create and establish an accelerator, E. ON's accelerator :agile, where he also was head coach for startups.

Experience of working with larger companies focusing on innovation, innovation processes and corporate-startup collaborations as a consultant.

Independent consultant managing technology-driven business growth. Experienced manager in global information and communication industry companies, e.g. previous Head of R&D at Sony Ericsson, Lund, and managing director at SOMC, Sweden. Also, previous advisor to the CEO of a startup.

Experienced board director/member for Swedish mid-cap technology companies, initiatives in the entrepreneurial ecosystem and universities. Currently chairman of the board of Malmö Startups and of The Faculty of Engineering at Lund University, among others. Also, previous CEO of a startup.

Appendix D Empirical Findings

D.1 Interviews with Startups

Presented below is a thorough description of the empirical findings collected from the startup representatives. First, the startups' strengths and weaknesses are described, followed by their current challenges to develop and grow, and their current needs. Further, it is described what each startup representative believes would be most valuable for them to be offered from a GHTC in a corporate-startup program. The representatives from the startups that participated in this study are presented in Appendix C. The startups are coded SU A, SU B, SU C, SU D, SU E, and SU F.

Main strengths for the startups

The factors characterizing the strengths of the startups mentioned by the interviewees are presented in Table D.1 below, together with references to the startups that mentioned it.

Table D.1 Strengths mentioned by the interviewed startups

Strength (Reference)	Description
Team (SU A, SU C, SU F)	Multiple of the interviewees mentioned the team and the experience and competences that the team possesses as a strength. Experience and competences include: market and customer knowledge and experience, technical competences, and understanding of pain points. one startup mentioned that their team possesses all of the competences needed to go to market. One of the startups mentioned that one of their main strengths are that they are small, fast and agile.
Strong technical competence related to core product (SU A, SU B, SU C, SU E, SU F)	All of the startup representatives have core technical competence in-house, and a majority highlighted that their technical competence is one of the main strengths.

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Uniqueness of Product or Service *(SU A, SU D, SU E)*	Multiple of the interviewees find one of their strengths to be the uniqueness of the solution. One startup believed themselves to have the furthest developed product in the world in their field which was also emphasized as a strength.
Network of stakeholders *(SU A, SU B)*	Two of the interviewees mentioned network of stakeholders. Including: stakeholders in the IoT-ecosystem and partners (e.g. B2B customers that the startup has a partnership with). Partnerships may help the startup to go to market and open doors.
Experienced advisory board and investors *(SU D, SU E)*	Experienced advisory board was mentioned as a strength by one interviewee. Further, two interviewees mentioned investors as a strength One of them mentioned that they have *smart investors*, i.e. investors that can contribute with something else than only money, e.g. exposure to an extensive network or provide expertise or support functions
Understanding of customers *(SU A)*	One interviewee stated that one of the strengths is their understanding of the market and customers, stemming from earlier work experience in the industry. This was highlighted as a strength, as the market in which this startup operates require specific expertise in order to succeed in it.

Main weaknesses for the startups

The factors characterizing the weaknesses of the startups mentioned by the interviewees are presented in Table D.2 below, together with references to the concerned startups.

Table D.2 Weaknesses mentioned by the interviewed startups

Weakness (Reference)	Description
Financial capital and access to investors *(SUA, SUC, SUF, SUE)*	Four of the interviewees indicated that one of their weaknesses is the lack of financial capital. One mentioned reason is that it takes time to be established on the market, especially with a solution that is completely new to the market and their target group (especially if the target group does not easily adopt new technology). To try to overcome this, the startup is working hard on their marketing plan. Another reason mentioned: financial capital is needed to not be slowed down. One mentioned that it is important to be careful with how much funding you accept and how much equity you have to give up in order to receive that funding. Two of the startups mentioned difficulties to receive funding from investors. Mentioned reasons: investors are aware that hardware development is expensive, and a small team size implies that there is limited time to spend on finding investors. Besides money, investors bring expertise and support.

Reaching customers (SUB, SU E, SU F)	Three startups elaborated on the ability to access customers as a weakness. A reason mentioned by two startups were that there is currently no similar solution on the market. Thus, it will be hard for these startups to sell the product as their potential customers will find it hard to understand it or simply just will not be looking for it.
	One startup highlighted that is harder to reach customers with a physical product than if is a software product or service. The startup also indicated that one of their weaknesses is their lack of experience of retail and sales of physical products.
Hardware development (SU C, SUF)	Two of the startups mentioned issues related to development of hardware as a weakness. Mentioned reasons: high costs of production, long production cycles which leads to a lot of time spent waiting, difficulties to change the product once it is produced (as opposed to software development).
Regulatory Constraints (SUC, SU D)	Two of the startups, that operates in different industries, indicated that one of their weaknesses is that they need certifications in place before they can start selling their product, or enter a new market.

Main challenges for startups to develop and grow

The factors characterizing the startup's challenges in order to develop and grow mentioned by the interviewees are presented in Table D.3 below, with references.

Table D.3 Challenges to develop and grow mentioned by the interviewed startups

Challenge (References)	Description
Human resources (SU A, SU B)	Two mentioned human resources. One challenge is finding *the right people*, i.e. people with passion for the company's product, possessing business and sales skills, or having expertise in IoT and having specific knowledge in e.g. how cloud services work, to hire. This is a challenge for the startup because there are not enough skilled IoT experts. Hiring experts is preferred as they do not require training and thus will not slow the startup down.
	Another startup mentioned human resources and specific expertise. However, the paradox implying that one of their challenges is that they need more people to grow faster, however if more people are hired bureaucracy in the company will increase and thus slow it down, was also mentioned.
Market access (SU C, SU D, SU F)	Three mentioned getting access to market. Further, another interviewee brought up the difficulty of reaching the target group as a challenge, including both marketing, PR and the fact that their product might be hard to sell directly to

end consumers, even though they are aiming to deliver a business-to-customer solution.

Challenges similar to weaknesses	
Financial capital *(SU B, SU D,* *SU E)*	The lack of financial capital was mentioned by multiple startups. Even if there is money in the company temporarily, financials have to be secured for the future.
Hardware development	The production of hardware and getting the production up and running at good quality.
Reaching customers *(SU E, SU F)*	The difficulty to be the first player on the market and reaching customers and selling a new product to customers who do not know that they actually have a need for this product. One interviewee mentioned that being the first player on the market imply the need for marketing and advertising, in order to reach their customers, which is expensive and challenging when lacking financial capital.
Regulatory constraints *(SU D)*	One interviewee mentioned regulatory constraints. First, it is a challenge to get the required certifications (if a company fails to get the certification they are unable to achieve full commercial delivery). Further, one company needs different regulatory approvals in different markets which implies a large resource commitment from the company, which is a challenge when scaling.

Major needs for startups to develop and grow

The factors characterizing the startup's needs in order to develop and grow mentioned by the interviewees are presented in Table D.4 below, with references.

Table D.4 Needs to develop and grow mentioned by the interviewed startups with references

Need *(Reference)*	*Description*
Human resources *(SU A, SU C)*	Multiple interviewees mentioned finding people. Mentioned reasons: to increase the technical expertise in the company, to increase market knowledge, and to increase the startups' chances of getting funding.
References *(SU B, SU E)*	One startup mentioned finding projects to take on. This will enable the startup to learn about their solution so that it can be developed further as well as getting references to help them attract partners, funding, and talent which in turn will help them grow. Furthermore, another interviewee mentioned market access and sales in order to get customers and references. Further, another startup emphasized that it will be easier to gain customers and increase sales if they have references.

Deep analysis (SU D)	One startup mentioned that one of their current needs is to get a deep analysis of their product from an expert perspective.
Financial capital, expand business and settle partnerships (SU F)	One startup indicated that their major needs right now is to raise money, expand their business into new industries, and settle a partnership with a company that can help them develop.

Would engaging with a GHTC enable startups to fulfill their needs and/or overcoming their challenges

The interviewees' answers if engaging with a GHTC would enable the startups to fulfill their needs and overcome their challenges are presented in Table D.5 below, with references, and in the form of mentioned prerequisites for engaging.

Table D.5 Prerequisite for engaging with a GHTC mentioned by the interviewed startups

Prerequisite for engaging (Reference)	Description
Win-win business relationship (SU A, SU B, SU E, SU F)	The majority of the startups indicated that the engagement needs to be set up as a business relationship, where both parties have stake and can contribute, to create a win-win situation. One startup indicated that a *make it or break it*-factor for their startup is if there is a business model that imply a win-win partnership, i.e. both parties need to be able to benefit and make money from the engagement.
Not being slowed down (SU A, SU B, SU D)	Three startups mentioned that the GHTC needs to make sure that the startups are not slowed down by or have to deal with bureaucracy.
Value for the startup (SU A)	One startup mentioned that the engagement has to bring a value to the startup and that they would not engage merely for the sake of engagement. As the interviewee expressed, they would not engage *unless it doesn't really bring certain value, or business relationships.*
Collaboration with the prominent in field (SU D)	One startup stated that the GHTC needs to be prominent in the field in which the startup operates. It is not enough that the company is prominent in any technology, it has to fully relate to the product or solution that the startup is developing

Different types of engagement with different partners *(SU F)*	One interviewee highlighted that the type engagement between the startup and the GHTC would be different depending on what company the startup is engaging with and depending on what their current situation is in terms of their business and other partnerships. The reason is that the type of partnership and the current situation of the GHTC will affect the possibility for the startup to grow.
Real purpose *(SU B)*	One startup mentioned that a *make it or break it*-factor for them is if there is a real purpose with the engagement for both parties.

Valuable assets, resources, services and activities that a GHTC could contribute with to mature startups

In order to give a holistic and nuanced description of what the different startups mentioned during the interview when this topic was brought up, the answers from all of the startups, respectively, are presented below in Table D.6, D.7, D.8, D.9, D.10, and D.11. Below the assets, resources, services and activities are referred to as elements.

Table D.6 Valuable elements in the offering mentioned by SU A

Element	*Description*
Ecosystem and win-win	SU A mentioned that it would be valuable to create an ecosystem together with a GHTC, where both of the parties can contribute and create a win-win situation. As the startup described *we would be more than happy to make a partnership when they see value in what we offer to customers.* Further, the interviewee mentioned that tapping into the ecosystem of the GHTC would be valuable in order to find business partners to integrate with.
GHTC as customer and credibility	SU A mentioned that it would be of great value to have the GHTC as a customer to their solution or integrate the GHTC's products and services with the startup's solution. Having larger brands as a customer and/or partner will bring credibility, validation and verification, which is one factor that would contribute to the startup in their current phase. Further, to have a collaboration with a larger brand will help the startup to attract other partners.
Skilled IoT resources and support to accelerate development	Skilled IoT resources are considered to be one of the most critical factors for SU A. However, SU A pointed at the fact that in order for a GHTC to contribute to the startup, the GHTC will need something in return, e.g. equity. If the GHTC wants to provide resources in exchange of equity SU A is looking for skilled IoT resources and support to accelerate development.
Expertise from employees and gaining insights	SU A indicated that learning about their technology is not their main focus as the interviewee believes that the team has enough knowledge internally regarding the solution they are developing. However, the interviewee also indicated that meeting with the employees in a GHTC can give the startup

many valuable insights rather than having someone in the GHTC to only do their job.

Financial capital	In order to speed up the startup's development they need financial capital, and the interviewee brought up this factor as a potential offering from a GHTC. Financial capital is considered to be one of the most critical factors.
Validate idea	SU A sees potential value in having a *bigger audience* to discuss and validate their ideas with.
Customer knowledge and access to customers in the long-term	SU A highlighted that it would be valuable for them to learn about customers in different fields. SU A also indicated that getting access to the GHTC's customer segment could be valuable, however, it may imply a long-term engagement. However, if the two parties were to establish a partnership and develop something together the interviewee would be open to co-brand products in order to sell through the incumbent company's channels.
Make the collaboration a priority	SU A mentioned the importance of making the collaboration a high priority and that the GHTC needs to realize the importance of the engagement for the GHTC. Further, the GHTC needs to understand what they can gain from the engagement working with this kind of startup; what are the biggest pain points the startup solves for them but also how the GHTC and the startup best match together.
Market access	SU A emphasized the challenge that customers will not buy their product since it does not come from an established well known-brand, but it comes from a startup.

Table D.7 Valuable elements in the offering mentioned by SU B.

Element	*Description*
Access to the customer segment of a GHTC	SU B highlighted that an engagement with a GHTC could be valuable as it could provide access to the customer segment of the GHTC and also access to projects with the customer segment of the GHTC.
Channel partner and brand	Two reasons to why SU B would choose a particular partner is if the partner has a well-known brand (want to have a strong brand as a reference) and potential to be a future channel partner. This can help the startup to opening door
Collaborate on projects	SU B mentioned that for them it would be of great value to collaborate on different projects. The interviewee suggested that this is the preferable engagement type. It would be the best way for the GHTC to gain value from the engagement according to SU B. SU B would especially benefit from this type of engagement if there is a budget for the projects. Further, SU B believes that collaborating doing projects imply risks for the company hosting the engagement, i.e. the stake for the GHTC is significant, which the startup believe would make the collaboration less

bureaucratic and avoid slow processes and help make decisions faster and be more flexible. One way to accomplish the collaboration on projects in practice, suggested by SU B is that the GHTC exhibit project proposals that startups can apply for, however, it is important that the application is not too complicated and time consuming as this will discourage startups from applying.

Network	SU B mentioned that they would find it valuable to tap into the network of the GHTC, as the interviewee described it *they do already have a lot of connections with other companies and they get project request*s. Hence, an engagement could potentially expose this startup to the many different opportunities to do projects with the GHTC's contacts.
Access to customers in the long-term	SU B believed that getting access to the customer base of the GHTC is interesting but may imply too much of an engagement which SU B is not willing to take on from the start. As the interviewee described it*, I think for us the first step is to not just look at the nice juicy customers but to first focus on them* [the GHTC] *to try to work together with them and see more of the long-term thing to get access to their customers. Because that is our goal with the collaboration partners, to sort of in the long term see them as a channel partner and we can use them to reach out to their customers. But I think it's good to not have that discussion too early.*

Table D.8 Valuable elements in the offering mentioned by SU C

Element	*Description*
Exchange of knowledge	SU C mentioned that exchange of knowledge would be valuable. Even though the interviewee believes that they have know-how internally, it was highlighted that it would be valuable to have an internal advisor from a GHTC to whom the startup can ask questions they have and discuss different challenges, related to e.g. hardware production, setting up logistics, setting up production, and other functions you need to get in place in order to run a company.
Technical advice and product development	SU C emphasized the value of getting technical advice related to how to develop and design the product, related to both software and hardware. SU C also emphasized that it would be especially helpful for them to get help from a hardware-based supplier.
Market access	SU C mentioned that market access to distribution channels is regarded as very valuable for the startup. SU C are open to co-brand their products in order to get market access, and also *white labelling* i.e. putting the GHTC's brand on their product.
Certifications	SU C emphasized receiving help from the GHTC with certifying their products in order to start selling. Further, SU C wants to build their know-how and thus the interviewee emphasized that they prefer to get help in the form of coaching in order to learn how everything is done, as opposed to outsourcing it. The only exception to this is the certification and activities not related to their core business.

| Go-to-person/ head coach | SU C mentioned that something beneficial, that they had experienced in a previous support program was that they had a head coach throughout the program, which was a one point of contact, and then they had other specialized mentors they could access when needed. |

Table D.9 Valuable elements in the offering mentioned by SU D

Element	*Description*
Full commitment and close ties	SU D emphasized that for an engagement with a large company to be interesting, the company they engage with should be fully committed. One reason for this is that they do not want help from someone in the GHTC spending just a couple of hours here but rather get access to people who are fully engaged and are with the startup for a longer period of time, and who is available to discuss things in depth. Further, SU D said that they have an extensive network of advisors, hence if the collaboration is too shallow, they are not interested. They only want coaching or advice from the GHTC if there are very close ties.
Market access and customer knowledge	SU D finds market access and market expertise to be one of the most valuable elements. Further, SU D highly value sales channels and only wants to engage with companies that have similar target customers as they have. The reason for this is to enable the startup to potentially sell their products to the target customers, both online and offline, and that the GHTC is able to inform the customers about the product. In order to do this, the startup is most likely willing to co-brand their product or make them look similar as the GHTC's products. Further, SU D would be willing to learn from the GHTC's experience with these customers.
Network	SU D mentioned that they see potential in tapping into the network of different contacts that the GHTC might have and getting introductions.
Go-to-person and depth	SU D emphasized that they would like to have a go-to-person who understands their problem deeply because it takes a lot of time to explain their product to people in the GHTC that may need knowledge about the product in order to help them.
Streamlined processes	SU D stressed the fact that, for the engagement to be valuable, the process during the engagement has to be streamlined.

Table D.10 Valuable elements in the offering mentioned by SU E

Element	*Description*
Win-win business partnership	One aspect that SU E stressed most is that the engagement should be a *win-win*, i.e. it has to be a business partnership where both parties can contribute.

Integrating solutions	SU E indicated that they want to engage with companies that have a service or product that can be integrated with theirs, in order to leverage the product or service of both parties. One way of doing this in practice suggested by SU E, is through licensing the startup's technologies. In this case, the startup believe that they will be able to expand the current business portfolio of the GHTC if the implementation of their solution into the products of the GHTC is successful, and the solution of the startup would be leveraged by being included in the portfolio of the GHTC and the startup could charge the GHTC for the licenses.
Technological development	SU E sees potential in getting help from the GHTC with development and implementation of certain technological parts needed in order to improve their product.
Work together on projects and market access	The interviewee suggested that another attractive alternative is to work together on a project where the GHTC dictate what they want and thereafter, the startup develop the product or service and the GHTC licenses the solution and sell to their customers. As a consequence, the startup will earn money from the fees of the licenses and the GHTC will develop their product without developing them themselves
Minimal steering and interfering with the startup's way of working	SU E thinks that the GHTC should avoid steering the startup and not fit them into the structure and processes of the GHTC, but rather let the startup work in the way that works best for them. However, the GHTC can set the frames for the engagement but should not interfere too much with the processes in the startup.
Clearly defined expectations	SU E stressed the importance of clearly defined expectations and the fact that it is important to settle what the collaboration between the startup and the GHTC actually entails before it commences.

Table D.11 Valuable elements in the offering mentioned by SU F

Element	*Description*
Market access, marketing and win-win partnership	SU F highlighted the value of getting access to the marketing muscles and sales channels, and further mentioned that the GHTC can push the startup's product to their customer base and this will enable the startup to focus on developing their core product and technology. Additionally, this will enable the GHTC to expand their portfolio. Thus, this will help to lay the foundation for a win-win partnership as both parties can complement each other. The interviewee highlighted that access to markets, customers and marketing support are some of the most valuable elements due to the challenges related to be amongst the first players on the market and the fact that the customers have never heard of the product.
Financial capital	SU F highlighted that engaging with a GHTC, especially if it is well-known, will help the startup to raise financial capital. Either the startup can receive financial support directly from the GHTC, or, the interviewee believes that

engaging with a well-known GHTC will help the startup, indirectly, to raise money from external investors. The reason behind is that the interest from external investors will increase if the startup is engaging with a GHTC as this shows that the GHTC believes in the startup.

Enable startup learning	SU F highlighted that startups always have to learn and develop by e.g. surrounding themselves with experts. SU D claims that if a startup thinks that they know everything, they will die since a single mistake can kill the startup. Therefore, the interviewee emphasized that any help, in any form, is always good.

Risks related to engaging with a GHTC

The risks related to risks to engage with a GHTC mentioned by the interviewees are presented in Table D.12.

Table D.12 Risks mentioned by the interviewed startups

Risk	Description	How the risk can be reduced
Not balanced terms of the collaboration: different risk profiles	Two of the startups highlighted the risk that the startups are in a so-called *David and Goliath-position*, and if the engagement fails, the startup risks to be severely hurt or even die, and the GHTC would not be as affected. A program that lasts for only a couple of months can have huge impact on the startups' progress, especially if it is unsuccessful.	According to one, this risk can be reduced by engaging together in projects where both parties have stake and is beneficial for both parties. Further, the interviewee mentioned that the risk of the collaboration will depend on the priority and importance the engagement has for the GHTC; the risk can be reduced if the GHTC sees the collaboration as high priority.
Not balanced terms of the collaboration: no real purpose	Two startups pointed at one risk being that the GHTC is not seeking business value (e.g. sees it as a PR initiative). The interviewee mentioned that they did not want to engage with a company that *hide them in their dungeon and show them off to everybody, how innovative they are - like a canary or something*. Furthermore, this startup sees a risk in their name disappearing when engaging with large incumbent companies.	It was suggested that working on common projects where both parties have stake could reduce this risk.
Legal issues	Another risk brought up by an interviewee is that the GHTC *gets inspired* by their product and *steal their idea*.	N/A

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| Being slowed down and inhibited way of working | Multiple startups mentioned the risk of being slowed down by the GHTC, and that the company will apply their *large corporation mindset* when collaborating with the startup, which is suggested to inhibit the development of the startup as well as affect the startups in a way so that they lose focus on the customers' needs and lose the understanding of why they are actually developing the product. | N/A |
| Closing doors | One startup stressed the fact that if a startup is engaging with one company it might imply that they cannot engage with other companies, which may close some doors for the startup. | N/A |

D.2 Interviews with the Case Organization

Presented below is a thorough description of the empirical findings, collected from the four case organization representatives interviewed. Objectives for a GHTC to host a corporate-startup program; how engaging with startups enable the GHTC to meet their objectives; potential risks for the GHTC when engaging with startups; what assets, resources, services and activities should be provided by a GHTC to startups in a corporate-startup engagement are presented below. The interviewees are coded COR A, COR B, COR C, and COR D.

Objectives for a GHTC to host a corporate-startup program

The indicated potential objectives for why a GHTC would establish a corporate-startup engagement are presented in Table D.13 below, together with references to the representatives that mentioned it.

Table D.13 Objectives for a GHTC in an engagement with startups mentioned by the case organization

Objective	Description
Impact way of working (COR A, COR B, COR C, COR D)	Improve ways of working; speed up innovation processes; learn from the *startup community* and other incubators and accelerators how to improve and accelerate the internal businesses, get inspired by startup's way of working, how they validate their product and business plan, how they go to market
Access external innovations (COR A, COR C)	Broadening the uptake of new ideas and concepts; build up a product portfolio; strengthen the IoT value proposition to customers; get access to new *base technologies*
Expansion (COR A, COR D)	Expand current businesses
Complementary products (COR B)	Complement the company's current technologies to create a *full offering* to customers, enhance product offering of the company
Solve business problems (COR B)	Help developing technologies and products that the GHTC does not have to time to, or are unable to, develop internally
Positive impact of the brand (COR B)	Strengthen the brand and be a more attractive employer and attract talent

Financial returns   Make more money

(COR C)

How would engaging with startups enable the GHTC to meet the above-mentioned objectives

How engaging with startups would enable a GHTC to reach the objectives just mentioned are presented in Table D.14 below, with references.

Table D.14 How startups enable a GHTC to reach its objectives mentioned by the case organization

Objective (Reference)	Description
Learn from startups (COR B, COR C, COR D)	One of the objectives mentioned for why a GHTC should engage with startups is that the GHTC could learn from the startups. One of the learnings mentioned was regarding the startups' way of working. One interviewee indicated that, in order for the GHTC to learn about the startup way of working, the GTHC and the startup should sit and work together. Further, the GHTC can speed up their innovation processes by complementing the internal resources with new innovations and talent.
	Furthermore, an engagement with startups was suggested to help the GHTC to enhance innovation and get inspired by the entrepreneurial spirit that the startups can bring. This can help the GHTC to compensate for not being as agile and creative as startups. Thus, this was suggested to contribute to the GHTC's way of working, the generation of ideas, and to expand the company's current business. Further, another perspective that was highlighted was that the differences in nature of a startup and a GHTC may be too large that they can never share the same mentality, i.e. the startup mentality will never be transferred to the incumbent company however the GHTC can learn how to create innovation capacity and agile methods of working.
Expand portfolio (COR A, COR B, COR C, COR D)	Furthermore, another objective that was raised is that the GHTC can expand their portfolio by engaging with startups. As one interviewee indicated, a GHTC might not be able to do everything they want to do themselves internally, however, *by collaborating with startups I think we can get hold of both hardware and software solutions that can be very useful for us.* Further, by finding startup whose product complement the GHTC's portfolio, added value and synergies can be created at the time of sales. The interviewee mentioned that the GHTC needs to be creative in order to find ways to achieve an expanded portfolio by collaborating with startups and there were four possible ways of doing it mentioned by case organization representatives. Mentioned alternatives were: (1) to brand the startup's product with the GHTC's brand or co-brand and sell it through their channels**,** (2) license the technology developed by the startup and incorporate it into the GHTC's products or services, (3) buy the product

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from the startup and then sell it to the customers of the GHTC as part of their portfolio, and (4) invite the startup to sell their products or services directly to the customer of the GHTC by making recommendations and introductions. However, it was mentioned that branding the startups' products with the GHTC's brand might imply challenges.

Strengthen brand and become a more attractive employer *(COR D)*	Furthermore, two objectives mentioned were to strengthen the brand and to become a more attractive employer. One of the interviewees mentioned that the brand of the incumbent company will only be strengthened if the corporate-startup program is successful. The interviewee defined an engagement as successful if the engagement implies a win-win situation, i.e. both parties can benefit from the engagement.
Create a win-win *(COR D)*	One of the interviewees emphasized that the win-win situation is required in order for the GHTC to gain advantages from collaborating with startups. In his opinion, a win-win situation can be achieved through a sustainable business partnership where both parties can support the other party and improve each other's businesses. Further, the interviewee mentioned that in order for the engagement to be successful the ambitions and strategies of both parties must be aligned. However, it was emphasized that it might be difficult. Moreover, according to the interviewee this implies that the terms and the arrangement should be clear from the beginning of the engagement, from both the startup's and the GHTC's perspective.

Potential risks for a GHTC to collaborate with startups through a corporate-startup program

Mentioned risks for a GHTC when engaging with startups are presented in Table D.15 below, with references.

Table D.15 Risks for a GHTC when engaging with startups mentioned by the case organization

Risk *(Reference)*	*Description*	*How the risk can be reduced*
Expectations are misaligned *(COR A)*	One interviewee mentioned that the expectations from the startup and the company may not be aligned and that the GHTC cannot offer what the startup needs.	In order to reduce this risk, it was suggested that it should be clearly defined what the GHTC can and cannot offer.
Not knowing what it takes to create a successful collaboration *(COR D)*	One interviewee pointed at the risk of not knowing what it takes to create a successful engagement and the consequence would be that it eventually fades out to being nothing.	To reduce this risk, it is important to align the expectations of the outputs of the engagement from the beginning, from both of the parties.

Legal issues and IP *(COR A, COR B, COR C)*	Two perspectives were brought up regarding risks related to IP and legal issues: 1. If the startup is working on something similar to what is developed internally in the GHTC it might cause legal issues. 2. If the startup and the GHTC sign an NDA and the startup shares their ideas with the incumbent company, the incumbent company may not be able to develop anything related to that idea due to the protection that comes with signing an NDA.	1. In order to reduce the risk of this happening it is suggested by multiple interviewees to solve as much of the legal agreements of the engagement from the start, by e.g. setting up contracts before the engagement commences. 2. In order to reduce that risk, the interviewee suggested to be clear about what kind of IP that is shared. One of the interviewees indicated that he believes that this is the biggest risk with a corporate-startup program.
Startup fails *(COR B, COR C, COR D)*	One interviewee mentioned the risk that the startup will not succeed. This was considered to be a *very likely risk.* This was brought up by another interviewee as a short-term risk. Two interviewees highlighted that if the company engages with startups and they fail, it will imply bad-will for the brand of the GHTC. It will especially have an impact on the image of the innovativeness of the company according to one of them.	This risk can potentially be reduced by only engaging with startups that have a substantial amount of capital or have owners with capital to spend. However, one interviewee pointed at the fact that even if the startup fails, the GHTC can still learn something from them.

What assets, resources, services and activities should be provided by a GHTC to startups in a corporate-startup engagement

The answers of the case organization representatives are shown in Table D.16 below, with references. The assets, resources, services and activities are referred to as elements below.

Table D.16 Valuable elements for a GHTC to provide in a corporate-startup engagement mentioned by the case organization.

Element *(Reference)*	*Description*
Win-win business partnership *(COR D)*	One interviewee highlighted that one of the most relevant outcomes from a corporate-startup program from a startup's perspective is to achieve a win-win business partnership
Real value for startups *(COR A, COR D)*	Multiple interviewees emphasized the fact that the offering from the GHTC needs to be something substantial that fills a real need that the startup has.

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Aligned expectations *(COR A, COR D)*	Furthermore, one interviewee indicated that it is important that the startup has a clear vision of what they want support with and that the expectations from the GHTC and the startup are aligned from the start. Also, another interviewee indicated that the startup needs to have a clear purpose of engaging with the GHTC and see a real value, but they must also be aware of the cost of the engagement, either in terms of equity and extra work, and the interviewee emphasized that this cost must be accepted by the startup before the engagement commences.
Technology exchange (COR D)	One highlighted that one of the most relevant outcomes from a corporate-startup program in general, from a startup's perspective is to exchange technologies.
Access to technologies *(COR A, COR D)*	Two emphasized that the GHTC offer access to the technologies of the GHTC, including access to IP of the GHTC. However, one of the interviewees highlighted that there is a risk to become too intertwined with a startup too soon in the engagement, and thus the interviewee believes that technologies can be transferred both ways in the engagement, but they should not be developed together.
Minimum steering and interference *(COR B)*	One emphasized that the GHTC should not interfere with, or steer, the startup too much.
Customized program *(COR A)*	One emphasized a belief that it would be most beneficial if t collaboration is tailor-made to fit the startups, due to the vast differences between the startups.
Offering focused around the USP *(COR D)*	Multiple interviewees believed that the GHTC's offering should build on what the startup cannot receive from other companies or support institutions.
Provide expertise *(COR C)*	One suggested that focus of the offering should be to help the startup to develop, produce and sell their solution, and that the GHTC should not be a *consultancy company*. Further, one interviewee indicated that due to the expertise in the GHTC they may be able to give feedback, advice, and coaching as well.
Brand and credibility *(COR C)*	Two highlighted that the power of the GHTC's brand is part of a valuable offering, e.g. by letting the startup referring to an engagement with a well-known brand. Mentioned benefits were: help to open doors, a quality stamp for the startup, make it easier for startups to raise money from external investors, it will increase credibility.
Networks *(COR A)*	One indicated that a GHTC can help a startup to open doors by offering access to building a network by setting up contacts with customers and partners of the GHTC.

Market access	A majority emphasized that they believe it is important to offer sales channels to startups and enable the startup to sell their product. Different ways of how this could be done in practice were suggested: branding the products the brand of the GHTC, co-branding or sell the products under the startup's brand.
(COR B, COR C, COR D)	
Being the customer of the startup	Three mentioned that the GHTC can become a customer of the startup either through licensing or buying the startup's solution. However, one interviewee emphasized the fact that it is difficult to do business, and sell solutions to large incumbent companies, due to the many, and high, demands these companies have. Therefore, it was suggested that it is probably a better solution to sell something together by integrating the solution of the startup with a solution from the GHTC. However, there might be a liability problem if the products are too dependent of each other.
(COR B, COR C, COR D)	
Product development	One believes that it would be valuable to offer hardware and software development, including services that the GHTC has accessible in-house, such as hardware design. Furthermore, to support with producing prototypes was mentioned.
(COR A, COR C)	
Business support	One suggested offering *business support*, i.e. giving advice and support to develop the business model of the startup.
(COR B)	
Help to set up a value chain	One mentioned that the GHTC should help startups by sharing knowledge about how to set up a business, i.e. setting up and arranging all the components in the startup's value chain, e.g. manufacturing or shipping. The reason behind is that the GHTC can use their experience, contacts and brand power to help the startups secure what they need and thus contribute sustainable value, helping the startups to be self-sustained after the engagement.
(COR C)	

D.3 Interviews with Subject Matter Experts

The empirical findings, collected from subject matter experts are presented below. Five experts in the area of corporate-startup collaborations were interviewed with the purpose to bridge the gap between the perspective of the startups and the perspective of the GHTC, and to provide an external objective perspective on collaborations through corporate-startup programs. The subject matter experts interviewed have a variety of experiences and professional roles and thereof, they contribute with different perspectives on the discussed issues. The subject matter experts participated in this study and their relevant experiences for this study, can be found in Appendix C.

Potential benefits for a GHTC to engage with mature startups in the IoT-Sector

All of the subject matter experts interviewed expressed the belief that it can be beneficial for a GHTC to engage with mature startups in the IoT-sector. There were several benefits for collaborating with startups mentioned during the interviews, these are presented in Table D.17 below, together with references to the experts that mentioned it.

Table D.17 Benefits for a GHTC to engage with startups mentioned by subject matter experts

Benefits (Reference)	Description
Strengthen brand and employer branding (EXP 5)	One interviewee mentioned strengthening the brand of the GHTC, employer branding, and attraction of talent, as potential benefits for a GHTC. However, the expert emphasized that the company needs to be transparent and honest and the startups about the purpose of the engagement. The expert further emphasized that honesty and transparency of the purpose of collaborating is important for both parties.
Increase learning and reduce inertia (EXP 1)	One potential benefit that was mentioned by multiple interviewees is the opportunity for GHTCs to learn from startups and their way of working. One interviewee indicated that this could help the GHTC to compensate for the corporate inertia, which (according to the interviewee) is usually caused by a GHTC's brand and resources, which are also the strength of large corporations.
	Another interviewee also emphasized the benefits, for GHTCs, to learn from the startups' way of working. The aspects that were highlighted related to the startups' way of working were that startups work quicker and closer to the end user. As startups have another way of working, they are suggested to *do a better job* than large companies do even though they have a lot of resources. A GHTC may have a lot of technical know-how and

assets to build upon, but they also need to understand the need of the customer to solve their problem.

Increase adaptability *(EXP 3)*	One interviewee emphasized that the uptake and penetration of technology has accelerated and that it has an impact on large companies' competitiveness. Hence, soon large corporations cannot be competitive unless they learn how to be adapt faster to these changes. This is especially relevant for large companies where the high degree of inertia is hindering them from adapting fast.
Exchange of ideas *(EXP 1, EXP 5)*	Two experts mentioned that the exchange of ideas between a GHTC and startups is valuable and a potential benefit. *Bringing new people in and new ways of working will be a big benefit for the big company.*
Gain inspiration from startups *(EXP 3)*	One interviewee highlighted, in large corporations there is a complacency amongst the employees due to the experienced safety that comes with being permanently employed in a large company. Hence, the importance of being inspired by the individuals in the startups is highlighted by one interviewee.
Reducing threat of startups *(EXP 2)*	One interviewee indicated that a potential benefit for GHTCs that collaborate with startups is that they get closer to them and thus, the threat startups are proposed to constitute is thought to be reduced. The interviewee explained that companies may be used to keep track of only large established competitors, but it is impossible to keep track of all of the emerging startups, hence the importance to collaborate with them increases.
Impact the culture *(EXP 1, EXP 5)*	Positive impact on the corporate culture is mentioned as a potential benefit by two interviewees; one suggested that engagement with startups is a way for companies to break old habits and gain new impressions from the outside. Further, it can reduce the "Not invented here" culture that large companies may have. This culture implies that they overestimate the excellence in their own brand and products and diminish the work of others. Therefore, collaborations with startups may open the eyes of large companies and prevent this culture. Further, another expert suggested that the GHTC *should go in for the long-term and expect to change the culture from scratch*
Increase creativity *(EXP 4)*	One interviewee suggested that collaborating with startups is a way for GHTCs to compensate for their lack of creativity, caused by the rigid structure of a large company. The interviewee suggests that structure and creativity are two extremes on the same spectra, meaning that one cannot be increased without reducing the other.
Access technologies *(EXP 2)*	One expert mentioned access to the particular technology that the startup offers

Potential risks and challenges for GHTC to engage with mature startups in the IoT-Sector

Mentioned risks and challenges for a GHTC when engaging with startups are presented in Table D.18 below, with references.

Table D.18 Risks and challenges for a GHTC when engaging with startups mentioned by experts

Risk or Challenge (Reference)	Description
Corporate-startup program is unsuccessful (EXP 3)	One expert emphasized that launching a corporate-startup program is a *huge risk* to take and the company has to understand what is needed, and to learn that is a challenging task. Further, one expert argues that if the initiative fails (i.e. lack of interest from startups) *it will be really difficult to have a second chance, it will take years to come bac*k if the GHTC wants to do it and the GHTC needs to be assertive that they know what they are doing.
Lose talent (EXP 3)	One expert indicated, a risk is to lose talented people to the startup because they see opportunities in other areas.
Having the startup as a supplier (EXP 4)	One expert indicated that it is a risk to rely on a startups technology, since the likelihood that the small company will be bought by a competitor is relatively high. Further, another difficulty with having the startup as a supplier mentioned by the expert is a consequence of the differences between a startup and a large company. The expert emphasized that the demands that the large company puts on the small company will eventually end up being too big and the small company ends up being too reliant on one single company for a customer because there is simply not the bandwidth. Hence, the expert indicates that not so seldom it ends up with the smaller company being bought.
Lack of alignment (EXP 2)	One expert indicated differences in nature between a company and a startup can lead to lack of alignment which is a challenge. The large company has bureaucracy, routines, structures, political systems and established ways of doing things. The startup, on the other hand, do not have established routines and norms and can be compared to a circle of people working together, compared to the pyramid of the large company. Accordingly, the expert explains that *there is a certain way of how things are being done in a big organization, that are just not aligned with how things are getting done in a startup*. As a consequence, it can be difficult for these two actors to coordinate with each other. To deal with this issue, the GHTC and the startup have to be aligned. The expert explained that one part of it is *interorganizational alignment,* i.e. the two actors need to understand issues such as *what are the intention, why are we doing this, what are we doing, what do we expect to get out of it and in what time frame, what happens if we fail.*

Different time perspective	One expert highlighted the time perspective as a challenge, for large company's decision making is slow because of the bureaucracy, but at the same time they expect immediate results which startups might not be able to deliver since startups usually have a longer time frame before the product is profitable, *up to ten years*. Hence, the expectations of when result is expected from the collaboration must be clear from the start.
(EXP 2)	

Critical aspects for a beneficial corporate-startup engagement

Mentioned critical aspects for a beneficial corporate-startup engagement are presented in Table D.19 below, with references.

Table D.19 Critical aspects for a beneficial corporate-startup engagement mentioned by experts

Aspects *(Reference)*	*Description*
Customize the offering *(EXP 3, EXP 5)*	One expert mentioned that companies should engage with startups, *if* they can provide an offering that enables startups to fulfill their needs, overcome their challenges and help them achieve their vision. Further, another expert indicated that the GHTC needs to think through what should be offered and find the right ways to collaborate in order to make the collaboration beneficial for both parties. The interviewee further argued that the corporate-startup program should be tailored to the specific startup especially when it is newly launched. Later, when the GHTC *has been able to prove itself as a reliable and trustworthy partner in this setup then you can become a bit cockier*.
Define objectives *(EXP 3, EXP 5)*	Two experts indicated that it is important for the GHTC to understand and define what they want to achieve with the collaboration in order to leverage the collaboration. This will enable the organization to stay focused, be set up to move in that direction and by having clear metrics the progress can be followed up. Further, the objectives need to be communicated internally and externally. As the expert expressed *the initiative cannot be a reaction to a fad*. If there is no clear defined objectives or reasons for collaboration, that might result in frictions within the company and between the startup and the company. Additionally, the company must dare to invest money, but receive something else in return. Even though the objectives are not financial, there can be other benefits that eventually results in increased revenue.

Potential benefits for mature startups in the IoT-Sector to engage with a GHTC

All of the subject matter experts interviewed expressed the belief that it can be beneficial for mature startups in the IoT-sector to engage with a GHTC. There were several benefits for collaborating with GHTCs mentioned during the interviews, these are presented in Table D.20 below, with references.

Table D.20 Benefits for a startup to engage with a GHTC mentioned by subject matter experts

Benefit (Reference)	Description
Financial support *(EXP 1, EXP 2, EXP 5)*	A majority of the experts mentioned financial support. One interviewee said that startups are in constant need of financial support.
Access to expertise *(EXP 1, EXP 4, EXP 5)*	A majority of the experts mentioned access to expertise. According to one, startups may need specific expertise that large companies are able to provide but that is hard to find elsewhere. Further, expertise may include knowledge about technologies, markets, services, and operations.
Access hardware development *(EXP 1, EXP 3)*	Two mentioned benefits are hardware support and access to competent hardware suppliers. Hardware is more time-consuming to develop and need to be produced in batches, in contrast to software.
Access to technologies *(EXP 4)*	One expert mentioned that access to technologies that GHTCs have would be a possible benefit for startups.
Gain legitimacy and power *(EXP 2)*	One expert mentioned that a startup could gain legitimacy and power from collaborating with a GHTC and thereby compensate for their liability of smallness and liability of newness (i.e. that the startup does not have the power to drive the market forward and the startup is not yet seen as a legitimate actor by other actors in the ecosystem). Specifically, legitimacy and power are gained by piggybacking on big brands and communicate the engagement. In turn, legitimacy and power can be used to attract talented employees, acquire new customers and get investor capital. The latter is a consequence of the market value of the startup, since the market value is usually difficult to estimate. Investors face a market based on signals and beliefs. However, the interviewee indicate that different large brands have different types of legitimacy and power.
Access to customers and markets *(EXP 1, EXP 4, EXP 5)*	Access customers and markets was mentioned by a majority of the experts. As two interviewees suggested, this can be gained either through selling directly to the GHTC or by accessing their customer base. Access to the customer base could imply introduction to customers, bundling of products. Further, one interviewee stated that customer and market knowledge can be provided in order to better understand how to reach the market. Another expert mentioned that market access is a common reason for startups to collaborate with larger companies.
Customized value chain support *(EXP 4)*	It is beneficial for both parties to do an analysis of the value chain between the startup's solution and the end user, to find a strategy for how to reach the market and how the GHTC can enable that.

Potential risks for mature startups in the IoT-sector to engage with a GHTC

Mentioned risks for mature startups in the IoT-sector to engage with a GHTC are presented in Table D.21 below.

Table D.21 Risks for a startup to engage with a GHTC mentioned by experts

Risk	Description	How this risk can be reduced
Startups have more to lose	One of the experts highlighted that startups have more to lose and thereby, the risk is much greater for the startup.	Create a win-win collaboration; the GHTC *needs to be humble to understand the daily life of the people in the startup;* the GHTC should not have an intention to control the startup.
Slow the startup down	One of the experts mentioned that a risk is that the startup gets slowed down.	The GHTC needs to find people within the organization that are dedicated and authorized to make decisions with their own budget in order to not slow the startups down.
Unbalanced distribution of power	One expert mentioned that the risk for the startup is high, since *few entrepreneurs have experience of running a startup and when they meet the machinery of corporate lawyers, seasoned executives and seasoned dealmakers it's really easy that they just get completely screwed.*	N/A
GHTC as customer: complicated business agreements	If business agreements are too complicated, it will be time-consuming and may require legal work for the startup, which will expose the startup to risk, because it may slow them down or be expensive.	The GHTC need to simplify the business agreements, if they will act as the customer to a startup. Further, to handle the business agreements, the expert suggested two approaches (1) to set up pilots that are easy to get started and (2) ensure that the starting point for collaboration is *done quickly and in a way that is sort of no strings attached, it can be ended at any time*
GHTC as customer: too dependent of one customer	One risk, the most critical risk according to one expert, is if the GHTC becomes a customer of the startup; this may lead to the parties being too dependent and that the startup starts to rely on one customer and focus all their resources and attention on that company and focus on other	N/A

	customers diminish. The interviewee emphasize that this risk is common.

Scale too fast	One expert mentioned that it is a risk for startups to get access to a large customer base as scaling too quickly is mentioned as a common reason to why startups fail as they may lose focus on developing the product gradually in close contact with customers and miss important learnings along the way.	GHTC should be careful when supporting startups to reach customers, so that the startup does not scale too fast i.e. enable sustainable scaling. Further, the time limitation of engagement should be considered so that sustainable scaling is possible.
Strangled by rules and activities	One expert indicated that it is important that the corporate-startup program does not strangle the startups with rules and mandatory activities that are specific to the engagement, so that they will be able to focus on their business.	N/A
Legal risks	One mentioned legal risks and stolen IP	N/A

What assets, resources, services and activities should be provided by a GHTC to startups in a corporate-startup engagement

The answers of the subject matter expert representatives are shown in Table D.22 below, with references. The assets, resources, services and activities are referred to as elements below.

Table D.22 Valuable elements for a GHTC to provide in a corporate-startup engagement mentioned by subject matter experts

Element (Reference)	Description
Brand (EXP 1, EXP 3, EXP4)	Three mentioned that brand is a very valuable asset to provide, one emphasized that it is the most valuable element in an offering. It is suggested to help build credibility for the startup which is beneficial in e.g. negotiations. One expert mentioned that using the GHTC as a reference is very valuable. Further it is suggested to help to open doors, especially if the startup is able to present the collaboration externally. Moreover, one expert mentioned that one alternative is to brand the startup's product with the GHTC's brand, which would further increase the credibility of the startup. However, it was emphasized by multiple experts that using the brand can be a disadvantageous for the startup because large companies have rules and expectations about how their brand is used, thus it will limit what the startup can do, and the startup will need to ask for permission. As one expert argued using the brand will *put too much limitation on what the startup can do* and if the brand

is associated with a product, the GHTC *will watch over them like eagles.* Startups would be limited in their way of doing business as it might not meet the demands of how the brand is allowed to be used. Further, the expert argued that a GHTC cannot assume that startups can handle the expectations that comes with using a large brand.

Market access *(EXP 3, EXP 5)*	Two experts discussed market access. One expert emphasized that getting access to markets is a difficult task for a startup and that inexperienced entrepreneurs tend to underestimate this challenge. Hence, GHTCs should provide support to startups in this area. The expert mentioned two ways: train startups to identify the customer value and to provide channels to the startups and it is described as valuable for startups. Channels may imply that the GHTC invite the startups to meetings with customers, if the startup's business idea is adjacent to the GHTC's. However, channels are suggested to imply a need to think of ROI. Another expert also mentioned that getting access to market would be *very important for startups* and several ways to get access to markets was mentioned: access the GHTC's customer base (including meeting the GHTC's customers and have a workshop with them to talk about a potential match), to sell the product directly to the customers of the GHTC and for the GHTC to recommend the startup to their customers. It is a valuable merit for a startup to have a recommendation from a GHTC and a credible reference. When being asked about co-branding, the expert emphasized the need for the GHTC to be honest to their customers that it is a startup's product.
Industrialization knowledge *(EXP 3)*	One expert mentioned that industrialization knowledge is something that startups lack but the GHTC has. Industrialization knowledge is related to hardware and includes channels to suppliers and manufacturers as well as knowledge about how to handle them. Further, due to the industrialization knowledge, the GHTC can provide prototype production. Because of the industrialization knowledge, the expert emphasized that a GHTC would be a *great partner* in hardware but not in software. Consequently, the GHTC needs to connect their expertise with what kind of companies they are looking for.
Be located close to customers (EXP 1)	As one expert emphasized, startups need to be located close to their customers. Hence, it can inhibit the startups to be located at the same location as the GHTC. However, it can be a beneficial alternative temporarily if there are specific resources in the building that they need access to. A suggestion is to provide office space at other support institutions.
Flexible and customized offering *(EXP 3, EXP 4, EXP 5)*	Four experts emphasized the need for a flexible and customized offering since the offering depends on the individual characteristics of the startup. Hence, there is a need for the GHTC to understand each startup's needs and challenge. Two of the experts suggested to start from a broad palette of resources and then finding the most valuable resources for the startup.

Clear objectives and expectations *(EXP 2)*	As one expert mentioned, the resources provided to the startup will depend on the objectives of the collaboration from both parties. Hence, it is important to set the objectives and expectations for collaboration beforehand, knowing the challenges related to the lack of alignment and the startups' high likelihood of failure, and longer strategic time perspective, is important.
Adapt services to the startup's needs *(EXP 1)*	The need for the GHTC to adapt to the startup was emphasized. As one expert indicated, it is important that the GHTC does not apply corporate services to the startup but adapt to the startup's needs.
Leverage resources of the GHTC (EXP 2, EXP4)	Two experts indicated that there are assets (e.g. test and prototyping facilities, office space, printers) in the GHTC that have already been invested in, with free capacity which can be used by startups. To provide these resources would be a cost-efficient option for the GHTC.
Enable startup learning *(EXP 1)*	As two experts indicated, providing expertise tend to be more valuable than more hands-on work. One expert explained that the leverage of an hour with an expert is larger than an hour with hands-on job if hours are the scarce resource. Another expert reinforced the need to provide expertise above hands-on work. One expert indicated that education is of significant importance to startup compared to doing the work for them – *to give a person a fish or to teach somebody how to fish.* Further, the interviewee concludes that to work together would be the best way.
Internal champion *(EXP 3, EXP 4)*	Two experts mentioned the need for having a go-to-person within the GHTC, whom the startup can turn to. According to one expert, the go-to-person should be dynamic, willing to listen and have mandate to take decisions and actions. According to another, *few well-connected persons that can make the access to whomever* and *someone who can be the introductory part* is preferable.
USP *(EXP 1)*	Another aspect that was highlighted was the need to find the USP of the GHTC, i.e. elements that cannot be found elsewhere and focus the offering around that.

Appendix E Codebook

Table E.1 below present the codes used in the data analysis process and the description of those. If the code was developed deductively it is based on a concept in theory and if the code is developed inductively it is based on a topic, idea or opinion in the empirical data. For the deductive codes, it is mentioned what theory section in this thesis it derives from. It is also mentioned in the table what perspectives that mentioned the code in the empirical findings.

Table E.1 Descriptions of the codes used in the data analysis process.

Code	Description	Deductive/Inductive	Mentioned by
Align the way of working	Adjust the corporate way of working with startup's way of working, in order to not slow them down, not influence with inertia and bureaucracy. Do not apply large corporation mindset when working with startups. Excluding: assets that are not aligned with startups needs, only related to how they to work	Deductive (3.6.2 Design parameters)	All perspectives
Allocate an internal champion	The GHTC assigns one person from within GHTC that works to ensure benefits for both the company and for the startups, i.e. works like "a bridge" during the program	Deductive (3.6.2 Design parameters)	Startups, Subject matter experts
Avoid steering the startup	The GHTC do not steer or control the startup "too much", do not interfere with startup's decisions e.g. regarding their business, product development or sales	Inductive	All perspectives
Access to the brand	Giving the startups permission to use the GHTC's brand; implications of using the brand e.g. open doors, but also liabilities, demands and limitations	Deductive (3.5.1.1 Startup's Benefit from Engaging with Established Companies)	All perspectives
Coordination of objectives	Set clear expectations and objectives from the beginning from both	Deductive (3.6.2 Design parameters)	All perspectives

and expectations	perspectives; the GHTC should be aware of the startup's needs from the beginning; the GHTC should be aware of their objectives; the GHTC should be upfront on timings and the process		
Customized business development	The GHTC helps startups to develop practical skills related to business development, e.g. management and business skills, to develop business artefacts/ objects vital to develop and sustain business in startups, e.g. business plan and marketing plan; includes learning about the innovation process	Deductive (3.6.1 Resources, Services, and Activities)	All perspectives
Customized development of support functions	The GHTC helps the startup with practicalities required to run the business but is not related to the core product, i.e. administration, marketing, accounting, HR, tech assistance, legal, IP lawyers, certifications	Deductive (3.6.1 Resources, Services, and Activities)	All perspectives
Customized product development (hardware)	Support and advice to develop hardware by internal experts form the GHTC	Deductive (3.6.1 Resources, Services, and Activities)	All perspectives
Customized product development (software)	Support and advice to develop software by internal experts form the GHTC	Deductive (3.6.1 Resources, Services, and Activities)	All perspectives
Depth of collaboration	The GHTC is fully committed and fully engaged, as opposed to a shallow engagement	Inductive	Startups
Degree of customization during the engagement	The degree of customization of the program; the degree of involvement from the GHTC; the degree of bureaucracy involved; tailor made programs	Deductive (3.6.2 Design parameters)	All perspectives
Differences in nature	Understand the startup and the differences in nature between a startup and an established company regarding how functions/activities are performed	Inductive	All perspectives

Equal stake and win-win	Equal stake related to that both parties have equal risk; both parties can gain equal value	Inductive	All perspectives
Evaluations	Follow-up meetings during the program, includes feedback	Deductive (3.6.1 Resources, Services, and Activities)	Startups, Case organization representatives
Financial support: directly from GHTC	The GHTC gives cash to the startup	Deductive (3.6.1 Resources, Services, and Activities)	All perspectives
Financial support: help raise funding from external investors	Help to raise funding from external investors by e.g. giving access to the brand or the startup present the collaboration with the GHTC to investors	Deductive (3.6.1 Resources, Services, and Activities)	All perspectives
How support is provided: Hands-on job	Hands-on work with e.g. certifications, in-depth analysis; work together; free capacity available	Inductive	All perspectives
How support is provided: Learn and develop through expertise	Learn and develop through expertise, i.e. opposite to hands-on job	Inductive	All perspectives
Industrialization support	Expertise and hands-on help to set up a value chain	Deductive (3.6.1 Resources, Services, and Activities: Networking)	All perspectives
IoT-specific and high-technology-specific elements	Access to domain experts, hardware development, skilled IoT resources, help with technical development	Deductive (3.6.1 Resources, Services, and Activities and 3.3.3 Challenges for Startups In the IoT-Sector)	All perspectives
Knowledge about target customer segment	Customer- and market knowledge; access to experts in these areas internally in GHTC	Inductive	Startups, Subject matter experts

Knowledge exchange with internal employees in GHTC	Learnings from being in the same environment as internal employees in the GHTC, no specific learnings but rather "you can always learn something from smart people"	Inductive	All perspectives
Legal issues	Legal issues, when these are solved, how they are solved and the importance of them being solved	Deductive (3.6.2 Design Parameters: Degree of Simplicity of Initiating the Engagement)	All perspectives
Long-term and short-term plans	When something should be provided to startups, in terms of long-term and short-term	Inductive	All perspectives
Market access: distribution channels	Access the market through the GHTC's distribution channels	Deductive (3.6.1 Resources, Services, and Activities)	All perspectives
Market access: access to customer base	Access the market by accessing the GHTC's customer base; includes that the startups get direct access to potential customer, through introductions, networking, workshops	Deductive (3.6.1 Resources, Services, and Activities: Networking)	All perspectives
Market access: GHTC is a customer	The GHTC buys the product from the startup	Deductive (3.6.1 Resources, Services, and Activities)	All perspectives
Market access: labelling the product with the GHTC's brand	Selling product under the brand of the GHTC or co-branding	Partly deductive (3.6.1 Resources, Services, and Activities: market access). The emphasis on labelling is inductive.	All perspectives
Market access: licensing	The GHTC license the technology developed by the startups and incorporate it into the GHTC's products or services	Partly deductive (3.6.1 Resources, Services, and Activities: market access). The	All perspectives

	emphasis on licensing is inductive.		
Market research	Access to market research from the GHTC	Inductive	Startups
Mentoring and coaching	Access to mentors and coaches, internal and external; the relationship with this person and its expertise areas	Deductive (3.6.1 Resources, Services, and Activities)	All perspectives
Networking	Includes access to external networks. Excluding: access to potential customers (included in Market access: access to customer base)	Deductive (3.6.1 Resources, Services, and Activities)	All perspectives
Non-customized program-specific activities and training	Events, workshops, structured training and lectures, demo days	Deductive (3.6.1 Resources, Services, and Activities)	All perspectives
Office space	Offering a place to sit and work, either at the GHTC's office or in another place where the startup would be interested to sit, e.g. other startup support institutions	Deductive (3.6.1 Resources, Services, and Activities)	All perspectives
Portfolio of other participants	The other participants engaging with the GHTC at the same time, the number of these, their industry focus, and if they are co-located	Deductive (3.6.1 Resources, Services, and Activities)	Startups, Subject matter experts
Post-program services	Services and resources that last after the termination of the program	Deductive (3.6.1 Resources, Services, and Activities)	Startups
Present the collaboration	The startup can present the collaboration with a well-known brand, that they have the GHTC as a customer, show to investors	Inductive	All perspectives
Real value for the GHTC	The value that the program brings should be to fulfill a real need in the GHTC and	Inductive	Startups, Subject matter experts

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they should be helped with their real
weaknesses and challenges

Real value for startups	The value that the program brings should be to fulfil a real need in the startup and they should be helped with their real weaknesses and challenges	Inductive	All perspectives
Security development	Help with privacy- and security issues, related to IoT-solutions.	Deductive (3.3.3 Challenges for Startups In the IoT-Sector)	Subject matter experts
Simplicity of initiating the engagement	How complex or simple the process of initiating the engagement is; the startup is not slowed down when initiating the engagement, including application process, business agreement, setting up contracts, and dealing with legal-, IP- and ownership- issues beforehand.	Deductive (3.6.2 Design Parameters)	All perspectives
Streamline processes during engagement	The startup is not slowed down during the engagement due to internal processes and bureaucracy in GHTC	Deductive (3.6.2 Design parameters)	Startups, Subject matter experts
Technology transfer: access GHTC's technologies	The startup get access to the GHTC's technologies	Deductive (3.6.1 Resources, Services, and Activities)	All perspectives
Technology transfer: integrating technologies	The startup and the GHTC integrate each other's technologies	Deductive (3.4.2 Startup Support from Established Companies: Partnerships)	All perspectives
Time horizon	Time horizon of engagement/duration; time to the first gate	Deductive (3.6.2 Design Parameters)	Startups, Subject matter experts
Type of engagement	Business partnerships, accelerator, incubator, projects	Deductive (3.4.2 Startup Support	Startups, Case organization

		from Established Companies)	representatives
USP	The GHTC offers what unique elements, that cannot easily be accessed by other support institutions; the GHTC only offers what they are experts in	Inductive	All perspectives

Appendix F Pre-Study

The questions of the pre-study, with explanations and alternatives, are presented below.

1. What is the preferred geographic location of the startups during the pilot of the program (i.e. the first year of running the program)?
Please indicate the alternative that you find best defines the scope of the location of the startup. Geographic location refers to the physical presence of the startup and its founders. If there are other geographic locations of interest, mention them by choosing "Other" below.

Alternatives: Greater Copenhagen area (Öresundsregionen), Sweden, Nordic countries, Europe, Global, I am indifferent to the geographic location of the startup during the first year, I don't know, Other_____

2. What is the preferred geographic location of the startups when the program is further established?
Please indicate what alternative that you find best defines the scope of the location of the startup. By location, we mean the physical presence of the startup and its founders. If there are other geographic locations of interest, mention them by choosing "Other" below.
Alternatives: Greater Copenhagen area (Öresundsregionen), Sweden, Nordic countries, Europe, Global, I am indifferent to the geographic location of the startup in the long term, I don't know, Other_____.

3. What is the preferred stage of business concept development?
Please indicate what stage of business development the startup should be in when entering the program. Business concept includes market opportunity, offering, business model and go-to-market strategy.

Alternatives: Not defined nor validated, Defined but not validated, Defined and validated, I am indifferent toward how far the startup has come in the business concept development, I don't know.

4. What is the preferred stage of prototype development?

Please indicate what stage of prototype development the startup should be in when entering the program.

Alternatives: No prototype developed, Initial prototype is under development, Minimum Viable Product is fully developed, Product is fully developed, I am indifferent toward what the stage of prototype development is for the startup, I don't know

5. What level of market traction (i.e. revenue from the last 12 months) is preferred?

Please indicate what you find to be the most relevant level of revenue for the startups entering the program.

Alternatives: None (no customers), <1 MSEK, 1-4 MSEK, 5-10 MSEK, 11-50 MSEK, 51+ MSEK, I am indifferent toward whether the startup has gained market traction or not, I don't know

6. What is the preferred (most recent) stage of financing?

Please indicate what you find to be the most relevant recent stage of financing for the startup before entering the program. For example, if a startup's most recent stage of financing is seed capital that indicates that the startup has not yet been through a Series A round of financing.

Alternatives: Pre-seed: Family and Friends/Grants, Seed Capital: e.g. Business Angels, Series A: e.g. Venture Capitalists, Series B, IPO: Public, I am indifferent toward what the most recent stage of financing was for the startup, I don't know.

7. What is the preferred total amount of funding received?

Please indicate what you find to be the most relevant amount of funding raised and received before the startup enters the program.

Alternatives: <1 MSEK, 2-10 MSEK, 11-50 MSEK, 51+ MSEK, I am indifferent toward what the amount of funding received, I don't know.

8. What is the accepted maximum amount of equity lost to external investors?

Please indicate what you think is the accepted amount of equity lost to external investors before the startup enters the program. Please keep in mind that external investors can also be other corporations.

Alternatives: If any equity is taken by external parties, the startup is not considered relevant, 1-10%, 11-20%, 21-40%, 41-60%, 61%+, I am indifferent toward the amount of equity the company has lost to external parties, I don't know.

9. What is preferred previous experience of acceleration programs or incubation programs?

Please indicate what kind of previous experience of acceleration programs and/or incubation you find relevant for the startups to have when entering the program. More than one alternative can be chosen.

Alternatives: startups that have not been accelerated are relevant, startups that have been accelerated in a corporate accelerator are relevant, startups that have been accelerated in an independent accelerator are relevant, startups that have not been incubated are relevant, startups that have been incubated by a corporate incubator, startups that have been incubated in an independent incubator are relevant, I am indifferent toward whether the team has previous experience of incubation or acceleration, I don't know.

10. What is the preferred size of the team?

Please indicate the preferred size of the team, including full-time and part-time employees. More than one alternative can be chosen.

Alternatives: 1-5 team members, 6-10 team members, 11+ team members, I am indifferent regarding the size of the team, I don't know.

11. What is the preferred minimum number of full-time employees?

Please indicate the minimum number of full-time employees you think the team should have when entering the program. More than one alternative can be chosen.

Alternatives: No full-time employees are required, 1-5 full-time employee is required, 6-10 full-time employee is required, 11+ full-time employees are required, I am indifferent toward the number of full-time employees in the team, I don't know.

12. What is the preferred diversity of the team?

Please indicate what type of diversity you find important for the teams, participating in the program, to possess. If there is some aspect of diversity that you think is missing, please add this yourself as "Other" below.

Alternatives: Gender diversity in team (i.e. at least one male and one female member of the team), Nationality diversity in team (i.e. team members are from at

least two different countries), I am indifferent regarding the diversity of the team, I don't know, Other:_____.

13. When entering the program, what competences should not already be outsourced?
Please indicate what competences you find to be the most important for the core team to possess in-house before entering the program. For example, if the software development of the core product/business is outsourced this implies that someone outside of the company is responsible for this.

Alternatives: Software development related to core business, Software development related to non-core business, Hardware development related to core business, Hardware development related to non-core business, I am indifferent toward what competences the team possesses and what is outsourced as long as they can find a way to move development forward, I don't know.

14. Additional criteria of relevance?

15. Prioritize criteria (maximum five criteria)
Please mark the highest prioritized criteria, based on the criteria above. Please choose a maximum of five criteria.

16. Is there anything that would be a "deal breaker" causing the global high-technology not to collaborate with a startup?
Please indicate if there are any criteria that would cause the global high-technology company to not collaborate with a startup.

Any comments about your responses or the survey in general?