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Increasing the chances of successful market entry through customer co-creation partnerships with client firms in a B2B domain: A guide for nascent entrepreneurs

A multiple-case study on how entrepreneurs implement customer co-creation partnerships with client firms within the NPD process of their B2B start-up

Sala, M.

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Increasing the chances of successful market entry through customer co-creation partnerships with client firms in a B2B domain: A guide for nascent entrepreneurs

A multiple-case study on how entrepreneurs implement customer co-creation partnerships with client firms within the NPD process of their B2B start-up

A master thesis by M. Sala

Student identity number 1012048

1st supervisor: Dr. A.S.A. Bobelyn

2nd supervisor: Dr. A. Markus

3rd supervisor: prof. dr. ir. I.M.M.J. Reymen

Department of Industrial Engineering & Innovation Sciences
Innovation, Technology, Entrepreneurship & Marketing (ITEM)

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Marcello Sala

Eindhoven, April 2022

Management summary

Introduction

Staying innovative is one of the most important tasks an organization has if it wants to survive in competitive markets (Benner and Tushman, 2003; March, 1991). Many B2B start-ups try to enter these competitive markets by developing disruptive innovations (Lim, Bentley, and Ishiwaka, 2020). When working on these disruptive innovations entrepreneurs often deal with immature technologies, unexplored design opportunities, uncertain environments, and undiscovered customer needs. This is why closely involving their business customers throughout the NPD process, also known as the customer co-creation approach, is vital for B2B start-ups. This customer co-creation approach is defined as an active, creative, and social collaboration between customers and producers, facilitated by the producing company. Through this collaboration, the customer becomes an active participant in the new product development process of an innovation that is produced by the start-up facilitating the partnership (Piller, Ihl, and Vossen, 2011).

The topic of customer co-creation as a whole is widely researched. However, existing research is mostly limited to describing the theory in a philosophical way and is therefore too vague and imprecise for nascent entrepreneurs with a lack of knowledge of the NPD process to translate to the exploratory activities of their start-up (Björk, Ljungblad, and Bosch, 2013; Castro et al., 2017; D'Andrea et al., 2019). Additionally, current research mostly focuses on established companies that involve (a group of) customers in the NPD process of innovations in the business-to-consumer domain (Newbert, Tornikoski, and Augugliaro, 2020). Research on co-creation collaborations between a B2B start-up and their business customer is almost non-existent (Hein et al., 2019; Usman and Vanhaverbeke, 2017). To address the theoretical and empirical gap, this multiple-case study was performed. This research provides its readers with an understandable and helpful overview of the process and effects of customer co-creation, a deep understanding of how B2B start-ups use this approach in their exploratory activities with business customers, and actionable knowledge for nascent entrepreneurs that want to facilitate a customer co-creation partnership within their B2B start-up. This resulted in the following main research question:

How can nascent entrepreneurs facilitate a successful customer co-creation collaboration within the NPD activities of their B2B start-up?

Scientific background

Klotins et al. (2019) studied the shortcomings in the involvement of business customers in the development process by B2B start-ups. This research found that 100% of failed start-ups and 29% of start-ups that are still in operation, reported that they involved their business customers too late in the development process. This leads to the development of new products that do not fill customer needs and do not fit customer wants and therefore are unwanted by the customers (Lim, Bentley, and Ishiwaka, 2020).

To better understand the customer, start-ups should closely involve them in the development of the innovation. This close involvement of client firms can minimize the failure rate of products, strengthen potential financial performance and be hugely beneficial in identifying latent, unknown needs, new market opportunities, and underlying values and behaviors (Johnson, 1998; McCormack, et al., 2012; O'Hern and Rindfleisch, 2017; Trott, 2001; Verma et al., 2008; Witell et al., 2011). Additionally, products that are developed together with customers lead to a more positive evaluation, higher perceived quality, higher customer satisfaction, and higher customer loyalty (Neves and Xavier, 2017). Start-ups

often miss experience in NPD activities, market and customer knowledge, and a relevant social network and are bound to their liability of newness and smallness, which makes it harder to access relevant resources (Björk, Ljungblad, and Bosch, 2013; Lim, Bentley, and Ishiwaka, 2020; Usman and Vanhaverbeke, 2017). A collaboration with a business customer who has extensive experience, a high level of domain knowledge, and an elaborate network in the relevant domain could help to overcome this challenge.

Creating a high level of mutual trust between the representatives of the B2B start-up and the business customer is vital when aiming for a successful collaboration. This is achieved by having a shared goal and understanding in the collaboration and by proper communication throughout the NPD process (Grafmüller, 2020). Research by Grafmüller (2020) also states that openness from the start-up to the business customer is crucial in building trust with the co-creation partner. This includes stressing the importance of open collaboration, in which the business customer has insight into the new product development trajectory (Laage-Hellman, Lind, and Perna, 2014). Next to this, showing the customer a demonstration of expertise is also an effective way to reduce customer worry and increase trust (Prior, 2013). Finally, projecting a realistic picture of the co-creation partnership and the potential outcomes is advised. The developer should emphasize that certain conditions might not be met and that the whole customer co-creation process should be seen as a joint learning process (Haas, Snehota, and Corsaro, 2012).

For a start-up working on an innovation, the most suitable co-creation partners can be classified as the 'innovators' from the 'Diffusion of Innovation' theory. These 'innovators' are open to new ideas, risk-taking, knowledgeable, adventurous, and imaginative and are ahead of the market regarding wants, needs, and adoption behavior (Morrison, Roberts, and Midgley, 2004; Rogers, 1995; Orcik and Anisic, 2014). These co-creation partners should preferably be driven by either an intrinsic interest in the innovation or because of an unsatisfied need since both are very committed to the new product and its future application.

Methodology

Because of the exploratory nature of the research question, the need for a deep understanding and actionable knowledge, and the fact that extensive existing research on customer co-creation collaborations between B2B start-ups and their customers is lacking, a multiple-case study was used (Creswell et al., 2007). The case study method consists of a comprehensive exploration from different perspectives of the complexity and uniqueness of a certain topic, with the intention to construct a 'telling case' that can lead to new hypotheses, theories, and concepts that can be used in situations with similar conditions (Roberts et al., 2004; Simons, 2009; Yin, 2018). This fits nicely with the aim of this paper of forming an overview of different experiences and perspectives regarding the use of customer co-creation as a new product development approach, and providing the reader with elaborate examples and actionable knowledge on customer co-creation within B2B start-ups which entrepreneurs can use when facilitating their co-creation partnerships.

The unit of analysis for this research, the co-creation partnership between a B2B start-up and their business customer and the implementation of this collaboration in the NPD process of the start-up, was investigated by examining multiple of these collaborative relationships. Based on inclusion and exclusion criteria, six start-ups were selected to be incorporated in this paper as case studies by having semi-structured interviews with their founders and/or managers. In combination with two first-hand cases, in which observational data was gathered and a semi-structured interview with the customer co-creation partner was conducted, the total number of cases used in this research is eight. To prepare for the semi-structured interviews, an interview protocol was set up based on the findings from existing literature. The interview protocol was used as a checklist to ensure the important points were discussed

during the interview. The interviews themselves were open conversations, in which the interviewer sparked the discussions by asking open-ended questions and follow-up questions if necessary and suitable. Also, additional time was reserved to discuss topics outside of the scope of the research or related aspects that were not foreseen to get a complete overview of the whole process that these start-ups went through together with their co-creation partner. The template approach and Gioia approach were used to construct the data structure that will be used for coding the obtained qualitative data. The confidentiality and anonymity that are connected to these interviews were secured by making use of confidential appendices. Also, the research validity and reliability were deemed as important to watch over the scientific accuracy of this paper.

Results and discussion

The findings from the obtained qualitative data were discussed in a within-case analysis for each of the cases. These gave a good insight into how the facilitating start-up managed the collaboration through all phases of the NPD process. To find overlapping characteristics between the case partnerships a cross-case analysis was performed. This gave a good overview of the similarities and differences between all the researched collaborations. These analyses resulted in a range of interesting theoretical contributions and practical implications. The theoretical contributions will be shared first:

- Existing research mentioned that companies often lack explicit goals and selection criteria when looking for a co-creation partner and that the reasons why organizations decide to collaborate are unclear (D'Andrea et al., 2019; Jouny-Rivier, Reynoso, and Edvardsson, 2017). This thesis found that the most important considerations for a B2B start-up to start a collaboration with their business customer are the relevant network, the domain and end-user knowledge, and the track record of the customer, as well as the validation that the partnerships brings to the market.
- Franklin and Marshall (2019) identified mutual trust as the foundation of a co-creation collaboration. This thesis confirmed this for the context of B2B start-ups. It was found that a high level of mutual trust positively affects the commitment of the business customer in the collaboration, increases the openness and willingness to share information, lowers the barrier to contact one another, and decreases the need for formal contracts between the partners.
- It was found that face-to-face meetings and a stable point of contact could, among others, increase the personal relationship of the collaborators, improve the shared understanding of the innovation, prevent miscommunication, increase the openness and willingness to share information, and improve the commitment to the partnership. This is in line with earlier research on customer co-creation (Aarikka-Stenroos and Jaakkola, 2012; Grafmüller, 2020; Wildenbos, Jaspers, and Peute, 2019).
- This thesis concluded that entrepreneurs with previous business experience paid more attention to achieving mutual alignment than nascent entrepreneurs. It was also seen that experienced entrepreneurs used a more structured approach to customer co-creation. This contradicts the findings by Frow et al. (2015) that stated that most managers from established companies mentioned that their firm lacks a structured approach for the identification and implementation of customer co-creation activities.

The goal of this thesis was to provide nascent entrepreneurs with an in-depth insight into the implementation of customer co-creation partnerships as a B2B start-up and provide them with elaborate examples and actionable knowledge on this topic. This resulted in a range of practical implications that could help nascent entrepreneurs in facilitating a co-creation collaboration with their business customer:

- The facilitating entrepreneur should pay attention to building mutual trust. This mutual trust can improve the openness and willingness to share information, lower the barrier to lay contact, improve the shared understanding of the innovation and decrease information asymmetry

throughout the NPD process, and lower the need for time-consuming and costly formal contracts. This mutual trust can be achieved by the entrepreneur by building a personal relationship with the business customer, creating mutual alignment, and by being open about, and giving insight into, the collaboration process throughout the whole collaboration.

- Previous experience in NPD activities by the facilitator of the collaboration shows to affect the implementation of the co-creation process. Nascent entrepreneurs should therefore question whether they are ready to facilitate their own co-creation partnership with a business customer, or whether they should hire an external experienced facilitator to support or lead the B2B customer co-creation process.
- The entrepreneur should search for a co-creation partner with innovator or lead user characteristics. This business customer should be open to new ideas, risk-taking, and imaginative and should preferably experience the need or problem ahead of the market. Additionally, the client firm should have a relevant network, high domain and end-user knowledge, and a good track record. Preferably, the driver of motivation for the business customer should either be an intrinsic interest in the innovation or an unmet need that is experienced.
- The organization with the most knowledge of the experienced need, the requirements, and the abilities of the end-user should be leading in important design decisions. In most situations, this organization will be the customer co-creation partner, who is often also the end-user.
- Entrepreneurs should take advantage of the validation that a customer co-creation collaboration can bring to the market for the developed innovation and also the start-up as a whole. Additionally, the network and brand of the business customer can also be used as a marketing instrument by the collaborators to create exposure and awareness for the developed innovation to a broader audience than only the direct competitors of the co-creation partner.

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1. Introduction

As a company, it is important to constantly be engaged in exploratory activities, such as the search for new knowledge and the development of new products. Staying innovative is one of the most important tasks an organization has if it wants to survive in competitive markets (Benner and Tushman, 2003; March, 1991). An effective method to achieve this is by aiming for the development of innovations that disrupt the market. Business-to-business (B2B) start-ups, which are the focus of this research, often want to develop these disruptive innovations (Lim, Bentley, and Ishiwaka, 2020). These B2B start-ups frequently work with immature technologies, unexplored design opportunities, uncertain environments, and undiscovered customer needs. Closely involving their business customers in the new product development (NPD) process is therefore especially important for these start-ups because this can minimize the failure rate of products, strengthen potential financial performance and be hugely beneficial in discovering the largely unknown customer needs (McCormack, et al., 2012; O'Hern and Rindfleisch, 2017). Additionally, for most start-ups, the first product that they release to the market is the 'make or break' moment for the future of the start-up. Since products that are developed together with customers lead to a more positive evaluation, higher perceived quality, higher customer satisfaction, and higher customer loyalty, start-ups should seriously consider the close collaboration with customers in their NPD activities (Neves and Xavier, 2017). This active involvement of the customer through all phases of new product development is often referred to as customer co-creation. Despite all these known advantages, a recent study by Klotins et al. (2019) researched the shortcomings in the involvement of business customers by B2B start-ups in the development process and found that 100% of failed start-ups and 29% of start-ups that are still in operation reported that they involved their business customers too late in the development process. This leads to the development of new products that do not fill customer needs and do not fit customer wants and therefore are unwanted by the customers (Lim, Bentley, and Ishiwaka, 2020). This inability to address the demands and needs of customers is a leading cause of the high failure rate of new products (Gourville, 2006; Ryyänen and Hakatie, 2014; Sachdev, 2001; Victory et al., 2021). Next to this, research from Khanagha, Volberda, and Oshri (2017) has found that the involvement of customers in the NPD journey can act as leverage that leads to breakthrough innovations because the indirect effects of closeness to the customer are crucial in understanding market shifts. This can be an additional reason for B2B start-ups to co-create innovations with business customers since these breakthrough innovations are exactly what most of these start-ups are looking for. Björk, Ljungblad, and Bosch (2013) even report that only one out of 58 start-ups succeeds. They report that this is for a big part due to the way the start-ups are typically run, their lack of experience in new product development (NPD) activities, and the high uncertainty in the environments they work in.

The Marketing Science Institute is also extremely interested in the subject of customer co-creation, which is why they identified '*Should customers be involved in the co-creation of product and content and, if so, how?*' as a top research priority (Marketing Science Institute, 2020). A term that is also regularly seen as a synonym for customer co-creation is co-design. Co-creation, which can refer to any act of collective creativity, can also be used outside of product or service development-related activities. This is why co-design is also regularly used in literature regarding the involvement of customers in development processes (Sanders and Stappers, 2008). These terms are seen as similar in this paper and might also be used interchangeably.

1.1 Gap Identification

Customer co-creation is currently a widely researched topic. However, this research mostly focuses on established companies that involve (a group of) customers in the NPD process of innovations in the business-to-consumer domain (Newbert, Tornikoski, and Augugliaro, 2020). Research on co-creation collaborations with a business customer in a business-to-business domain is sparse (Hein et al., 2019). There is existing research available on the involvement of customers by start-ups, with the Lean Startup approach by Ries (2011) as possibly the most famous one. This Lean Startup approach is adopted by business schools, accelerators, and incubators all over the world. However, Newbert, Tornikoski, and Augugliaro (2020) argue that theoretical and empirical evidence on the effectiveness of this approach is still needed. Additionally, while there is some research on the implementation of the Lean Startup approach by existing start-ups, there is a gap on the specific role that the customer involvement plays in the development of innovations by start-ups that apply this approach (Mansoori, 2017; Newbert, Tornikoski and Augugliaro, 2020). When looking specifically at existing literature on NPD collaborations between a B2B start-up and a client firm, research from the point of view of the start-up is almost non-existent (Usman and Vanhaverbeke, 2017). This is remarkable since the correct involvement of business customers throughout the design processes is particularly important for B2B start-ups, who often work in unknown and uncertain environments. When looking at the literature on overall B2B customer co-creation, it is seen that research is also lacking in details on why organizations decide to collaborate with their customers (Jouny-Rivier, Reynoso, and Edvardsson, 2017). Research from D'Andrea et al. (2019) confirms this by stating that companies often lack explicit goals and partner selection criteria at the start of the project. They argue that companies should aim for partners that are collaborative and have strong domain knowledge.

Research on customer co-creation as a whole is also still relatively young. This makes that many aspects of this phenomenon are not researched empirically and are barely understood theoretically. Most current co-creation activities are therefore characterized by never-ending and unstructured development projects and trial-and-error in which the company manager struggles to delineate a typical co-creation process (Hoyer et al., 2010; Grafmüller, 2020). Existing literature is mostly limited to describing the theory in a philosophical way. The research is often too vague and imprecise to be implemented in real-life situations since practical information on how and when to use this co-design method is lacking. For starting entrepreneurs with a lack of knowledge of the NPD process, most existing research is therefore hard to translate to the exploratory activities of their start-up (Björk, Ljungblad, and Bosch, 2013; Castro et al., 2017; D'Andrea et al., 2019). Research by Galvagno and Dalli (2014) even found that 85 percent of all research on co-creation is purely theoretical. Given the huge potential upsides to facilitating a co-design collaboration with a business customer, combined with the lack of knowledge of starting entrepreneurs and the flexibility that start-ups have in forming their internal and external processes, an overview of the customer co-creation approach and guidance on how and when to implement this in practice could be interesting for starting business owners. Since this information is almost non-existent from the perspective of a B2B start-up this research aims to provide its readers with an understandable and helpful overview of the processes and effects of customer co-creation as a new product development method and gives a deep understanding on how B2B start-ups use this approach in their exploratory activities with business customers. To achieve this deep understanding, a multiple-case study was performed in which co-creation collaborations between B2B start-ups and business customers were analyzed. This multiple-case study resulted in actionable knowledge and elaborate examples for the readers of this paper to address the existing theoretical and empirical gap.

1.2 Research Objective & Questions

This research gives a deep understanding on the concept of customer co-creation in a B2B setting and how co-creation partnerships with a business customer can contribute to the new product development processes within start-ups. A multiple-case study was performed to increase the understanding of how B2B start-ups facilitate their past and current co-design partnerships with business customers and how this influences the explorative activities of the start-up. This has led to the following main research question:

How can nascent entrepreneurs facilitate a successful customer co-creation collaboration within the NPD activities of their B2B start-up?

To answer this research question, multiple sub-questions were constructed. First of all, when learning how start-ups can properly facilitate an effective customer co-creation collaboration it is first interesting to know what existing literature says about the problems that arise with more traditional new product development approaches in which the customer involvement is much less intensive. This resulted in the first sub-question:

Which difficulties do organizations experience with traditional new product development approaches in their exploratory activities?

Additionally, it was interesting to focus on what existing literature stated on the topic of customer co-creation and its implementation in the NPD process. This information was also used as input for the interview protocol for the multiple-case study. This has led to the following sub-question:

What is customer co-creation, and how can it be implemented in the NPD process?

The selection of the right co-design partner is an important element of achieving a successful collaboration. As described earlier, the research of D'Andrea et al. (2019) and Jouny-Rivier, Reynoso, and Edvardsson (2017) mention that details on the selection criteria which organizations use to find the right customer co-creation partner are lacking in the area of B2B customer co-creation. This is why both in the literature review as well as the multiple-case study, attention was paid to the following sub-question:

How can a B2B start-up select the right customer co-creation partner?

The multiple-case study will also investigate how a range of nascent entrepreneurs managed the customer co-creation collaboration within their B2B start-up, leading to the final sub-question:

How do B2B start-ups set up and manage customer co-creation collaborations?

By answering this research question and these sub-questions, this paper provides the reader with an extensive insight and understanding of the phenomenon of customer co-creation and how this is currently used by B2B start-ups. This led to elaborate examples and actionable knowledge that nascent entrepreneurs can use to facilitate an effective customer co-creation collaboration within their B2B start-up.

2. Scientific Background

The introduction and gap analysis of this thesis made clear that existing literature research on customer co-creation when it regards B2B start-ups as well as empirical research on customer co-creation is limited. However, there is a large body of theoretical research available on customer co-creation as an approach when used by more established companies in both B2B and B2C settings and other customer involvement methods that are often used during NPD processes. A large part of this existing research, for example, the main strong and weak points of this approach and the communication with the participants, could also apply to the situation of nascent entrepreneurs who are looking to closely involve customers in the development process of their innovation. This scientific background functioned as a foundation on which the interview protocol and part of the data structure were based. Furthermore, the findings from this literature review were compared to the findings from the multiple-case study, which can also indicate if there are clear contradictions or similarities between start-ups and established companies regarding the implementation of the approach of customer co-creation in the NPD process.

2.1 Traditional new product development methods

The creation of new products and their launch on the market is the most vital and challenging task that a manager has. To have a competitive advantage over the competition, the new product must be harmonious with the voice of the customer, while at the same time be manufactured within budget, have perceived technological superiority, and be launched earlier than the products of competitors. Even for experienced managers, this is easier said than done. By mastering their skills and competencies throughout the whole NPD process, managers can increase the success rate of their new products (Tzokas, Hultink, and Hart, 2004). Despite this, the reality is that only a small part of new products succeed in the market (Gourville, 2006; Sachdev, 2001; Victory et al., 2021). This suggests that the success rate of new products by nascent entrepreneurs with a lack of theoretical knowledge and practical experience will be even worse. This high failure rate also directly impacts the performance of these organizations. Cooper (2006) found that the resources that are allocated to the development of failed products are estimated to be half of all resources that are assigned to new product development activities. For start-ups, this could result in the bankruptcy of the company. Next to this, a survey by The Boston Consulting Group revealed that less than 48% of managers are satisfied with the returns that are generated from their exploratory activities (Andrew et al., 2009). According to Ogawa and Piller (2006), the main reason for these high failure rates is the lack of understanding of customer needs. Klotins et al. (2019) studied the shortcomings in the involvement of business customers in the development process by B2B start-ups. This research found that 100% of failed start-ups and 29% of start-ups that are still in operation, reported that they involved their business customers too late in the development process. This leads to the development of new products that do not fill customer needs and do not fit customer wants and therefore are unwanted by the customers (Lim, Bentley, and Ishiwaka, 2020). A reason for this might be that NPD is often seen and performed as an activity that is internal and firm-centered, without the involvement of other stakeholders. Von Hippel (2005, p. 19) even stated that this view on new product development is “deeply ingrained in both traditional expectations and scholarship”. A great body of research already found that timely and reliable information about customer needs and wants is the most vital for successful product development. Many companies invest heavily in traditional market researches techniques, such as focus groups, interviews, or surveys, but these methods are not reliable, lack realism, and will not provide companies with the detailed information that is needed to find the latent customer needs, especially when there is aimed for radical innovation (Ogawa and Piller, 2006). Additionally, research by Im and Workman (2004) found that

both market and customer orientation are driving forces of the success of new products. For start-ups, this is a difficult task, since they often lack the experience and knowledge in this field. Especially because start-ups that work with radical innovations operate in markets in which the customer needs are largely unknown (MacCormack et al., 2012). The survival of new ventures is also closely related to the knowledge entrepreneurs gain over the process of building their start-ups. This is existing literature describes successful entrepreneurs as ‘exceptional learners’ (Newbert, Tornikoski, and Augugliaro, 2020). If nascent entrepreneurs have more knowledge of the common difficulties of building a start-up and the corresponding NPD activities and can mitigate these pitfalls, the success rate of start-ups can be drastically improved (Stayton, 2015).

Another widely accepted view on why new products fail is based on the research of Gourville (2006). This research covers the psychological costs that are connected to behavior change of the customer. According to Gourville, customers overvalue the benefits of the product that they are using and undervalue the benefits of newly developed products. Next to this, the disadvantages of the new product are also overvalued by customers who use an existing alternative. This results in the belief that customers overvalue the characteristics of the existing product by a factor of 3. On the other hand, companies also tend to overweight their new product. The managers and engineers who worked on their projects for years are convinced about the advantages and effectiveness of their new invention. In reality, this also leads to an overvaluation from the developers of the new product by a factor of 3. This combined leads to Gourville’s ‘9x effect’, in which the difference in valuation of the product between the developers and the customer differs by a factor of 9. This mismatch between what innovators believe the customers desire and what customers actually want has to be resolved to mitigate the negative consequences of this ‘9x effect’ (Gourville, 2006).

The above-mentioned bottlenecks and uncertainties could partially be mitigated in the development of B2B products and services by using a customer co-creation approach, in which the co-creation partner is selected carefully. D’Andrea et al. (2019) mentioned that setting specific goals and selection criteria at the start of the project to find a business customer that is collaborative and has strong domain knowledge, results in a more effective NPD process.

2.2 Customer co-creation partnership

To better understand customer wants and needs, which is vital for successful product development, methods in which customers are actively involved in new product development processes become increasingly popular among companies, since the more traditional approaches in which customers are seen solely as buyers no longer achieve the desired goal (Hoyer et al., 2010; O’Hern and Rindfleisch, 2017; Perttunen et al., 2021; von Hippel, 2005). Despite the acknowledged importance of the involvement of customers in NPD processes, there is no clear consensus on a definition of customer co-creation across existing literature. Some sources state that every interaction of customers with the innovation can be classified as co-creation, whereas others argue that co-creation is a process in which customers and the developing organizations work actively together to come to satisfying solutions (D’Andrea et al., 2019). The definition of customer co-creation by Piller, Ihl, and Vossen (2011) is that of an active, creative and social collaboration between customers and producers, facilitated by the producing company. Through this collaboration, the customer becomes an active participant in the new product development process of an innovation that is produced by the facilitating company of this partnership. This definition emphasizes that this co-creation collaboration is a long-term partnership through one or multiple phases of the NPD process. Since this research focuses on customer co-creation partnerships, rather than one-time involvement of customers in the development, this is also the definition that will be followed throughout this research.

Working closely together in the NPD process through a co-creation collaboration with a business customer could be more valuable for start-ups than for more established development companies. Firms that have extensive innovation capabilities within the organization, such as a highly funded research and development department, are less dependent to commit to a partnership with a client firm. However, start-ups often lack the needed capabilities in some phases of NPD. Start-ups often miss the experience in NPD activities, market and customer knowledge, and a relevant social network (Björk, Ljungblad, and Bosch, 2013; Lim, Bentley, and Ishiwaka, 2020). When leading an innovative start-up through its first NPD trajectory, an entrepreneur has to make important decisions based on too little information all the time. Therefore, it is important to discover the little information that is available in the uncertain and unexplored environments these young businesses operate in. However, start-ups are bound to their liability of newness and smallness, which makes it harder to access relevant resources (Usman and Vanhaverbeke, 2017). This is why starting businesses often make the step to collaborate with a business customer which has extensive experience, a high level of domain knowledge, and an elaborate network in that relevant domain. Additionally, it is also seen that specialized companies, which start-ups mostly are, are more eager to co-create than diversified companies. Specialized businesses may be interested in customer co-creation because it shows a different perspective on their day-to-day activities, gives the opportunity to iteratively ask for immediate feedback on prototypes and concepts, and quickly identify and solve issues (Jouny-Rivier, Reynoso, and Edvardsson, 2017). Research by Goyal, Ahuja, and Kankanhalli (2020) also found that start-ups are more open to new ideas, and more willing to change their business model and take risks. This also results in the fact that start-ups are a significant source of breakthrough innovation (Usman and Vanhaverbeke, 2017). As mentioned earlier, involving customers throughout the NPD process can act as leverage to increase the chances of breakthrough innovations even more (Khanagha, Volberda, and Oshri, 2017). Because of this combination of lack of domain knowledge and high flexibility in both the innovation and business model that can lead to groundbreaking innovations from the side of the B2B start-up, a partnership with an experienced business customer with an unmet need could be hugely beneficial for both parties.

This high interactivity between the customer and the development company creates a more equal level of importance between those two stakeholders in the new product development process. However, it is still the responsibility of the facilitating manager to make sure that the co-creation process is properly executed to ensure its effectiveness and efficiency. The accurate implementation of such co-creation activities is therefore often seen as a decisive success factor (Grafmüller, 2020). Despite this, Frow et al. (2015) found that most managers, even though they have an interest in co-creation and its potential benefits, mention that their company lacks a structured approach to identifying and managing co-creation opportunities. The facilitating manager therefore has the difficult task to find the right balance between sticking to a structured approach and keeping the flexibility that is needed to remain a high level of adaptability and innovativeness during the development process.

Jouny-Rivier, Reynoso, and Edvardsson (2017) found a positive relationship between the commitment of a firm to co-create with B2B customers and, among others, the organization's market orientation and the perceived benefits of the innovation. Additionally, research from Witell et al. (2011) mentioned that inviting customers to use their own initiative rather than having the customer react to prepared questions or instructions, which is mostly the case in more traditional research methods, provides new opportunities for firms to increase the customer value in their new market offerings. A huge difference between traditional market research methods and customer-driven research methods is the type of needs that are spotlighted. With the traditional methods, the needs that are revealed are often 'surface needs', which are clearly visible in the current situation. The reason for this is because those methods, like surveys, in-depth interviews, and focus groups, pay attention to capturing the previous experiences of customers and are therefore seen as reactive and backward-looking, which are not helpful in predicting the future. Additionally, these interactions are well prepared by the organization and often limit the freedom of participants to give new insights and thoughts that are outside of the scope of the prepared guide or survey. However, for developing innovations the identification of latent, unknown needs and

new market opportunities is a lot more valuable and usable. Therefore, more forward-looking customer-driven research techniques with a focus on freedom and room for imagination by the customer are much more beneficial when trying to find underlying values, behaviors, and needs (Johnson, 1998; Trott, 2001; Verma et al., 2008; Witell et al., 2011). Research from Lusch, Vargo, and O'Brien (2007) also states that, to renew offered services, an organization has to stay up-to-date on market trends and new knowledge. They argue that the customer has a huge role in this and that organizations should therefore move away from the thought that a customer is solely a source of information, but rather see them as an active developer in exploratory activities with their own knowledge and skills. Kristensson, Gustafsson, and Archer (2004) even suggest that regular customers are often more capable of generating ideas than the research and development employees of an organization, since the customers develop ideas for their own situation, whereas R&D employees develop ideas for others. Because the customers themselves are better aware of their demands and requirements, they might create more valuable concepts than employees with a lot more experience in ideation activities. If forward-looking customer-driven needs assessment tools are used to bring those latent wants and needs to the surface and clearly expressed by the potential end-users to the new product development professionals, the customer fit of innovations and therefore new product success rate might be increased.

The effectiveness of this view is backed by research, including that of Lilien et al. (2002). This paper concluded that innovations that were generated by using the lead user approach, in which the user is the driving force behind the new development, resulted in higher profits than new products or services that were developed with more traditional NPD methods. A wide body of literature also confirms that intensive communication with the customer throughout the development process is one of the most important determinants of new product success (Gruner and Homburg, 2000). Gruner and Homburg (2000) also found that the effect of these interactions are mostly present in the early and late stages of new product development, and no impact on new product success was seen when communicating in the medium stages of development. This suggests that the involvement of the customer in the ideation and validation phase contributes to new product success, and that involvement in the development phase is less effective. This makes sense, since the ideation and validation phases are the ones that have the most influence on the eventual outcome of the project and fewer alterations to the innovation can be done during the development phase.

Another factor to keep in mind is that, when working with radical innovations, the technology newness and/or market newness of the product can be very high. Research from Feng et al. (2016) states that customer involvement has a positive influence on new product performance, but that this effect is moderated by technology and market newness. They found that customer involvement had the greatest positive effect on new product performance when the market newness of the product was high, and the technology newness of the product was low. This may be explained by the fact that customers are often resistant to unknown and radical innovations (Joachim, Spieth, and Heidenreich, 2018). However, other research also suggests that a high level of market newness makes it harder to extract customer information during a co-creation process. The reason behind this is that high market newness requires the developers to uncover latent needs, and customers are often not good at articulating these latent needs through traditional need assessment methods (Wang et al., 2020). This could be overcome by selecting customers that are more open to the development of new products and have a high level of domain knowledge, such as lead users or innovators. These different types of customers that can be involved in the development processes will be discussed in the section '*Customer types*', but this research will first elaborate on specific factors within customer co-creation that are, according to existing literature, essential for successfully facilitating an active collaboration.

2.2.1 Mutual trust

Achieving mutual trust and openness between the company facilitating the co-creation trajectory and the customer taking part in the collaboration is key to achieving new product success. During all steps of a co-creation collaboration attention must be paid to achieve this mutual trust, since that is the foundation of the collaboration (Franklin and Marshall, 2019). The reason for this is because the presence of this trust positively influences many key factors that turn a partnership into a successful one. The facilitating start-up needs the customer to open up on their precise requirements and provide a detailed picture of their current situation and its limitations as well as their preferred future situation and the thresholds that come with that. Moreover, when regarding complex innovations, the customer will most likely not be able to comprehend every detail of the whole co-creation process. If this is the situation, it is important that the customer has trust in the abilities and intentions of the development company. An additional bottleneck that comes with this in a B2B customer co-creation setting, is that the co-creation partner might not disclose all information because of the fear of revealing their own customers and ideas (Grafmüller, 2020). In the existing literature, multiple ways of building a trustful relationship with a co-creation partner are discussed.

Creating mutual alignment contributes to building that mutual trust. This is achieved by having a shared goal and understanding in the collaboration and by proper communication throughout the NPD process (Grafmüller, 2020). Both of these aspects will be further elaborated upon later in this paper. Research by Grafmüller (2020) also states that openness from the start-up to the business customer is crucial in building trust with the co-creation partner. This includes stressing the importance of open collaboration, in which the customer has insight into the new product development trajectory. Being open in sharing knowledge or showing the willingness to do so from the start of the project, and encouraging the customer to do the same, positively contributes to building this mutual trust (Laage-Hellman, Lind, and Perna, 2014). Next to this, showing the customer a demonstration of expertise is also an effective way to reduce customer worry and increase trust (Prior, 2013). Finally, projecting a realistic picture of the co-creation partnership and the potential outcomes is advised. The developer should emphasize that certain conditions might not be met and that the whole customer co-creation process should be seen as a joint learning process (Haas, Snehota, and Corsaro, 2012).

2.2.2 Commitment through mutual alignment

Earlier in this research, it was already discussed that a start-up should set specific goals and selection criteria at the start of the project to find a co-creation partner that is collaborative and has strong domain knowledge since that results in a more effective NPD process (D'Andrea et al., 2019). Additionally, to ensure commitment to the collaborative partnership, creating mutual alignment between the facilitating start-up and the business customer on the goals and understanding of the process at the start of the collaboration is crucial. This mutual alignment positively influences the effectiveness and quality of the design process. On the other hand, a lack of shared understanding results in additional unnecessary iterative loops and increases the possibility that not all problems are solved when the product is finalized (Kleinsmann and Valkenburg, 2008). Clear identification of the goals of each party and how they overlap in the collaboration, as well as a distribution of tasks beforehand, limits the perceived sacrifice both the start-up and the business customer experience (Jouny-Rivier, Reynoso, and Edvardsson, 2017). One of the most effective ways to achieve mutual alignment is by paying attention to the type of communication that is done during the collaboration. This will be discussed in further detail in the next section.

Achieving shared understanding and goals at the start of the project contributes to creating commitment from both parties to the collaboration. This commitment can assure a successful inter-organizational relationship between the start-up and business customer, according to Heffernan (2004), since this makes that both parties are willing to invest in the relationship and can rely on each other to perform required tasks. Additionally, it can also reduce the uncertainty about the future, since both stakeholders carry out that they are in this partnership for a longer timeframe (Jouny-Rivier, Reynoso, and Edvardsson, 2017). Jouny-Rivier, Reynoso, and Edvardsson (2017) also found a clear positive relationship between the perceived benefits of a co-created innovation and the commitment of an organization to initiate co-design partnerships with B2B customers. However, then the business customer still has to be convinced to participate in the collaboration. Business customers will not commit to a co-design project unless the benefits and sacrifices that apply to the customer are clearly identified at the start of the trajectory. The roles of both partners, as well as the goals and objectives, required skills, and financial resources of the project, must be clear to make sure that both parties are aware of the benefits and sacrifices of the co-creation relationship. Also, continued clear communication contributes to building and maintaining a commitment to the collaboration from both sides (Jouny-Rivier, Reynoso, and Edvardsson, 2017).

2.2.3 Type of communication

Good communication is fundamental for a successful co-creation partnership with a business customer (Jouny-Rivier, Reynoso, and Edvardsson, 2017). To make sure that the development of the new product runs smoothly, a transparent and complete transaction of knowledge and information between the development company and the involved customer co-creation partner is essential (La Rocca et al., 2016; Prahalad and Ramaswamy, 2004). To achieve this smooth transaction of information, the main challenge that needs to be tackled is the information asymmetry between the two collaborating parties. Depending on the type of customer that is involved and the innovativeness of the product, there can be a struggle to comprehend the complexity of the innovation. This can be reduced by coordinating the type of interaction with the customer and is a huge part of creating a successful new product. One of the most important aspects of a co-creation collaboration is preventing incorrect specifications of customer needs and product attributes (Grafmüller, 2020). The most effective way to decrease the chances of this information asymmetry is by having face-to-face meetings with the customer co-design partner when new information will be shared during that meeting, or if an additional explanation is needed. Also, the use of prototypes during the iterative exploratory design phase is a great method to decrease perceived complexity and support a faster understanding of the concept (Aarikka-Stenroos and Jaakkola, 2012). These prototypes can come in all forms, such as artifacts, drawings, textual documents, or mock-ups, depending on the project. Additionally, this gives the customer a better insight into its tasks during the co-creation process and positively affects the customer's openness and willingness to share information (Hohenschwert and Geiger, 2015). Besides that, these prototypes can also be used as a starting point for exploratory discussions within the co-creation process, or to ask for feedback from the customer on a new prototype. At the same time, it is also important to limit the number of different prototypes to show and discuss during a meeting to avoid confusion on the customer side (Grafmüller, 2020). Also, it is important to make sure that no jargon or representations of the design are used which some participants in the collaboration might experience difficulties with to understand (Kleinsmann and Valkenburg, 2008).

Face-to-face meetings are also a great means to make a good start on the project. This first offline meeting should ideally take place at the location and context in which the eventual finalized product will be used. This creates a better understanding of the requirements of the innovation for both contributing parties (Grafmüller, 2020). At the same time, if the location in which the product will be used is at the facility of the customer, seeing this facility and its limitations and possibilities is relevant

information for the development company. If the context of the usage of the new product is not well investigated, problems can arise later in the development process.

Finally, it is also beneficial to assign a stable point of contact that primarily communicates with the representatives of the business customer. This also contributes to increasing the openness and willingness to share of the participants (Wildenbos, Jaspers, and Peute, 2019). Additionally, this could also mitigate the risk of miscommunication.

2.3 Customer types

The business customer will be involved in the important decision moments, exploratory activities, and validation throughout the new product development process. It is also argued that customer involvement could hinder breakthrough innovations because too much attention is being paid to the requests of the customers and the innovativeness of the product is being abandoned. Furthermore, a customer's unwillingness to change can fully nullify the positive effects of customer co-creation (Khanagha, Volberda, and Oshri, 2017). Therefore, selecting the right co-creation partner is crucial. But how can entrepreneurs identify the most appropriate co-creation partner for the development of their innovations?

Existing research, based on the work of Rogers (1995), divides types of customers based on their adoption behavior regarding innovations. This 'Diffusion of Innovation' model classifies customers into five different categories, based on their speed of adoption: (1) Innovators, who are the first group to adopt new ideas that enter the market. They are open to high-level innovations and are risk-taking, visionary, knowledgeable, adventurous, and imaginative. This group experiences needs and wants months or years before these needs and wants are encountered by the bulk of the market; (2) Early adopters, who are open to new products and services, review them, and share their experiences with others. Their experiences with the innovation are crucial in reaching the larger market. This group needs to see a clear practical advantage for them to use the product; (3) Early majority, who are not adventurous and want proven and guaranteed products, that enhance situations which they are already familiar with; (4) Late majority, who are risk-averse and only want products that have a good track record and positive experiences from earlier adopters; (5) Laggards, who see no value in innovations and might never adopt the new product (Morrison, Roberts and Midgley, 2004; Rogers, 1995; Orcik and Anisic, 2014). The original 'Diffusion of Innovation' model uses a normal distribution to categorize a population between the innovators (2.5%), early adopters (13.5%), early majority (34%), late majority (34%), and laggards (16%). In recent literature these five customer types are still used, but Lund et al. (2020) argue that the percentages assigned to each group are no longer applicable. They imply that the distribution is more skewed towards the innovators and early adopters categories. This is also visible in the visualization of Vargo, Akaka, and Wieland (2020) which is shown in *figure 1*.

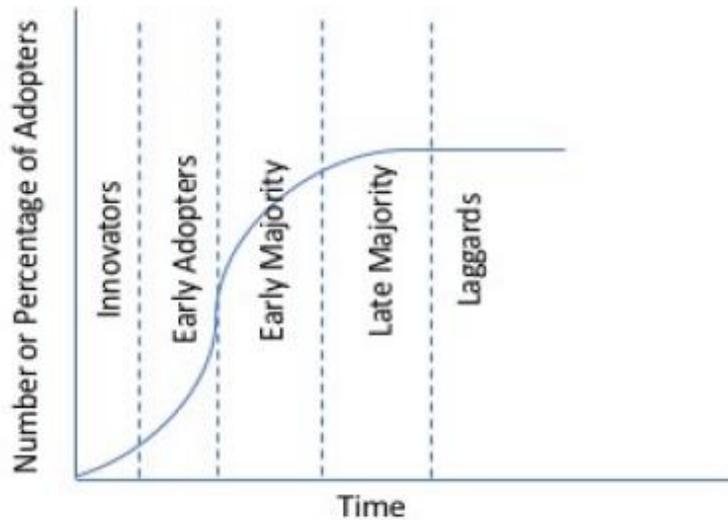


Figure 1 – S-shaped diffusion of innovation (Vargo, Akaka and Wieland, 2020)

The ‘innovators’, who are open to new ideas, risk-taking, knowledgeable, adventurous, and imaginative and are ahead of the market regarding wants, needs, and adoption behavior seem the most valuable co-creation partners for the development of innovations (Morrison, Roberts, and Midgley, 2004; Rogers, 1995; Orcik and Anisic, 2014). This is why the involvement of lead users, which can be classified within the ‘innovators’ category from the Diffusion of Innovation model, is so popular in recent new product development approaches. These lead user innovators are recognized for their superior knowledge of the field of the subject as well as their advanced market needs (Gemser and Perks, 2015). Studies suggest that co-creating new products with customers that show lead user innovator characteristics positively influences the novelty of these innovations (Mahr, Lievens, and Blazevic, 2014). These characteristics are identified in more detail by Dedehayir et al. (2020) and include, among others, a high level of novelty, high opinion leadership, prior experience, a large network, and adequate knowledge. On the other hand, there is also evidence that average customers, which could be categorized as the ‘early adopters’, ‘early majority’, or the ‘late majority’ in the Diffusion of Innovation model, can come up with more valuable and original ideas than lead user innovators or professional developers (Kristensson et al. 2004). Contrary to this research, there is also literature that states that the involvement of average customers in co-creation processes can have a negative influence on innovation outcomes, especially regarding technology-based products (Knudsen, 2007).

Additionally, from the side of the business customer, there also needs to be a certain motivation to collaborate in a co-creation partnership. The drivers of motivation of potential co-creation partners can be divided into four basic categories: (1) *Intrinsic interest in the innovation*, this motivates problem-solving minded novelty seekers, as well as stakeholders with a passion for the future use of the innovation. Extrinsic motivation, such as monetary rewards, is not important for these participants; (2) *Curiosity*, this motivates partners that have little new product development experience, and are interested in the process; (3) *Need*, this attracts parties that are very interested in new products that fill a gap in their current requirements, or are an improvement compared to currently used products or services; (4) *Reward*, this extrinsic motivation attracts collaborators who are driven by (monetary) compensation for their efforts, and not by their interests or needs (Füller, 2010). In most cases, the driver of motivation for customer co-creation partners will be their unmet need. However, this is not always the case, since the business customer is not necessarily the end-user. For a start-up working on an innovation, the most valuable co-creation partners could be the ones that are driven by either an intrinsic interest in the innovation or because of an unsatisfied need, since both are very committed to the new product and its future application. Participants that are driven by an intrinsic interest in the innovation have also shown to be more creative than participants driven by curiosity. Partners that are

driven by their curiosity about the process of new product development will not be committed to, and have low experience and knowledge of, the product that is being developed. It is seen that development processes that involve co-creation participants driven by curiosity show lower exploratory and novelty-seeking behavior, which are very important when developing an innovation. Reward-oriented participants are, however, often very skilled and have previous experience with exploratory activities and design in the context of new product development (Füller, 2010). Nevertheless, not all start-ups will have the financial means to afford a co-creation collaboration with a reward-oriented partner. However, when the skills and experience of the reward-oriented participant are needed to successfully develop the innovation, there are always methods to satisfy both parties without the need for a large upfront financial compensation by the start-up. These options can, for example, include a royalty on sales, or a package of shares of the start-up for the co-design partner.

3. Methodology

3.1 Research Design

In the 'Introduction' section of this paper the gap analysis, the research questions, and the sub-questions were constructed. The next step of this research was to define the research methods that were used to answer these questions. Since the research question is formulated as a 'how' question, a qualitative approach is the best fit for this research. According to Creswell et al. (2007), there are five types of qualitative research, namely phenomenology, grounded theory, case study research, narrative research, and participatory action research. Because of the exploratory nature of the research question, the need for a deep understanding and actionable knowledge, and the fact that extensive existing research on customer co-creation collaborations between B2B start-ups and their customers is lacking, a multiple-case study was used. The case study method consists of a comprehensive exploration from different perspectives of the complexity and uniqueness of a certain topic, with the intention to construct a 'telling case' that can lead to new hypotheses, theories, and concepts that can be used in situations with similar conditions (Roberts et al., 2004; Simons, 2009; Yin, 2018). This fits nicely with the aim of this paper of forming an overview of different experiences and perspectives regarding the use of customer co-creation as a new product development approach, and providing the reader with elaborate examples and actionable knowledge on customer co-creation within B2B start-ups which entrepreneurs can use when facilitating their co-creation partnerships. In contrast, quantitative methods are more appropriate when the aim is to answer a research question with factual and measurable data (Hammarberg, Kirkman, and Lacey, 2016). This does not apply to this research, since customer co-creation is part of the exploratory activities of an organization, which cannot be summarized in measurable data only. This does not necessarily mean that no quantitative data was used to partly answer the research questions. Even though case studies are classified as a qualitative type of research, quantitative data may also be used (Yin, 1992).

This multiple-case study consists of two first-hand cases, case A and case B. Within these cases, observational data was gathered on the development of the company that facilitates the co-creation collaborations and the daily processes within the context of customer co-creation with their business customers. Besides that, in case B, extra attention was paid to the perspective of the business customer that is active in the co-creation process. This was done through a semi-structured interview with one of the representatives from the business customer that were involved in the collaboration, to get a deeper understanding of their experiences in this co-creation process from the point-of-view of the involved partner. For the other six cases, managers or founders of B2B start-ups who personally experienced customer co-creation processes for the development of innovations with a co-design partner were interviewed on this topic to gain a better understanding of practical experiences from the perspective of the facilitating company active in co-creation processes with a business customer.

The unit of analysis for this research, the co-creation partnership between a B2B start-up and their business customer and the implementation of this collaboration in the NPD process of the start-up, was investigated by examining multiple of these collaborative relationships. For this purpose, a variety of cases were selected. The process of the selection of the cases is elaborated upon later in the methods section. Also, an introduction to each of the cases is given in *appendix 8.2*. This appendix will not be included in the published version of this paper to ensure the anonymity of the participated interviewees and organizations. As a preparation for the semi-structured interviews, the start-ups that are part of the identified cases were researched. This was done through a variety of published information sources, such as social media, scientific articles, or news articles. Additionally, an interview protocol was prepared based on the scientific research that was performed on the topic of new product development and customer co-creation. This interview protocol was iteratively adjusted to better fit the context of

the interviews, based on interim analyses of the interviews that were conducted. This interview protocol can be found in *appendix 8.3*. In the interviews, additional time was planned to go more into detail on certain topics or discuss related issues that were not foreseen, if applicable. The audio of these interviews was recorded and later transcribed. The data obtained in the interviews was analyzed to see if the interviews resulted in sufficient information or if follow-up interviews were needed. The data gathered through the interviews were compared amongst each other, and also against the findings from the observational data and the scientific review. To come to the coding scheme, the template approach and Gioia method were used. The exact methods used in analyzing the data are elaborated upon further on in the methods section.

3.2 Selection of Case Studies

To expand the set of investigated cases beyond the two first-hand case studies, several exclusion and inclusion criteria were set up. These criteria are needed to establish trustworthy case studies that lead to usable outcomes in this thesis. The defined exclusion criteria are (1) The co-creation partnership was started before 01-01-2010; (2) The interviewee was not actively involved in the co-creation partnership at the time; (3) The start-up from the case was not registered at the Chamber of Commerce at the time of the co-creation partnership; (4) The start-up from the case did not actively collaborate with (a) customer(s) during the development process; (5) The start-up from the case had more than 20 employees during the period of the co-creation partnership; (6) The case collaboration was not between a B2B start-up and a business customer; (7) The product or service that was developed during the partnership cannot be categorized as an innovation, as described by accepted literature.

Additionally, the defined inclusion criteria are (1) The partnership was started after 1-1-2010; (2) The founders and/or managers of the start-up from the case are willing to participate in the study; (3) The interviewee was/is actively involved in the long-term co-creation partnership; (3) Background information of the start-up from the case can be found through public sources; (4) The product or service that was developed during the co-creation partnership can be categorized as an innovation, as described by accepted literature; (5) The case collaboration was between a B2B start-up and a business customer; (6) The start-up from the case was registered at the Chamber of Commerce at the time of the co-creation partnership.

For this thesis, a total of 140 start-ups were examined on their suitability to be used as a potential case for this research. The large majority of these examined start-ups are based at the High Tech Campus Eindhoven or the Alpha Hub Eindhoven, which is situated on the campus of the Eindhoven University of Technology. This was done because of the high percentage of B2B start-ups that are based in these two locations. Based on the exclusion and inclusion criteria, six start-ups were selected to be incorporated in this paper as case studies by having semi-structured interviews with their founders and/or managers. In combination with the two first-hand cases, in which observational data was gathered and a semi-structured interview with the customer co-creation partner was conducted, the total number of cases used in this research is eight. These cases all cover a B2B start-up that facilitated a customer co-creation partnership for the development of B2B innovations but differ in terms of market segments, start-up sizes, and co-creation partners. The basic information about the start-ups connected to the cases that will be examined in this paper is shown in *appendix 8.1*. A more elaborate introduction to each individual case is shown in *appendix 8.2*. To secure the confidentiality and anonymity that is connected to these interviews these appendices are not included in the published version of this paper, and the individual cases will not be referred to by the name of the start-up but by ‘case A, case B, ...’ etc.

3.3 Data Collection

Throughout this master thesis project qualitative data was gathered to perform the multiple-case study. This was done through both observational data and semi-structured interviews. How this data was collected is discussed in this section in more detail.

3.3.1 Observational data

During the period of this thesis, and seven months prior to the start date of this thesis, observational data was collected on the working processes within the co-creation partnerships facilitated by the B2B start-up covered in case A and case B. This was stored in a log that contained all important events within the start-up and an overview and description of all contact that the representatives of the start-up had with their co-creation partners. This is linked to the time and place that the event took place. The log contains information on the method of contact of the collaborating partners, what they talked about, how both parties reacted to important decisions and events and how these impacted the ongoing collaboration and NPD of the innovation. This observational data was gathered from the point of view of the co-founder of the start-up that facilitated the co-creation collaboration for a period of 10 months (case A) and 3 months (case B).

3.3.2 Semi-structured interviews

For the non-first-hand cases, semi-structured interviews were conducted with the managers and/or founders of the start-up who facilitated the co-creation process with the business customer. For case A, the customer co-creation partner was also interviewed to get a greater understanding of the perspective of the business customer in this collaboration. These interviews were prepared by making an overview of points that needed to be discussed and findings from literature regarding these points. The organizations that are part of the identified cases were also researched beforehand through a variety of published information sources. These include, amongst others, social media channels of the involved organizations, scientific articles, and news articles. The information that was gathered during these preparations was not used to directly ask the interviewee about these topics, but rather as a checklist to ensure the important points were discussed during the interview. The interviews themselves were open conversations, in which the interviewer sparked the discussions by asking open-ended questions and follow-up questions if necessary and suitable. Also, additional time was reserved to discuss topics outside of the scope of the research or related aspects that were not foreseen to get a complete overview of the whole process that these start-ups went through together with their co-creation partner. Because of the influence of the COVID-19 pandemic, all interviews were conducted through the video conferencing software tools Microsoft Teams or Google Meet. The audio of the interviews was recorded and not immediately transcribed during the meeting. This was done to prevent that information was missed due to the inability to follow the pace of the interview with the transcription, and so that the interviewer could completely focus on what was discussed and ask relevant follow-up questions. After the interview, the recording was replayed to construct the transcription. This transcription is an intelligent verbatim transcription, in which irrelevant filler words, pauses, or laughter can be removed. Other small alterations to improve the readability without changing the meaning of the participants' answers, such as improving the structure of a sentence, are also allowed (Eppich, Gormley, and Teunissen, 2019). A total of seven interviews were conducted. This is one interview less than the number of researched cases since case B consisted of only observational data. The average duration of

the interviews was 30 minutes. The data obtained during these interviews were analyzed to see if the interview resulted in sufficient information, or if follow-up interviews or additional research was needed. The interview protocol is shown in *appendix 8.3*.

3.4 Data Analysis

Once the input from the interviewees was transformed into transcripts of the interviews, all obtained data was analyzed to be able to extract findings from it. This was done by the process of coding. The analysis of the acquired data is partly deductive and partly inductive. The first step of the analysis is deductive, where the findings from the literature review are revisited and transformed into a coding scheme based on the template coding method as described by Yin (2018). This theory-driven coding approach uses a pre-defined coding scheme which is then used to structure the qualitative data from the semi-structured interviews.

Secondly, the inductive analysis was performed. For this purpose, a new coding scheme was constructed based on the Gioia method (Gioia et al., 2012). This approach was developed to extract new constructs from a collection of qualitative data. Therefore, this method seemed convenient for the identification of insights and constructs from the interview transcripts and observational data that were not yet identified in the existing literature. Then, these two coding schemes were put side by side to see the similarities and differences of the identified codes. Finally, the coding schemes were combined into one all-encompassing data structure that was used to categorize all insights from the qualitative data from the semi-structured interviews and observational data. The 12th version of the Nvivo software was used for the coding process.

3.4.1 Deductive analysis

To see whether the constructs identified in the literature review were recognized by the interviewees of the selected cases, a template approach was used. The template approach uses a pre-defined coding scheme that is then used on the obtained qualitative data (Yin, 2018). For this purpose, a coding scheme was developed from the existing literature that was discussed in the scientific review of this paper. This coding scheme was created by closely examining all findings from literature and describing those findings through small keywords, which are the actual codes. This collection of codes was then revisited. Overlapping concepts were combined into one code for each finding. This range of codes was then compared to the inputs of the interviewees in the qualitative data. Codes that could also be linked to statements in multiple qualitative data sources were maintained and codes that could not be confirmed through the collected qualitative data were discarded. The remaining codes that flow out of that process were then assigned to different categories, that each embody an important factor of the customer co-creation process. However, since this data structure only contains the factors identified in the literature, part of the insights from the qualitative data remained uncoded, unassigned, and thus unstructured. This is why an additional inductive analysis was performed.

3.4.2 Inductive analysis

To be able to code the part of the collected data that was not yet identified in the literature to see if additional insights were found during this research, the Gioia method was used (Gioia et al., 2012). For this approach, it was important to be familiar with the contents of the acquired data before constructing

the coding scheme. Therefore, both the interview transcripts as well as the observational data were carefully read through to identify all potentially interesting keywords and concepts. Codes were assigned to all potentially interesting statements. Then, all documents were re-read and first-order concepts were constructed for codes that stood out by being addressed in multiple cases. This was an iterative process. Statements were relabeled and first-order concepts renamed while the analysis process was performed to let the coding scheme depict the contents of the qualitative data. In total, thirty-six first-order concepts were identified. After that, the first-order concepts were compared to the identified first-order concepts from the template approach. The first-order concepts identified in the qualitative data that were already embodied by similar or comparable first-order concepts from the template approach were discarded. This resulted in nine new first-order concepts that were identified from the qualitative data and not yet represented by a first-order concept from the template approach. These new first-order concepts were then categorized in the second-order themes from the template approach. Not all of the first-order themes could be categorized as one of the second-order themes from the template approach, which also resulted in an additional identified second-order theme through this inductive analysis.

3.4.3 Data structure

The two approaches described above led to two coding schemes that were used to identify and categorize insights from the collected qualitative data. A big part of these two schemes overlapped since the findings in the literature were used to partly set up the interview protocol for the semi-structured interviews. However, not all insights that came forward from the analysis of the qualitative data were previously identified during the scientific review. That is why the Gioia approach led to nine additional first-order concepts and one additional second-order theme that could not be assigned to the coding scheme constructed through the template approach. This resulted in a combined data structure that consists of twenty-seven first-order concepts, which are categorized into eight second-order themes. This process is visualized in *figure 2* to make the procedure more understandable. These eight second-order themes were divided into three overarching dimensions, which represent the three phases of the collaboration. A visualization of the final data structure is shown in *figure 3*.

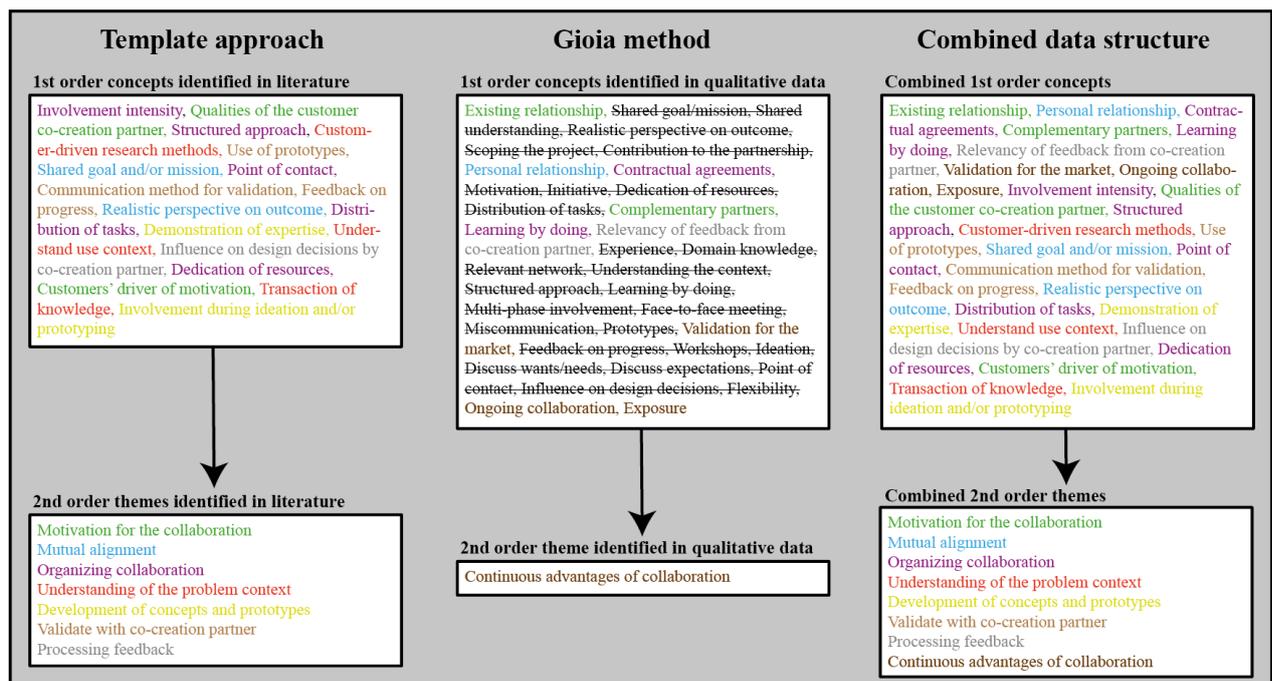


Figure 2 – Constructing concepts and themes

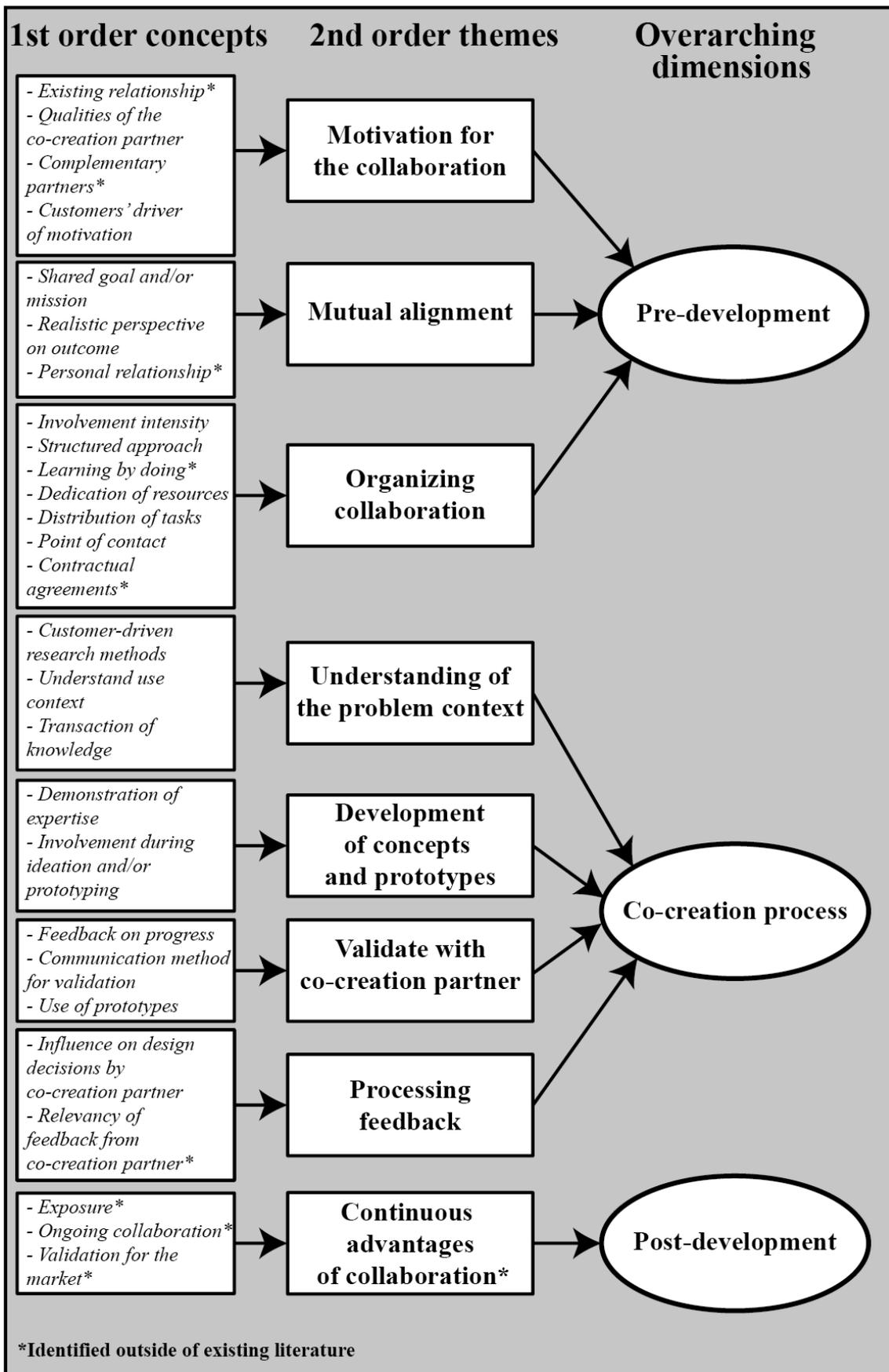


Figure 3 - Data structure

For each of the first-order concepts that are present in the data structure, a short definition is given in table 1 that clarifies the meaning of the code in this research:

First-order concept	Definition
Existing relationship	<i>The relationship between the B2B start-up and the customer co-creation partner prior to their collaboration.</i>
Qualities of the co-creation partner	<i>The attributes of the customer co-creation partner that could be of use in the collaboration.</i>
Complementary partners	<i>The extent to which the start-up and the customer co-creation partner believe that their individual qualities would take each other to the next level during the collaboration.</i>
Customers' driver of motivation	<i>The reason behind the participation in the collaboration of the customer co-creation partner.</i>
Shared goal and/or mission	<i>The objective that both the start-up and the customer co-creation partner envision for the partnership, and whether they are congruent.</i>
Realistic perspective on outcome	<i>The outlook that is being presented during the collaboration, and whether this is achievable.</i>
Personal relationship	<i>The relationship that is being formed between the start-up and the customer co-creation partner during the course of the partnership.</i>
Involvement intensity	<i>The amount of contact moments in which the start-up involves the customer co-creation partner in the NPD process.</i>
Structured approach	<i>The predefined NPD process that was being followed throughout the collaboration.</i>
Learning by doing	<i>The adjustments that were made to the NPD process due to experiences gained over time.</i>
Dedication of resources	<i>The agreements that were made between the start-up and the customer co-creation partner on the commitment of funds and assets by each party.</i>
Distribution of tasks	<i>The agreements that were made between the start-up and the customer co-creation partner on the tasks each party is responsible for during the collaboration.</i>
Point of contact	<i>The representatives from the start-up and customer co-creation partner that have the most intense contact with each other on behalf of their organization.</i>
Contractual agreements	<i>The agreements that were committed to by use of a formal contract.</i>
Customer-driven research methods	<i>The research techniques with a focus on freedom and room for imagination by the customer to find underlying values, behaviors and needs.</i>
Understand use context	<i>The understanding of the way and situation in which the innovation will be used by the end-user.</i>

Transaction of knowledge	<i>The communication methods which are used during the phase of understanding the problem context.</i>
Demonstration of expertise	<i>The activity by the start-up of showing the customer co-creation partner the knowledge and qualities that the start-up possesses.</i>
Involvement during ideation and/or prototyping	<i>The extent to which the start-up involves the customer co-creation partner in the ideation and prototyping phase.</i>
Feedback on progress	<i>The reaction that the customer co-creation partner gives to the start-up on the progress of the NPD process.</i>
Communication method for validation	<i>The communication method that is used during the validation phase.</i>
Use of prototypes	<i>The extent to which prototypes are used by the start-up during feedback sessions to communicate the progress of the NPD process to the customer co-creation partner.</i>
Influence on design decisions by co-creation partner	<i>The impact that the feedback of the customer co-creation partner has on forming the innovation.</i>
Relevancy of feedback from co-creation partner	<i>The extent to which the feedback of the customer co-creation partner is relevant due to their domain knowledge and experience.</i>
Exposure	<i>The attention and awareness that is generated in the outside world as a result of the collaboration.</i>
Ongoing collaboration	<i>The extent to which the start-up and customer co-creation partner continue to work together after the NPD process is completed.</i>
Validation for the market	<i>The value that the collaboration has on proving the use for the innovation for other potential customers.</i>

Table 1 - First order concept definitions

To give more insight into the assigned statements to each of the first-order concepts, an example quote is given for each code in *appendix 8.4*.

3.5 Research Validity and Reliability

According to Yin (2018), it is extremely important for research that uses a case study approach to assess construct validity, external validity, and reliability of the research properly. For case study research, proving external validity is questionable because the individual cases are very specific and elaborate on the particular situation of that isolated case. However, by performing a multiple-case study, this problem is diminished. To assess the construct validity, external validity, and reliability of this research, methods by Yin (2018) were used to prove the scientific accuracy of this paper.

The construct validity regards whether the created knowledge correctly describes the studied phenomenon (Yin, 2018). This construct validity was secured during this research by having a strong foundation for analysis in the form of an extensive literature research. This foundation is used to compare the input from the observational data and the semi-structured interviews with the already known characteristics of the customer co-creation approach. Also, for the interviews with the different organizations both a within-case analysis as well as a cross-case analysis were performed to see if there

are overlapping experiences. Also, desk research on the organizations from the cases was done as an additional source of information. By using these multiple sources, this research aimed to achieve triangulation and widely substantiated cases to support a strong construct validity for this master thesis.

The external validity concerns whether the results of the research are generalizable (Yin, 2018). This paper uses a multiple-case study approach with 8 different cases that show similarities in the studied phenomenon of customer co-creation processes in a B2B setting but differ in terms of market segments, size of the start-up, and the co-creation partners. This variance within the selected cases significantly increases the generalizability of this research and helps to find overarching causal relationships. Next to this, the theoretical review that uses a wide variety of knowledgeable and accepted scientific sources which support the findings from the qualitative data makes the generalizability of this research even stronger.

Finally, the reliability of the research is assessed. This is done by investigating whether the study can be replicated by others and result in the same outcome. This is aimed for through a focus on transparency of the followed process in the methodology and the cases. The contents of the case studies, interview protocol, and analysis procedure are shown as much as possible while securing confidentiality and anonymity. This is done, for example, by using anonymized quotes of the interviewees in the results section. Furthermore, the researcher was in close contact with university supervisors throughout the process to ensure a scientific approach to the research. These supervisors did get a complete insight into the data and used approach, including the sections that are secured for confidentiality and anonymity. One problem might be that a single researcher is executing this research and this researcher's position of co-founder in case A and case B for which the researcher obtained the observational data that was used for this thesis. The subjective influence that this researcher could have is mitigated by staying close to the objectiveness of the obtained qualitative data and outside sources and by, again, keeping in close contact with supervisors that ensure that the research is performed in a scientifically reliable way.

4. Results

After extensively analyzing and coding the qualitative data against the data structure in an iterative way, a clear overview of the findings was constructed. In this section, the findings from each individual case are discussed in the within-case analysis. After that, the concepts that were identified in the data structure are also extensively elaborated upon in the cross-case analysis.

4.1 Within-case analysis

In this within-case analysis, the data structure was used to organize the results by using the second-order themes as individual headers within each of the individual case analyses. Also, the type of organizations involved in the particular partnership were briefly mentioned, within the borders that are present because of the confidentiality and anonymity connected to this research. The qualitative data that was gathered gives an understanding of the partnership within each of the cases. Interviewee statements were also used to underpin that the understanding of the concepts as described in this section were extracted from the qualitative data. Before taking a deep dive into the individual cases, an overview of some of the important characteristics of each case is shown in *table 2*.

	Case A	Case B	Case C	Case D	Case E	Case F	Case G	Case H
Relationship prior to the partnership	No	No	Yes	No	No	Yes	No	No
Initiator of the partnership	Customer co-creation partner	Customer co-creation partner	Start-up	Start-up	Start-up	Customer co-creation partner	Start-up	Start-up
Motive for partnership (Customer co-creation partner)	Need	Intrinsic interest in the innovation, Need	Intrinsic interest in the innovation, Reward-oriented	Intrinsic interest in the innovation, Reward-oriented	Reward-oriented	Need	Need	Need
Motive for partnership (Start-up)	Create innovation with good product-market fit, Exposure	Branch out to another market, Achieve good product-market fit	Branch out to another market, Achieve good product-market fit, Exposure	Branch out to another market, Achieve good product-market fit	Develop high-end product	Branch out to another market, Achieve good product-market fit, Reward-oriented	Create innovation with good product-market fit	Create innovation with good product-market fit
Partner selection criteria	Domain and end-user knowledge, Relevant network	Domain and end-user knowledge, Relevant network, Validation for the market	Domain and end-user knowledge, Relevant network, Validation for the market	Not applicable	New product development experience, Strong track-record	Not applicable	Domain and end-user knowledge, Relevant network, Validation for the market	Domain and end-user knowledge, Validation for the market
Stage of the partnership	Minimum valuable product delivered, development ongoing	Development ongoing	Fully commercialized product, Combined marketing efforts ongoing	Development ongoing	Fully commercialized product, Re-design project started	Fully commercialized product, Continuously working on improvements	Fully commercialized product, New NPD process started	Development ongoing

Table 2 - Case characteristics

4.1.1 Case A

This case is one of the two first-hand cases of this thesis. Case A covers the customer co-creation partnership between a software development start-up and a professional football organization. Both the start-up and the football organization come from the Netherlands. The football organization approached the software development start-up with the need for a software tool that can be used during training sessions with their athletes to improve their performance. The innovation is already implemented by the customer co-creation partner but is still being further developed.

Motivation for the collaboration

The origin of this customer co-design collaboration is not a common one. The organizations did not have any existing relationship before the partnership started. The football organization experienced an unfulfilled need and approached an educational institution to find a group of students to work on this challenge. This group of students made great progress in this project and decided to continue with it after the educational course. The students founded the software development start-up to continue their work on this new product development process in collaboration with the business customer. Despite the fact that the start-up was founded at a later stage of the partnership, the founders did pay attention to the qualities of the co-creation partner and how these qualities would benefit the collaboration by forming complementary partners. The representative from the football organization, which is the interviewee in the semi-structured interview, confirmed that the customer also saw both parties as complementary partners: *“I believe that a multidisciplinary team is always an advantage. Early in the process, it became clear what the added value of your team members was. I think that this can also be seen in the final product.”* The driver of motivation from the customer’s perspective was the unfulfilled need that they experienced in the current market.

Mutual alignment

In this collaboration, not much attention was spent on creating mutual alignment in an early stage. From the semi-structured interview with the customer, it can be concluded that the shared goal and mission of both parties were not clear to each other and were not properly discussed. There was also no specific attention spent on building a personal relationship between the start-up and the customer co-creation partner. The first-order concept ‘Realistic perspective on outcome’ did not come forward from the obtained qualitative data at all. This is for a big part due to the fact that this collaboration started as a course project in which the focus was on the learning process of the involved students and less on the innovation that was developed during this trajectory. This resulted in issues further in the collaboration. The customer co-creation partner had doubts about the focus of the software development start-up, and the customer was unsure if the start-up was completely committed to fulfilling their unmet need instead of exploring other use cases for the innovation: *“You started to investigate the applicability of the tool for other target groups pretty early on. We therefore sometimes got the feeling that you lost the focus on our specific use case.”* The lack of an existing relationship before the start of the collaboration did also not contribute to relieve the doubts that the customer co-creation partner experienced. This worry was communicated by the football organization and was worked out during an additional meeting in which the start-up made clear that their main focus was on creating the innovation for the use case of the customer co-creation partner. After the course ended the students, a representative from the educational institution and the customer co-creation partner had a long meeting in which the continuation of the project after the course was discussed and the goals and roles of each participant were communicated.

Organizing collaboration

Contrarily, the collaboration partners did have clear agreements on the more practical aspects of organizing the collaboration. Over the course of the project, a structured approach was determined by

agreeing on a rough timeline. This timeline consisted of clear deadlines for the early phases of the process and defined the order in which the characteristics of the innovation were finished, based on the envisioned minimum valuable product. It was communicated that this timeline could change during the process because of the uncertainties and changes connected to exploratory activities. This flexibility is also seen as a good quality of a start-up by the customer co-creation partner. But because of this flexibility of the process, and the fact that this project was the first of its kind for the start-up, the approach can also partly be seen as learning by doing. The involvement intensity of the business customer in the process was clear throughout the collaboration. It was predetermined that both parties had fixed online meeting moments once every two weeks. In between meetings, they stayed in contact through WhatsApp and email, and additional meetings were arranged if necessary. Also, the tasks that each party focused on and the resources that they committed to these tasks were known beforehand. The start-up took the lead in the ideation phase while involving the customer regularly to discuss new concepts. The development of the software was done solely by the start-up. The co-creation partner took the lead in testing the prototypes with their athletes while the start-up was informed on the outcomes of those. Deadlines for these activities were also agreed upon. Both organizations appointed a fixed point of contact. These two representatives handled the communication that did not require the expertise of specific participants in the collaboration. At the start of the project, an internship agreement and NDA were signed. Once the start-up was officially founded, the internship agreement was terminated and a partnership contract was agreed upon. The interviewee, which was the representative of the customer co-creation partner, was satisfied with these agreements: *“I think it would be beneficial to formalize more aspects at the start of a collaboration, but I think we reached the agreement about the ongoing partnership in close consultation and that we reached a deal which is satisfying for both parties.”*. The software development start-up did not use a fully worked-out approach for the trajectory of the project. However, there were clear higher timeframe deadlines and directions. Also, the contact with the customer and the contents of those contact moments were prepared in a structured way.

Understanding of the problem context

The nascent entrepreneurs spent considerable time during the collaboration on better understanding the problem context. To better understand the use context of the future innovation, discussions were held with the customer asking about their current training situation and how they envision it to be improved. Quickly after that, the start-up asked for an in-person meeting at their training facility to experience the situation first-hand and to assess the possibilities of implementing potential innovations. Also, customer-driven research methods were used. During meetings open-minded follow-up questions were asked about the needs and wants of the customer, to dig deeper into their underlying needs. Also, some workshops were facilitated for the customer co-creation partner for this purpose. The openness and willingness to share information by the customer co-creation partner were high. One of the reasons is also because the football organization took the initiative in starting the collaboration because of their unmet need. The transaction of knowledge in this phase was mostly online, with the exception of the beforementioned face-to-face meetings at the training facility of the customer to better understand the use context.

Development of concepts and prototypes

During the development of concepts and prototypes, most tasks were taken on by the software development start-up. They have the most expertise in this area, which was also recognized by the customer. During ideation and brainstorming sessions the co-creation partner did participate regularly to create concepts that satisfied the needs and wants of the customer, which the start-up then translated to a prototype. One example of this is a value-sensitive design workshop that the start-up facilitated for the business customer. For this workshop, the stable point of contact and the user experience and user interface (UX/UI) expert of the start-up visited the training facility of the partner. The goal of the workshop was to construct a list of requirements for the software tool by creating storyboards and

personas to get an in-depth understanding of how the tool must look and be used according to the customer. These requirements were developed and discussed in an iterative and exploratory way together with the co-design partner. The semi-structured interview with the business customer did unveil that the communication during the project is something the start-up must improve: *“I think that we could see in the way of communicating that this was the first time that you as a team experienced such a process. The communication was, especially in the middle part of the trajectory, not always clear.”*.

Validate with the customer co-creation partner

In the validation meetings with the co-creation partner, the start-up asked for feedback on their progress on a bi-weekly basis. Early in the development process the contact method for these meetings were often online calls, such as when the customer had to give feedback on brainstorming sessions or identified characteristics of the innovation. However, later in the process these meetings also became in-person from time to time. Especially when a prototype of the software was presented and the customer validated the prototype during training sessions with their athletes. In all of these meetings, the start-up made use of prototypes to make the progress visual and easy to understand and experience for the co-creation partner.

Processing feedback

The input from the customer had a huge impact on the design decisions that were taken by the start-up. Not only for the UX/UI design but also for the contents of the software tool, since the customer has extensive experience and knowledge on training their athletes. The feedback from the customer was therefore very relevant in multiple aspects of the design process and was leading when making design decisions. This is also confirmed by the customer co-creation partner: *“I think we were very closely involved. We explained clearly what we wanted and what we found the most important. [...] In the end, the tool became exactly how we envisioned it, so it is clear that this was taken into consideration during the development process.”*.

Continuous advantages of the collaboration

Next to the innovation that resulted from the customer co-creation collaboration, the partnership had more continuous advantages for the start-up. Both parties signed a long-term agreement to continue working together on the further development of the tool. Next to this, the football organization and the start-up are both part of a working group with relevant and influential organizations in the BrainPort region. The football organization also supports the start-up in its marketing activities, resulting in positive exposure. The innovation is also used daily by the football organization from 01-08-2021 onwards. This is also great validation for the complete (professional) football market that the innovation fills an unmet need in this sector.

4.1.2 Case B

This case is the second first-hand case of this thesis. Case B covers the customer co-creation partnership between a software development start-up, which is the same start-up that is involved in case A, and a neurological institute. Both parties are organizations from the Netherlands. This neurological institute is specialized in special education for children with (neurological) disabilities. The innovation is not yet implemented by the customer co-creation partner, and is still in the early stages of development.

Motivation for the collaboration

The participants in this collaboration did not have any form of existing relationship before the start of the partnership. The neurological institute took the initiative to lay contact between the two parties since they had been following the development of the software tool of the start-up closely and saw it as an innovation that could also be beneficial for the patients of the institute. The institute became aware of the project described in case A because of their own collaboration with the professional football organization from that case and approached the software development start-up with the question to create a comparable software tool for the healthcare and education market. The institute had an intrinsic interest in the innovation since they had already seen promising results in previous clinical trials that they had done with a comparable software training tool. However, this tool did not precisely align with their situation. Moreover, because of a change in strategy of the development company of that previous tool it was no longer active in Europe. The expertise of the customer co-creation partner in the field of healthcare and education, the experience and knowledge they gained with previous clinical trials, and the huge domain network of the institute, made the start-up decide to agree to a long-term partnership. The start-up saw the neurological institute as a potentially valuable and complementary partner for this trajectory. The driver of motivation from the customer's perspective was the unfulfilled need that they experienced in this area in the current market in combination with an intrinsic interest in the innovation.

Mutual alignment

Unlike the other first-hand case, the start-up did pay more attention to achieving mutual alignment with the co-creation partner to prevent the issue that was encountered during the partnership of case A. This was increasingly important because of the lack of an existing relationship between the participants before the start of the collaboration. Both participants of the collaboration clearly communicated their intentions for this partnership and what they eventually wanted to achieve. The start-up made clear that it had commercial intentions, but was committed to achieving the best possible innovation for the patients of the institute since this was the main motivation for the start-up and this is also needed to come to commercial success. Discussing the timeline early on, and the spoken intention of both organizations to form a long-term partnership, made sure that everyone had a realistic perspective on the process and outcome of the trajectory. By also putting effort into building a personal relationship, the start-up aimed to lower the barrier to lay contact whenever it was needed and to be able to create an environment in which everyone could speak their mind. This was done by small adjustments in the method of contacting, for example, communicate on a first-name basis from the very start (*"The representatives from the neurological institute told us to communicate on a first-name basis. We keep doing this from now on, to achieve a less formal and more open collaboration."*) and having face-to-face meetings whenever it was possible. These adjustments compared to the other first-hand case of this start-up showed to be very effective in building a personal relationship between the partners: *"The customer co-creation partner expressed that they enjoyed the way we communicate and collaborate and want to aim for a long-term relationship. This is a great sign of trust in the collaboration and our start-up, which is what we tried to establish from the very start."*

Organizing collaboration

For this new product development collaboration, clear agreements were made to ensure a structured approach to the process. The start-up believes that good preparations and communication are needed to achieve a trustworthy relationship between the two partners through showing commitment to the collaboration. Also, making the timeline clear from the start helps to set the right expectations. No fixed meeting day was appointed but the intention to regularly meet face-to-face, at least once a month with all participants, was spoken out. Outside of the meetings with all participants, both organizations appointed a fixed point of contact who had contact with each other in between meetings through e-mail and telephone calls. Clear agreements on the distribution of tasks were also made. The start-up focused on the development and ideation of the software, in which the start-up involved the neurological

institute for the content of the software and important design decisions. The institute took the lead in the connected scientific research and future clinical trials in which the innovation will be used. The dedication of resources was not specifically mentioned in the qualitative data, outside of the dedication of time to the divided tasks. When the collection of observational data was stopped, the partners were in negotiations of a formal contract that covers the activities of the collaboration and the potential successful outcome.

Understanding of the problem context

The start-up spent considerable time on understanding the problem context. This was very important since the envisioned target group, children with (neurological) disabilities, are very vulnerable. To understand the use context of the developing innovation, open discussions about the use setting of the product were held with the co-creation partner and the start-up itself did elaborate background research on the different types of disabilities that the patients of the institute experience. It was also agreed that the medical expert of the start-up will be closely involved during the future clinical trials in which the innovation will be used to improve the understanding of the role of the innovation in the research. Customer-driven research methods were used to figure out any underlying needs that did not come forward in the earlier talks. These research methods mostly consisted of open conversations in which the customer was invited to take the initiative in communicating the challenges their patients face in their daily functioning. The start-up prepared scenarios and visual aids and asked follow-up questions to keep the conversation going. This went very smoothly, since the openness and willingness to share from the customer co-design partner was high because the customer really saw value in the innovation for their patients. This also resulted in the partner taking initiative in sharing additional information, such as video material of previous clinical trials that they performed to give the start-up an insight into the research setting and the abilities of the patients. After the first introduction meeting, these talks were held in person, to help build the personal relationship and because the start-up believes that it is easier to create a better transaction of knowledge and a shared understanding of the problem and development process when communicating in person. The customer also expressed that they enjoyed the way of collaborating and communicating and aim for a long-term collaboration because of this, also after the NPD process for this innovation is completed.

Development of concepts and prototypes

The customer communicated that they do not have notable technical expertise, which is why the start-up took the technical side of development on completely. The expertise of the start-up in this area was also recognized by the co-design partner, who asked the start-up to take on the role of an advisory board in future innovations of the institute regarding the technical side of neurological developments. The customer was heavily involved in the ideation phase. Multiple face-to-face meetings were held to discuss the needs and wants of the institute, in which they put the patients central. In these meetings, brainstorm sessions were organized to construct a list of requirements for the software training tool. Also, the neurological institute had considerable input in the UX/UI design of the tool, since they know the capabilities of the patients regarding the interaction with the innovation. For this purpose, the start-up also facilitated a value-sensitive design workshop for the partner. During this workshop personas and storyboards were used to understand the future use of the innovation and what important characteristics the tool must have to be successful.

Validate with the customer co-creation partner

In between the meetings the software development company worked out ideas that came forward and combine them into early-stage concepts. These concepts were shown to the customer and their feedback was collected. These meetings were always done in person because it is believed that this increases the understanding of the problem and concepts for both parties. There were no digital prototypes of the software used yet because the early stage of the development. However, the start-up did create

storyboards and personas which were shown to the co-creation partner during the value-sensitive design workshop to ensure a shared understanding of the discussed situation between all participants.

Processing feedback

Even though the partnership was not in an advanced stage yet, it was agreed that, for the UX/UI part of the innovation and the contents of the software, the customer has an important say in the design decisions. This is because of their expertise in this area regarding the envisioned target group. This is also relevant because the neurological institute will take the lead in the clinical trials that will be set up. They will therefore be leading in deciding what they want to research during those trials, and thus what parts of the innovation must be ready at a certain time.

Continuous advantages of the collaboration

The neurological institute and the start-up have expressed the intention to commit to a long-term collaboration: *“Next to our ongoing co-creation collaboration, the board of the neurological institute asked us if we are open to being part of an ‘advisory board’ for the technical side of future neurological developments. We agreed, because we believe this will only make the bond, mutual trust, commitment, and expertise of both parties stronger.”*. The contract, which was in ongoing negotiations at the time of collecting the observational data, will also be aimed at a long-term partnership. Furthermore, the clinical trials will be performed during and after the development of the innovation. This will also be useful for the start-up since it can validate the effectiveness of the innovation which will be needed to expand to other clients. The neurological institute has also committed to using its network to implement the software tool in other organizations when the trials show positive results.

4.1.3 Case C

Case C covers the customer co-creation partnership between a software development start-up with a focus on serious gaming and a health clinic, both come from the Netherlands. This health clinic is specialized in treating and preventing heart problems. The innovation is fully commercialized.

Motivation for the collaboration

The organizations involved in this collaboration had an existing relationship before the start of the collaboration. One of the founders of the start-up already knew the founder of the health clinic well, and they had previous conversations about a potential collaboration, but the start-up came with the first serious proposal. The health clinic was very interested in the collaboration because it saw potential in the serious gaming software of the start-up, that was already active in another market, for the patients of the clinic. The customer co-creation partner had specific knowledge of the envisioned target group, as well as the needed medical knowledge. Additionally, the clinic had a large relevant domain network. This, combined with the software and business knowledge and experience of the start-up makes that the start-up sees the clinic as a complementary partner, which the interviewee also finds very important when working together: *“Then you see that we are actually really complementary to each other, that we fit together well. Only if that is the case, a possible co-creation partnership becomes a possibility.”*. The driver of motivation from the customer’s perspective was the unfulfilled need that they experienced in this area in the current market. Additionally, the business customer was also reward-oriented since it recognized the commercial potential of the innovation.

Mutual alignment

The start-up values that they have a shared goal and mission with their collaboration partners. At the very start, they look if they can find that shared goal, and if that is not found the start-up will not commit

to a partnership. They believe that a project is destined to fail if the participants do not have the same ambitions. This first conversation on the potential collaboration was done face-to-face. Because the participants in the collaboration knew each other earlier, the personal relationship was already there. Over the course of the collaboration, it became much more of a friendship, but that friendship also grew from the fact that they had a strong shared mission. Finally, the start-up also defined the envisioned endpoint of the project at the very start. Only when that was done, the next steps in the new product development process were taken.

Organizing collaboration

The start-up defined a relatively structured approach for the collaboration. Both founders had previous knowledge and experience in the business world, including facilitating co-creation collaborations. They used this experience to define important phases and steps in advance while keeping room for the flexibility that is needed in these exploratory activities. These phases consisted of defining the mission and target group, the ideation phase, the development phase, the validation phase, and the commercialization phase. The involvement intensity of the customer differed depending on the phase of the development. Especially when defining and understanding the target group and the UX/UI design of the serious gaming program many conversations were held between the partners. This became less frequent during the technical development of the software. After that, during the validation with the target group and marketing activities, the involvement intensity increased again. Both partners, at the start of the trajectory, broadly agreed on the distribution of tasks and dedication of resources for the project. A big part of being complementary partners is that both bring qualities to the collaboration that take the partnership to the next level. The start-up finds it important that, in general, there is an agreement on what this contribution will look like. Regarding the distribution of tasks, it was agreed that the main focus of the business customer was on marketing the innovation, while the start-up took the lead in the development process that comes before that. Despite all these agreements, nothing was written up in a contract. Because of the personal relationship of the participants, it was all done based on mutual trust and the belief in their shared mission: *“The personal relationship is key to how your business relationship looks like. When you do not have a shared mission, and a lack of mutual trust, you will see that there will be more NDAs and contracts needed.[...] So you should first work on your personal relationship.”* However, it was necessary to formalize some agreements in a contract at the end of the NPD process, since the customer co-creation partner receives a royalty for each sale of the innovation. There was no mention of a fixed point of contact in the obtained qualitative data.

Understanding of the problem context

The collaboration with the clinic was very useful in understanding the problem context. This organization has extensive experience with the envisioned target group and their treatment. This is why the start-up had many conversations with the expert from the clinic to get a better understanding of the future end-users and the use context of the innovation. To get an in-depth understanding, a 3-month customer-driven research trajectory was done. During this period, 30 patients from the clinic were put on the serious gaming program that the start-up earlier developed for the business market. The outcome of this pilot, the input from the end-users, and the expertise of the customer co-creation partner were used as a great starting point to create a software that was tailor-made to the new target group. The interviewee also mentioned that he believes an important aspect of this is clear communication and transaction of knowledge. It must be prevented that there is a difference between what the customer expects or seems feasible, and what the developers have in mind.

Development of concepts and prototypes

Since this was agreed upon at the start of the process, the division of the tasks was clear. The start-up fully took on the technical development of the tool. This is also because the start-up has demonstrated their expertise in this field with their earlier product, which is also recognized by the co-design partner.

However, the business customer was involved in the ideation phase. After the pilot of 3 months, both parties looked at how the software could be made to fit the needs and wants of the new target group. For the contents of the program and the visualization of the game, the partner collaborated closely. For example, the expert from the clinic completely designed the avatar which was present in the software, with the help from the game developer from the start-up. Also, in designing the UX/UI the partner was heavily involved.

Validate with the customer co-creation partner

The opinion of the co-creation partner was constantly asked for. Especially because the whole development of the innovation was done by the start-up, it was important to frequently ask if the expectations of the business customer were met. The exact method of communication was not mentioned in the qualitative data for this case. However, the importance of using prototypes during the validation phase was confirmed. Especially when making something from scratch, prototypes are essential in communicating the concept and testing if it meets the expectations of the partner.

Processing feedback

As mentioned earlier, the clinic has extensive expertise in the treatment of the end-users. The contents of the software are also derived from the knowledge of the experts from the clinic. This is also why the opinion of the partner was leading when looking at the contents of the program. Also when talking about the visualization and UX/UI of the game, the voice of the co-creation partner was very important. This expertise, which the start-up itself does not have, is also the main reason why the feedback of the partner was very relevant for the development of the innovation and was therefore also taken seriously by the developers.

Continuous advantages of the collaboration

The customer co-creation partner was responsible for the marketing side of the project. This is an ongoing process, so the collaboration is still active. In exchange for this, the partners agreed on a royalty deal. Next to this, the pilots that were ran and the continuous use of the software by the clinic is also a nice validation of the program for the rest of the market. The marketing partnership also contributes to that. Additionally, this gives the needed exposure for the start-up. The big network of the clinic also resulted in the collaboration being discussed in widely known Dutch media sources: *“The customer co-creation partner has their own marketing officer who took this on. She made sure that we got airtime on Dutch television at Omroep MAX and we had interviews in multiple Dutch magazines such as de Telegraaf, de Linda, Mijn Geheim, and de Story.”*

4.1.4 Case D

Case D covers the customer co-creation partnership between a software development start-up from The Netherlands and a large software development company that is headquartered in Sweden. This large software company has created an application with digital and mental exercises to prevent health problems that result from sitting for a long period of time or other lack of movement, aimed at office workers. The innovation is not yet implemented by the customer co-creation partner, and is still in the early stages of development.

Motivation for the collaboration

The start-up and the customer co-creation partner did not have any form of existing relationship before the start of the partnership. The start-up approached the large software development company because the start-up was convinced that their new technology was able to improve the existing software of the

co-creation partner. After a month of communication with the board of the company, it was concluded that the cooperation would not work out since the Swedish board members did not believe in the technology. After that, the director of the Dutch branch of the business contacted the start-up. He did want to pursue a collaboration because he believed in the added value of the technology. He thought that the technology and activities of the start-up were complementary to the software of the software development company. The qualities of the customer co-creation partner were not specifically discussed in the qualitative data, but looking at the track record of the company, it can be assumed that their large user base and domain knowledge of the relevant software market played a role in approaching them for a partnership. The driver of motivation for the customer co-creation partner can be seen as a combination of reward-oriented and an intrinsic interest in the innovation.

Mutual alignment

At the start of the collaboration, no time was spent on forming a shared goal or mission. However, no problems arose as a result of this: *“Up to this point it was always very logical what the next steps would be. We did not experience any differences of opinion or endless discussions about this.”*. This does imply that both parties have the same end goal in mind. The first meeting with the director of the Dutch branch of the company was held face-to-face at his house. For this meeting, the start-up prepared a presentation with the future steps that they envisioned to provide a realistic perspective on the future collaboration and outcome to the business customer. The reason why this meeting was held face-to-face was to build up a personal relationship and mutual trust. Also, the start-up likes to see someone in person before starting a collaboration. This is especially important when the participants do not have an existing relationship before the start of the collaboration, which was the case here.

Organizing collaboration

For this collaboration, the start-up and its partner set up structured sessions throughout the collaboration on multiple occasions, but they often deviated from these, since the new product development process is very unpredictable and open to changes which requires the participants to be flexible. The start-up did not follow a specific method for the process as a whole. So the process can be defined as learning by doing, with the exception of some structured sessions. They did stick to weekly meetings in which the progress of the project is being discussed. For these meetings they also assigned fixed contacts, which are the two business developers within the start-up. The rest of the team were being relieved from this so they could fully focus on the development of the innovation. There was also a clear distribution of tasks, in which the start-up works on developing the innovation and the co-creation partner keeps in touch with the envisioned customers of the product, which are the customers of the co-creation partner. Next to the hours that were put in, no other agreed dedication of resources between the participants came forward from the qualitative data. There were no contractual agreements made yet between the two partners. At the start of the collaboration, both partners agreed that they would look into that at a later stage: *“We agreed that we would look into this at a later stage, which I found really pleasant at that time. You can divide the cake before you have baked it, but then a lot can still go wrong. It would be a shame if you lose substantial time and energy on agreeing on this in an early stage of development.”*. However, the interviewee also mentioned that delaying these negotiations because of all the potential risks that could make the collaboration fail could be the exact reason that the collaboration might end earlier than expected: *“This is something we definitely need to discuss. Even though you trust each other very well, this could be a bomb under the partnership and we are not quite sure yet how we should handle this.”*

Understanding of the problem context

So far, the envisioned end-users, which are office workers, were not yet involved in the development process. However, there were talks with higher managers within organizations that could become future customers. Throughout the NPD process, their perspective was considered. However, no clear

customer-driven research approaches came forward in the qualitative data. In understanding the use context the current software tool of the co-creation partner was analyzed to investigate what the best possible design for the improved software was. However, this was all in an early stage and very conceptual. The transaction of knowledge was done through online communication, which consists of short updates and discussing the next steps.

Development of concepts and prototypes

In the ideation phase, the partner was heavily involved. Most brainstorm sessions were done together with the co-creation partner. This included both the creation of early concepts as well as creating visualizations of the potential software dashboard. There was no mention of the demonstration of expertise to the customer co-creation partner. However, considering that the partner approached the start-up after the collaboration with the headquarters in Sweden did not work out does show that the director of the Dutch branch of the company had confidence in the expertise and abilities of the start-up.

Validate with the customer co-creation partner

Even though the partnership was still in an early stage, some validation with the co-creation partner has been done. A range of mockups of the dashboard of the software were shown to the partner. The partner also showed these to its customers: *“The co-creation partner has extensive contact with CEOs and other decisions makers within the organization of our envisioned business customers. So the partner mostly takes on the validation with those stakeholders and communicates their feedback to us.”*. These prototypes and the feedback were communicated to each other through online meetings. When using the prototypes, the start-up always had multiple versions to give feedback on. These visualizations gave impressions of potential user interfaces of the software.

Processing feedback

How the start-up processed the acquired feedback and what the influence on design decisions by the co-creation partner was did not come forward from the qualitative data. Their reason for this is that the start-up was not in this stage yet at the time of conducting the semi-structured interview. The same goes for the relevancy of the feedback by the partner. However, from the rest of the interview, it can be assumed that the feedback from the partner is very relevant and valuable because they have extensive experience in the market segment for which the innovation is aimed for.

Continuous advantages of the collaboration

The partners did discuss shortly what the future of the partnership would look like. As said earlier this was not yet agreed upon in detail, but the customer co-creation partner did hint towards starting a joint venture for the purpose of the innovation. This would immediately lead to a long-term collaboration, also after the development process is completed. The potential exposure and validation for the market did not come forward during the interview. This did not apply to the early stage of the collaboration, and no agreements for these activities in the future were made yet.

4.1.5 Case E

Case E covers the customer co-creation partnership between a Dutch hardware development start-up, focused on visually impaired users, and a product development agency, also from The Netherlands. The product development agency is specialized in all phases of the NPD process. The product is currently fully commercialized.

Motivation for the collaboration

The participants in this collaboration did not have an existing relationship at the start of the partnership. The start-up took the initiative on starting the collaboration. They had created a prototype and validated it with their envisioned end-users. However, they lacked the financial means and expertise to turn this prototype into a scalable product. This is why they contacted the co-creation partner. This partner had an impressive track record in going from prototype to product, has worked with many prestigious development companies, and is known for its high-quality products. These qualities needed by the start-up, and after talking with a range of potential partners the development agency seemed like the most complementary partner. The start-up started a yearlong trajectory with the partner in which all phases of an NPD process were walked through, except for the ideation phase, to create the best possible end product. The motivation for the co-creation partner was reward-driven. In exchange for their support in the NPD process and an upfront investment that was needed to scale the production, they received a royalty on each sale. This collaboration is somewhat different from the other cases since it can be argued that in some aspects the start-up can be seen as the customer in this partnership.

Mutual alignment

There was no shared goal or mission present in this collaboration. The start-up aimed to increase the quality of life of visually impaired people, while the development agency saw it as a revenue stream. However, to achieve both goals the outcome of the NPD process had to be successful, so this did not lead to any problems during the project. The start-up presented a realistic perspective on the outcome to the partner during their first meetings. The start-up did not approach the development agency before they had a validated concept that was tested with a range of end-users. After they did take those steps, they communicated this to the co-creation partner and were able to present them with promising results and conversion rates which made their position very strong: *“We set a meeting with them once we had our first 100 customers with a conversion rate of 80% based on a working prototype. Because we had this validation of end-users we had a very strong position because we could provide objective results that there was a market for our innovation.”*. The personal relationship between the participants is something that grew over time and was not spent special time on before the start of the collaboration. However, this did go fluently. The relationship is good and informal, but limited to business activities. The first couple of meetings were done face-to-face on purpose, because of the lack of existing relationship between the participants. In this way, both parties had the opportunity to assess if they could and would want to work together.

Organizing collaboration

There was no specific mention of a clear approach that was followed during the collaboration in the qualitative data. However, looking at the interview as a whole and the description of the collaboration process it can be seen that a structured approach was used where all needed stages were walked through and in which both partners were involved constantly. This can be due to the experience of the co-creation partner in this field. The involvement intensity was high. The partners had weekly meetings, and sometimes multiple meetings per week. These meetings were online. In between meetings, there was also contact through phone calls when additional quick questions arose. There was also a fixed point of contact during the collaboration, from both sides. For both the distribution of tasks and the dedication of resources by both parties in this partnership concrete agreements were made. For the distribution of tasks the outcome was that most stages would be tackled together, because of the complementary expertise and knowledge of both organizations. Outside of the hours spent, there was also an agreement on financial resources that would be assigned to this project by the co-creation partner. Additional agreements were made before starting the development process, but these were not immediately secured in a contract. According to the start-up, it is a misconception that everything in such a partnership is set in stone before starting the collaboration. In the early stages a lot is being done based on mutual trust, also to prevent unneeded costs and time wasted early in the process. Later in the

trajectory, the formal contractual agreements are constructed more and more through NDAs, letters of intent, or other types of contracts. The start-up does prefer face-to-face meetings for those in which verbal agreements are made: *“It considers big deals in which a lot of money is involved, so I want to do those in person. On one hand, that increases the understanding of what someone is saying. Non-verbal communication is being used, which does not transfer well through online meetings. On the other hand, a high level of mutual trust is important in such situations. That is a lot harder to establish through online meetings.”*

Understanding of the problem context

During every step of the process, customer-driven research methods were used. End-users were involved all the time, from gathering their (latent) needs and wants to understanding their perspective on the problem and its solutions. This was initiated by the start-up and was very important to the representatives of the start-up, because of the characteristics of the envisioned end-user. These were visually impaired people, so their perspective is likely completely different than that of people without their impairment. This is also the reason why the start-up insisted on the presence of the co-creation partner in all stages of the development and especially while having contact with the future end-users. Having a good understanding of the use context was vital for the development agency when designing a range of prototypes for the scalable product. The method of transacting knowledge and communicating with the target group while understanding the problem context was not elaborated upon in the qualitative data.

Development of concepts and prototypes

In developing the first prototypes the co-creation partner was not yet involved since the start-up only approach them after they had established a proof of concept. By doing this proof of concept without the partner, and the promising outcome of this trajectory, the start-up demonstrated their expertise and potential to the co-creation partner which made them interested in being involved in the follow-up process. As mentioned earlier, the stages of the development process were mostly walked through together with the co-creation partner. This also included the development of later prototypes. Face-to-face meetings were planned since this was deemed more efficient and beneficial in creating a shared understanding of the product. During these meetings rapid prototyping methods were used, such as using clay or 3D printing, to be able to make fast and small changes to the designs. Considerable time and effort was spent on this and in the end, at least 20 different prototypes were designed.

Validate with the customer co-creation partner

Many different prototypes were designed which differed a lot in their shape and interaction. All designs were tested in the presence of both partners with at least 10 envisioned end-users. It was important for the interviewee that the development agency was present during all these feedback meetings to get an in-depth understanding of the use context and preferences of the target group. This was also done in face-to-face meetings since it was a physical product for visually impaired people. The feedback from these sessions was very valuable in creating the best possible scalable product. Additionally, the expertise of the partner in creating scalable products was also very useful in this stage.

Processing feedback

In the design decisions, the start-up was leading. Of course, the relevancy of the knowledge and expertise of the development agency was acknowledged and taken very seriously, but it did happen on multiple occasions that the partners had different suggestions on some elements of the product. In these situations, the start-up took the final decision, which was occasionally different from what the development agency had proposed. This is one of the aspects in which it can be argued that the start-up can partly be seen as the customer in this collaboration. In the end, the development agency was the one

that handled the production of the product which is the property of the start-up, which makes the start-up a customer of the development agency and therefore has the final say in situations like these.

Continuous advantages of the collaboration

The fact that the production of the product is in hands of the development agency makes that the collaboration is an ongoing one. However, this is not the only thing that continues to connect the two partners. They also recently started a redesign process for the next generation of the product. Furthermore, the owner of the development agency also became a shareholder of the start-up and a personal coach for the founders who advises them on expanding their business. Finally, the collaboration is also used as a validation to other companies: *“We work directly together with the owner of the company. We learn a lot about how to scale a business from him. He is a sort of personal coach for us, which is a great additional benefit of the collaboration. Furthermore, that helps us a lot in achieving additional partnerships. [...] The validation for the market is really important. If such a large company decides to work together with you, other parties also sense that you are doing something right.”* Outside of being a validation for the market, it was not mentioned that the partner plays a role in creating additional exposure for the product or start-up.

4.1.6 Case F

Case F covers the customer co-creation partnership between a software development start-up from The Netherlands that focuses on creating simulation software to accelerate R&D activities and a leader in the OLED industry from Asia. The software is currently fully commercialized.

Motivation for the collaboration

In this case, the customer co-creation partner and the start-up did already know each other through their business network. However, they never collaborated together before this project. The collaboration started because the customer, which is a leader in the OLED industry, became aware of the software that the start-up was working on and saw that it could fill a need that they experienced in their field. The customer approached the start-up with this request, and the start-up was interested to adjust their software to the wishes of that customer. From the interview, it did not seem like the start-up paid too much attention to the qualities of the customer or investigated whether the partners were complementary since the start-up saw the partner as a paying customer. It was only mentioned that it was an advantage that they were an industry leader, which likely comes with a good track record, elaborate domain knowledge, and a big network.

Mutual alignment

In the qualitative data, it also did not come forward that the start-up had constructed a shared goal or mission, or realistic perspective on the outcome of the project for the customer co-creation partner. However, there was considerable attention spent on the personal relationship between the partners before the NPD process started. The communication started formally and the start-up showed respect to the customer in the first encounter, but at the same time the start-up tried to transform it into an informal relationship as soon as possible. This was aimed for by, for example, having face-to-face meetings instead of online meetings: *“Because in physical meetings you can drink some beers together. I’m very serious. Most customer relationships are based on personal relationships. Business is important, but personal relationships are as well. It is not needed to develop a friendship, but it should be close to that. In this way, you will build on the trust in the relationship and lower the barrier to lay contact whenever it is needed.”*

Organizing collaboration

The start-up does use a predetermined structure for a collaboration like this. However, this is not set in stone and is subject to some nuances, such as cultural differences. The start-up finds it important to first learn about the customer co-creation partner before starting the collaboration. In Asia, some European working methods will not work and might even be considered rude. The involvement intensity during the collaboration was based on requests from both sides, but on average the partners had contact a couple of times a month. The start-up does not make use of a fixed point of contact for the business customer, but they are considering doing so in the future because it seems a lot more efficient. The interviewee did not elaborate on the distribution of tasks and the dedication of resources for the partnership. Looking at the complete interview it can be concluded that the complete development was the responsibility of the start-up and that the customer was only asked to spend time on the project during moments of validation and feedback. There were contractual agreements made at the start regarding the intellectual property of the tool and the confidentiality of the process. Both partners insisted that NDAs were signed since sensitive information from both the start-up and the business customer was used and shared throughout the collaboration.

Understanding of the problem context

The start-up aimed to create the innovation based on the needs and wants of the customer by having them involved in the process. The interviewee believes that this is one of the main strengths of a start-up compared to a larger organization. Larger organizations often do not have, or are not prepared to offer, the flexibility that a start-up has in this process. In the qualitative data, it cannot be established what methods were used to get a better in-depth understanding of the use context of the innovation. Considering the transaction of knowledge, the start-up does believe that the distance between the customer co-creation partner and the start-up must be short. This is also achieved by having face-to-face meetings because that contributes to increasing the personal relationship between the partners. Also, it is important to respond quickly to the customer outside of the meetings. By doing this, and by improving the mutual trust in the relationship, the openness and willingness to share by the customer will increase.

Development of concepts and prototypes

The development of concepts and prototypes was done individually by the start-up. They used the needs and wants that they gathered from the customer to demonstrate their expertise in the area of software development. The software itself is hard to understand from an outside perspective, which is also why they have a training trajectory for their customer in which the support team of the start-up will teach the customer how to use the software. The customer is not involved at all in the development of concepts and prototypes, just in the validation and feedback moments.

Validate with the customer co-creation partner

The software was already partly developed before the start of the co-creation process, just not for the market in which the business customer is active. The existing software was used to gather feedback and was then tailor-made for this specific industry. While the software is being used by the customer, there is a constant collection of feedback, since the start-up values the voice of the customer. The communication method is very important due to the difficulty of the software: *“We have a very high-tech product and before the customer actually understands the value of the product we have to educate them on it. [...] This is very difficult, which is why we have a special onboarding training.”* There was no mention in the interview about the use of prototypes that were being used to gather feedback before the software was taken into use by the customer.

Processing feedback

The co-creation partner had a large influence on design decisions that were taken. The start-up always puts the voice of the customer at the center. Especially because the co-creation partner is the leader in the industry, their feedback is considered really relevant and important and the software is being adjusted to their feedback and needs. This is, also now that the software is used by multiple customers, still an ongoing process. Not only the co-creation partner is asked for feedback regularly, but also the other users of the software within the OLED industry.

Continuous advantages of the collaboration

As mentioned earlier, the co-creation partner is currently a paying customer and the software is constantly being monitored for further improvements based on the feedback of the customer. This is a never-ending process. The licensing contract was also recently renewed, so the collaboration will continue for the long term. Additionally, this collaboration was a good validation for the rest of the OLED industry, according to the interviewee: *“When you have such an established company as a client, it is very easy to get the smaller competitors to follow as customers since they use the industry leader as a reference.”*. Furthermore, the partners also collectively published scientific articles regarding the innovation, which also led to additional exposure for the start-up and the software.

4.1.7 Case G

Case G covers the customer co-creation partnership between a Dutch MedTech start-up that focuses on innovating ultrasound technology and a collection of six Dutch hospitals. The innovation is currently fully commercialized.

Motivation for the collaboration

The organizations involved in this collaboration did not have an existing relationship before the start of this partnership. The initiative in the co-creation collaboration between the start-up and six Dutch hospitals was taken by the start-up. They started to call receptions of the hospitals to see if they were interested. From the interested hospitals, the start-up started to analyze their qualities and the different disciplines within the hospitals that would be valuable in the NPD process. Based on this the start-up made the decision on which hospitals they would like to involve in this process. From these different hospitals, a multi-disciplinary and complementary collection of medical experts were approached to take part in this co-creation trajectory. This was very important for the start-up: *“I have a bachelor’s and master’s degree in Industrial Design, and a Ph.D. in User System Interaction, which is nice, but we developed a product for medical experts and we do not speak their language. We do not have the medical expertise that they have, so we could not do this without them.”*. For the hospitals and medical experts themselves, the motivation to take part in this collaboration was the need for an improvement in the ultrasound technology that was previously the standard.

Mutual alignment

Considerable attention was spent on reaching mutual alignment before starting the partnership, also because of the lack of an existing relationship. The participants communicated very openly and honestly about their stance on this partnership and what they would like to get out of this. This not only led to a shared goal that they embraced during the collaboration, but also to a realistic perspective on the outcome of the project. These agreements were also formulated in a letter of intent which was signed at the start of the project. The start-up wanted to create the letter of intent to prevent discussions in the future about the use and costs of the innovation for the hospitals. Also, the personal relationship was valued by the start-up. They believe that the customer co-creation partners should not just believe in the

innovation in order to participate in the collaboration. Believing in the people behind the innovation is just as important. Also, the personal relationship made that during this partnership the participants were very open to helping each other and were open to sharing knowledge and ideas. This resulted in good relationships with multiple of these medical experts, years after the NPD process was completed.

Organizing collaboration

The start-up described the approach structure of the collaboration as ‘learning by doing’. There was not a predetermined structure that was followed during the trajectory, with the exception of some structured sessions in the ideation phase and validation phase. Further on in the project, the collaboration became increasingly structured, but only after the product development and product launch stages. The involvement intensity was based on the progress that was made on the innovation. The partners were involved regularly in the ideation phase. Also, when the start-up had new features that they wanted to test they went to one of the hospitals to do this together with the medical experts, which was normally once every two or three weeks. For the meetings and additional contact, the start-up did not assign a stable point of contact. The reason for this is that the start-up consisted of just three people who were always informed on the latest updates of the project and they did not see the added benefit of the fixed point of contact for this purpose. Looking at the dedication of resources and the distribution of tasks between the partners, it became clear that the medical experts of the hospitals invested their time to test prototypes together with the start-up and give their feedback on this. All other activities related to the development of the innovation were the responsibility of the start-up. The start-up was satisfied with this arrangement since they appreciated the time of the medical experts, who often have a very busy schedule. As mentioned earlier this was also formulated in a letter of intent. The contents of this letter of intent covered the agreements on the intellectual property of the innovation, and the intellectual property of other innovations that could have been discovered during the process, the amount of time the medical experts would spend on the co-creation collaboration, and the price the hospital would have to pay once the technology was completed.

Understanding of the problem context

The interviewee is convinced that the involvement of customers must happen before doing any development activities. It is important to understand the problem context before starting to come up with solutions. This was done by a range of customer-driven research methods, including in-depth conversations about the current situation and the problems that arise. In these meetings, the start-up continued to ask follow-up questions to unveil the latent needs of the business customers. The start-up was also present with at least two people at each meeting. One led the conversation while the other made notes and thought about additional questions that could be asked. To get a good understanding of the use context, the start-up also shadowed the medical experts during their working day. Listening to the medical experts was crucial for the start-up, they believe that this is the most important when developing an innovation. To optimize the transaction of knowledge in this phase even more, the start-up did elaborate additional research on the medical side of the innovation that the experts talked about: *“From their side, they talked a lot about the aortic valve and more difficult medical terms. We took notes and learned about them afterwards in books and through the internet. It is important to spend considerable time on this. Understanding your customer is the most important thing there is. You are very lucky if a customer is willing to spend their time and knowledge on you.”*

Development of concepts and prototypes

To involve the partners in the ideation stage, the start-up organized several co-creation sessions in which the medical experts from all different hospitals met face-to-face with the start-up. They then had exploratory meetings about the needs and wants of the customer and about the problems they experience with the current way of working. As said earlier, the start-up is convinced that the best products are made in close collaboration with the customer and that the customer must be involved long before the

first prototypes are developed. There was no mention in the qualitative data on the demonstration of expertise by the start-up.

Validate with the customer co-creation partner

When the start-up created new prototypes they visited the customer face-to-face to test the prototypes together and gather feedback. This was an iterative cycle, in which every two or three weeks feedback on improved versions of the innovation was gathered which took them closer and closer to the final design. In some cases, multiple prototypes were validated at once: *“Sometimes we would test multiple prototypes in parallel. For example, we could have three prototypes ready for the same feedback session. The most valuable characteristics of all prototypes would then be collected and combined into one or two new designs for the next validation meeting.”* For the communication method in this phase, the start-up preferred face-to-face feedback sessions, since tests were also to be done together with the medical experts in these meetings. The start-up also believes that physical meetings drastically increase the shared understanding between the partners and prevent miscommunication. During these meetings, the start-up also prevented going into too much detail on the technical development side of the innovation. This information is irrelevant to the customer and only makes it more difficult for them to follow.

Processing feedback

In most cases, the feedback of the co-creation partner was leading to the design decisions that were taken. However, there was one exception during this partnership. Sometimes, the medical experts asked for functionalities that are technically impossible. In the area of product development, the start-up has a lot more knowledge and expertise. In situations in which the start-up was convinced that a certain customer ask was impossible to work out, it trusted in its own expertise and convince the customer of this. So the relevancy of the feedback by the customer depended on the area of expertise that it applied to. On the medical side and the UX/UI side the medical experts were leading.

Continuous advantages of the collaboration

After the NPD process for this innovation was completed, the partners kept collaborating in multiple areas. With some of the hospitals other development projects were started, which are currently running. The start-up also launched an ambassador structure, in which some of the customers became official ambassadors of the start-up. Additionally, this partnership was also valuable in achieving validation for the rest of the ultrasound market. The market is very niche, and organizations communicate a lot with each other. This resulted in many interested organizations who heard about the success of the innovation. Finally, the innovation was also presented at an international congress together with one of the hospitals that was involved in the process. This also led to exposure outside of the operating market.

4.1.8 Case H

Case H covers the customer co-creation partnership between a hardware development start-up that focuses on multispectral imaging and players from the fluorescence microscope industry. All involved organizations come from The Netherlands. The innovation is still in an early stage of development.

Motivation for the collaboration

The start-up is currently working on creating multispectral imaging cameras for two different sectors. For this purpose, the start-up approached the market leaders in these two sectors to involve them in the new product development process from the very start. The start-up had multiple criteria that decided which companies they were to approach. A number of these criteria were mentioned by the interviewee:

“Multiple factors are of importance. How open is the partner to innovations? What is their budget? How big is their current need? Are they a market leader? These are some of the criteria we look at.”. The start-up found that there is a common need among the companies, which is also why those companies were willing to be involved in this customer co-creation partnership. There was no mention in the interview of the importance of finding a complementary partner for the collaboration. The driver of motivation from the customer’s perspective was the unfulfilled need that they experienced in this area in the current market.

Mutual alignment

The start-up finds it important to discuss a shared goal and a realistic perspective on the outcome together with the co-creation partner. Both organizations should in the end benefit from the collaboration, so it is a priority to make this clear at the very start. All participants take certain risks by starting this trajectory, so clear and open communication about the outcome and the goals of the project must take place. The personal relationship with the customer is subject to who is in on the other side of the table. That can vary a lot from person to person. However, the start-up believes that it is important to create a certain connection between the partners. This is a lot easier to establish when the relationship is more informal. In collaborations like these, the likability factor is also of influence. Especially when there is no existing relationship present, this is a crucial stage of starting the collaboration.

Organizing collaboration

A structured approach was followed during the NPD process. Before the collaboration started, the start-up discussed with the partner what the process must look like and what they wanted to achieve in a certain period. Also before every meeting, it is discussed what the purpose and preferred outcome of the meeting are for each participant. The involvement intensity depended a lot on the phase of the process. On average, they have contact with each of the partners once a month. For this contact, the start-up tried to do most of the communication with the partners through a stable point of contact. However, it is still important to involve the whole team in this situation, because in the start-up everyone was closely involved in the project and had multiple roles within the organization. The tasks of the co-creation partners in this collaboration consisted of being involved in the ideation stage and in revealing the needs and wants of the market. Additionally, they were heavily involved in gathering feedback on concepts and prototypes. The development of the innovation itself was fully on the shoulders of the start-up. Outside of the time spent, there was not elaborated upon what other resources are dedicated to the partnership by each organization. The start-up let the customer co-design partners sign an NDA for the technology behind the innovation: *“During the general discussions at the start we do not ask the partner to sign anything, but we will not talk about the technology in detail until we have a signed NDA from the collaborator.”*. The start-up also thought about setting up a contract on additional agreements, such as the price the customers will have to pay once the product is finalized, but they were not in that stage yet.

Understanding of the problem context

The start-up finds it essential to involve the customers as early as possible. The developers must be fully aware of the problem context and the needs and wants of the customer before they start to develop anything. For this purpose, the start-up made use of customer-driven research methods, such as in-depth discussions on the current situation of the partners and finding out their (latent) needs and wants by asking follow-up questions. They did this with multiple players in the sector to find out what the common needs were. Also, the start-up preferred to meet at the location of the customer. This way, they got a much better understanding of the use context of the innovation, because some information can only be gathered by experiencing it and not by asking the customer co-creation partner about it. All other meetings were also preferably face-to-face because the start-up believes this increases the

efficiency and understanding of the transaction of knowledge. However, because of the COVID-19 measures, many of their meetings were online.

Development of concepts and prototypes

In the ideation phase, the start-up heavily involved the customer co-creation partners. The start-up is convinced that the involvement of customers in the early stages of the process leads to better products in the end. Many start-ups make the mistake of first developing a certain innovation, and only start testing if there is a need for it after that. The start-up believes that it makes a lot more sense to do this in the opposite order. There was no mention of a demonstration of expertise by the start-up. This can also be a result of the stage of the collaboration, in which no high-quality prototyping was done yet. The development of prototypes was limited to rapid prototyping, for example, quick visualizations on paper.

Validate with the customer co-creation partner

The start-up values the feedback of its co-creation partners. When there were developments in the process, the start-up always set up feedback sessions with the customers to ask their views on it. For this purpose, the start-up also used prototypes. These prototypes consisted of rapid prototypes, such as visualizations on paper. In these meetings, the start-up mostly showed one or two different prototypes to get feedback on, since they do not see the purpose of having a wider range of concepts or prototypes: *“I get the feeling that when you show a customer many different options, they lose sight. We always try to keep it concrete with little variations. If you go to a shop and can choose from 100 different options, it makes the choice very difficult. If there are only two options on the table, it is a lot more concrete and the choice gets a lot easier.”*. During these meetings, the start-up also preferred face-to-face sessions because it makes the explanation of concepts and prototypes a lot easier. But this was not always possible due to the lockdown.

Processing feedback

In the design decisions, the customer co-creation partner was leading. They are the ones that eventually have to buy the innovation, and they know best what they like. This is why they had the most influence on the characteristics of the product. Their opinion is also relevant because they have a lot more domain knowledge and experience in their market segment. This is something that the start-up does not have.

Continuous advantages of the collaboration

After the new product development process is finalized, the start-up also sees potential in additional advantages of the collaboration. They already talked with the partners about a potential long-term collaboration on the marketing of the innovation. Then the customer co-creation partners will help in the validation for the complete market, by showing that the innovation is very valuable for the co-creation partners. Additionally, there are also plans to go to international congresses and markets where the partners will raise exposure for the new technology which will benefit the brand awareness for the product and the start-up as a whole.

4.2 Cross-case analysis

In this cross-case analysis, the findings of all qualitative data were combined into a complete overview and understanding of the mentioned concepts in the reviewed cases. The second-order themes were once again used as headers to organize all findings. An overview of all identifications of the concepts constructed in the data structure in the researched cases is shown in *table 3*. This table shows whether the first-order concepts were discussed during the semi-structured interviews or mentioned in the observational data. A green checkbox means that the concept was discussed in de qualitative data of the case, and implemented or thought about during the process of the collaboration. A red checkbox means that the concept was discussed in the qualitative data of the case, but was not properly implemented or thought about during the process of the collaboration. A white checkbox means that the concept did not turn up in the qualitative data of the case and that it was not possible to determine whether it played a role during the collaboration.

		Recognized by								
		Case A	Case B	Case C	Case D	Case E	Case F	Case G	Case H	Total
Motivation for the collaboration	<i>Existing relationship</i>	Green	Green	Green	Green	Green	Green	Green	Green	8
	<i>Qualities of the co-creation partner</i>	Green	Green	Green	White	Green	White	Green	Green	6
	<i>Complementary partners</i>	Green	Green	Green	Green	Green	White	Green	White	6
	<i>Customers' driver of motivation</i>	Green	Green	Green	Green	Green	Green	Green	Green	8
Mutual alignment	<i>Shared goal and/or mission</i>	Green	Green	Green	Green	White	White	Green	Green	6
	<i>Realistic perspective on outcome</i>	Green	Green	Green	Green	Green	Green	Green	Green	6
	<i>Personal relationship</i>	Green	Green	Green	Green	Green	Green	Green	Green	7
Organizing collaboration	<i>Involvement intensity</i>	Green	Green	Green	Green	Green	Green	Green	Green	8
	<i>Structured approach</i>	Green	Green	Green	Green	Green	Green	Green	Green	8
	<i>Learning by doing</i>	Green	Green	Green	Green	Green	Green	Green	Green	8
	<i>Dedication of resources</i>	Green	White	Green	White	Green	Green	Green	White	4
	<i>Distribution of tasks</i>	Green	Green	Green	Green	Green	White	Green	Green	7
	<i>Point of contact</i>	Green	Green	White	Green	Green	Green	Green	Green	7
	<i>Contractual agreements</i>	Green	Green	Green	Green	Green	Green	Green	Green	8
Understanding of the problem context	<i>Customer-driven research methods</i>	Green	Green	Green	Green	Green	Green	Green	Green	8
	<i>Understand use context</i>	Green	Green	Green	Green	Green	White	Green	Green	7
	<i>Transaction of knowledge</i>	Green	Green	Green	Green	White	Green	Green	Green	7
Development of concepts/prototypes	<i>Demonstration of expertise</i>	Green	Green	Green	White	Green	Green	White	White	5
	<i>Involvement during ideation</i>	Green	Green	Green	Green	Green	Green	Green	Green	8
Validate with co-creation partner	<i>Feedback on process</i>	Green	Green	Green	Green	Green	Green	Green	Green	8
	<i>Communication method for validation</i>	Green	Green	White	Green	Green	Green	Green	Green	7
	<i>Use of prototypes</i>	Green	Green	Green	Green	Green	White	Green	Green	7
Processing feedback	<i>Influence on design decisions</i>	Green	Green	Green	White	Green	Green	Green	Green	7
	<i>Relevancy of feedback</i>	Green	Green	Green	White	Green	Green	Green	Green	7
Continuous advantages of collaboration	<i>Exposure</i>	Green	White	Green	White	Green	Green	Green	Green	5
	<i>Ongoing collaboration</i>	Green	Green	Green	Green	Green	Green	Green	Green	8
	<i>Validation for the market</i>	Green	Green	Green	White	Green	Green	Green	Green	7

Table 3 – Identified concepts per case

4.2.1 Motivation for the collaboration

In general, it was clear that when a start-up and a customer were looking to start a partnership the complementarities between both parties were crucial. The distinctive qualities of the customer co-creation partner were an important assessment method for start-ups to decide whether they would want to collaborate. These qualities included the relevant network of the partner, the domain knowledge of the partner, and the track record of the customer co-creation partner. The driver of motivation to participate in the collaboration from the perspective of the customer differed, but was mostly because of an unmet need that they experienced in their former situation.

When looking at the qualitative data in more detail it can be seen that in 2 of the 8 cases the partners had an existing relationship. The presence of an existing relationship had an impact on the personal relationships throughout the collaboration. In case C it was mentioned that the good relationship both partners had before the start of the collaboration contributed greatly to the ease of formulating agreements and common goals for the project. Contrarily, the lack of an existing relationship could lead to the need to perform additional efforts in building mutual trust and finding out the intentions of the partner. Additionally, in 6 out of 8 cases the start-up took the initiative in starting the collaboration. The other two times, the customer became aware of the activities of the start-up and reached out to see if it was possible to tailor-make the innovation for their sector. Furthermore, in 6 out of 8 cases the qualities of the customer co-creation partner played an important role in deciding if a collaboration would be beneficial from the perspective of the start-up. These qualities were, among others, the domain and end-user knowledge of the customer, the track record of the customer and the relevant network of the customer. In the two cases in which the qualities of the customer were marked with a white checkbox, the qualitative data did not make clear whether this was considered. In one of those cases, case F, the initiative for the collaboration came from the business customer and the start-up saw it as a request from a paying customer to which they would comply. This could be why neither the qualities of the customer nor the question if both parties would be complementary partners were considered in this case. In total 6 out of 8 cases did let the decisions of whether or not to start a collaboration depend on the complementarity of the partners. In case F and case H it was not clear if this was considered. In all other cases it became clear that the qualities of the customer co-creation partner or the search for a partner that is complementary to the start-up's abilities was seen as a crucial step in setting up a partnership. This is nicely formulated by the interviewee from case C: *"Then you see that we are actually really complementary to each other, that we fit together well. Only if that is the case, a possible co-creation partnership becomes a possibility."* In all eight cases, the driver of motivation from the customers' point of view became clear. However, that driver varied among the different collaborations. In five cases, the driver of motivation was the need that the partner experienced in the current market environment. In three collaborations the driver of motivation for the customer can be seen as an intrinsic interest in the innovation. In three partnerships, the driver of motivation for the partner can be defined as reward-oriented. This adds up to a total of more than eight, which is because in some instances the driver of motivation for one customer co-creation partner could be assigned to two different options.

4.2.2 Mutual alignment

Overall, it can be seen that in all but one partnerships attention was paid to creating mutual alignment. Each of these start-ups paid special attention to developing a personal relationship with the customer co-creation partner and agreed that a more informal relationship was preferred during the collaboration. The reasons that were given by the interviewees why this is seen as an important activity by their start-

up is because this could potentially give a boost to the mutual trust between the participants, lower the barrier to lay contact whenever needed, and increase the willingness to share information. The attention that was spent on creating a shared goal and/or mission differed among the cases. Finally, it was seen that providing the customer co-creation partner with a realistic perspective on the outcome of the NPD process was experienced as important by the start-ups.

The collected data revealed that the start-ups used different ways to create mutual alignment. When looking at the qualitative data more in-depth, 4 out of 8 partnerships showed that a clear shared goal and/or mission was discussed at the very start of the collaboration. In 2 out of 8 cases there was no time spent on this aspect of mutual alignment and in the last two instances, it was not clear from the data if special attention was spent on this. All of the interviewees that reported to have spent specific time on creating a shared goal and/or mission mentioned that they believe that this was crucial in setting up a successful customer co-creation partnership. Looking at discussing a realistic perspective on the outcome of the project together with the business customer, it can be seen that in 6 out of 8 cases attention was paid to this. Among these six cases are all cases that spent additional attention to achieve a shared goal and/or mission for the partnership. For the remaining two cases it did not become clear from the qualitative data whether this was discussed or not. Finally, 7 out of 8 cases paid attention to building a personal relationship with the customer co-creation partner. All interviewees from these seven cases agreed that it was a very important aspect of the collaboration. The type of personal relationship depends on who the partner is, but in all situations it can help to build the mutual trust between the participants, lower the barrier to contacting each other, and increase the willingness to share information. It was also frequently mentioned that a good personal relationship could increase the commitment of the partner to spend time on the collaboration and achieve the best possible result. The lack of attention on all three of these aspects in case A resulted in problems later in the collaboration between the two partners. A couple of months into the collaboration the customer co-creation partner in case A was worried about the focus and envisioned end goal of the start-up in the project. The customer was unsure if the start-up was fully committed to solving their issues and making the innovation tailor-made for them. This worry was also communicated towards the start-up, and both parties had an elaborate conversation on this topic. Both partners talked it out and made their intentions and goals clear towards each other, which increased the mutual trust in the partnership. However, this could have been avoided if this was discussed earlier in the process. The only other case in which one of the aspects of mutual alignment was not implemented in an early stage, case D, did not experience any problems as a result of this: *“Up until now it was very logical what the next steps were. We did not have any endless discussions or differences of opinions on this yet.”*. But it has to be taken into account that the collaboration of case D was just in the early stages of development. All other cases, in which there was specific attention spent to achieve mutual alignment, did not report any issues that could be linked to this second-order theme.

It is noteworthy that in 4 out of 5 start-ups in which the manager or founder had previous business co-creation experience attention was paid to both achieving a shared goal and/or mission and providing the customer co-creation partner with a realistic perspective on the outcome of the collaboration. Additionally, one or both of these concepts were not addressed in partnerships of all three start-ups in which the founder or manager did not have previous experience in business or customer co-creation.

4.2.3 Organizing collaboration

In general, many up-front organizational activities were performed in each of the cases. Especially the involvement intensity of the partner in the NPD process and the distribution of tasks between the participants was well defined among almost all partnerships. This contributed to increasing the efficiency of the collaboration and gave all participants a better understanding of their role within the partnership. However, the extent to which a structured approach was present differed greatly between the start-ups. Additionally, while there was no obvious resemblance between the cases regarding the

dedication of resources, this was evident in the distribution of tasks for which all but one start-up mentioned having discussed this with their co-creation partner. Finally, a difference in approach can be seen among the start-ups regarding a the stable point of contact and contractual agreements before the start of the development process.

From the data, it was clear that the degree to which the start-ups made these collaboration preparations differed. When looking at the first-order concepts in detail, it was seen that arrangements regarding the involvement intensity of the customer in the NPD process were discussed upfront in all eight cases. This covers both the frequency of contact and clarity on the stages of the process in which the contact was present or was higher. In 7 out of 8 cases, the frequency of contact was determined by setting returning meetings, ranging from once per week to once per month. In one case, case F, the contact was based on requests and thus not on fixed times. There was a difference between the cases regarding the structure of the collaboration. The qualitative data from 5 out of 8 cases reported that a pre-determined structure was set up for the whole process, while 2 out of 8 cases reported that a structured approach was lacking and it was a process of learning by doing. Case A was the only case from which it could be concluded that there was a clear combination of the two approaches present. However, the qualitative data of all cases in which a pre-determined structured approach was established hinted that in some cases it was needed to deviate from this approach since high flexibility is required to successfully manage uncertain and exploratory activities, such as those in a new product development process, and the possibility of unexpected turns which require adaptations were very likely. Interestingly enough, it was seen that for 2 out of 3 start-ups that used the learning by doing approach this was their first customer co-creation collaboration experience. Supporting this finding, it was also seen that in 4 out of 5 cases in which the start-up used a pre-determined structured approach the interviewee had previous business or co-creation experience. The dedication of resources by participants in the partnership was discussed in 4 out of 8 cases, in which all interviewees from those cases confirmed that there were agreements made on this at the start of the process. In the remaining four cases it was not discussed, which could be because 3 out of those 4 cases were in the very early stages of the collaboration. The start-up from the remaining case, case F, signed a NDA with their partner which prevented them from sharing in-depth information about the agreements. In three cases this agreement on the dedication of resources covered the time spent by the partner on the project. In one case, case E, both the time spent on the project and a monetary investment was agreed upon. The distribution of tasks during the collaboration was clear in 7 out of 8 cases. In the case in which this was not clear from the qualitative data, case F, the collaboration was between the start-up and its paying business customer. This suggests that the most time-consuming tasks were performed by the start-up in exchange for financial compensation. The nature of the distribution of tasks in the other cases is clearly linked to the involvement intensity of the customer co-creation partner which was discussed earlier. It was seen that in stages in which the partner had been assigned tasks, the involvement intensity was also higher. These tasks ranged from ideation and validation activities to marketing efforts for the innovation.

Another interesting finding was whether the start-up had assigned a stable point of contact for the customer co-creation partner throughout the collaboration. In 5 out of 8 cases the start-up did assign a fixed point of contact. Reasons given for this decision were that it could increase the focus on developing the innovation for the rest of the team, build a stronger relationship with the business customer, increase consistency, and decrease the chance of miscommunication. It did become clear from the qualitative data that it was important to keep the whole team updated and to regularly have planned meetings with all involved participants and not just the stable points of contact. In 2 out of 8 cases the start-up did not assign a point of contact, in case F and case G. In case F, the interviewee mentioned that this is something that they were thinking of doing in the future because they see the added value that it could bring. For case G, the interviewee did not think it would be beneficial. In this collaboration, there were three employees of the start-up involved in the NPD process, and all three had

around the same amount of communication with the partners. In case C it did not follow from the qualitative data whether or not a stable point of contact was assigned. However, it was clear from the data of that case that one of the two co-founders had an existing relationship with the partner and was the most involved in the collaboration from the side of the start-up. There was a clear division in the cases regarding contractual agreements made at the start of the collaboration. From the qualitative data, it was seen that in 5 out of 8 cases there were indeed contractual agreements made. This was done to protect the intellectual property of the inventions made during the collaboration, to make sure that no confidential information was shared, to make agreements on the financial compensation for each party, and to formally capture the dedication of time and resources to the project. It was seen in all cases that mutual trust was an important aspect in this, but that often either the start-up or the customer wanted to have a formal contractual agreement as a big stick. In 3 out of 8 cases no contractual agreements were made from the start. This was done because the participants believed that the mutual trust between the start-up and the business customer was sufficient in the early stages of the process. Other reasons that are mentioned in both case E and D were to prevent the financial costs from exploding before the collaboration had even properly started and that it was, according to the interviewee of case D, not possible to ‘divide a cake which you have not baked yet’. In both case C and case E informal oral agreements were formalized into a contractual agreement at a later stage of the development. The only case in which no contractual agreements were set up is case D, because they did not reach that stage yet. The interviewee from case D does worry that having procrastinated this difficult discussion might lead to problems later in the collaboration: *“This is something we definitely need to discuss. Even though you trust each other very well, this could be a bomb under the partnership and we are not quite sure yet how we should handle this.”*

It is interesting to note that in both cases in which the collaborators had an existing relationship prior to the partnership it was not mentioned that a stable point of contact was assigned. A reason for this might be because the participants already had a personal history and assigning a stable point of contact to establish an increased level of mutual trust and improve the personal connection between the partners was therefore redundant.

4.2.4 Understanding of the problem context

After all the preparations for the collaboration were in place, understanding the problem context was an important next step in the NPD process. In each of the cases significant time was spent on understanding the problem or gap in the market that the innovation should address. All start-ups involved their customer co-creation partner in these activities. Many start-ups used customer-driven research methods as a means to understand their challenge and the use context of the to be developed innovation. A smooth transaction of knowledge was also properly implemented by most of the start-ups, in which the majority of them mentioned that they preferred face-to-face meetings for this transaction of knowledge to increase the understanding of the situation of the customer co-creation partner.

Watching the qualitative data more closely, it was seen in 7 out of 8 cases that the interviewee mentioned the use of customer-driven research methods. The goal of these customer-driven research methods was to get a good insight into the hidden needs and values that apply to the customer by giving room for freedom and imagination in the discussions on these topics. The start-ups used a range of techniques for this purpose, but it mostly considered open-ended discussions in which the customer co-creation partner was invited to take initiative in sharing information in both verbal and visual form while the start-up would listen closely and ask follow-up questions on the input of the customer co-creation partner. The start-up in case A and case B also arranged value-sensitive design workshops with their business customers for this same purpose. It is also seen that in 7 out of 8 cases the use context was further investigated. This was also achieved

through close contact with the customer and by asking them about their current situation and discussing how the innovation would be placed in this environment. 5 out of these 7 cases mentioned a clear preference for face-to-face meetings for increasing the understanding of the use context. The reason for this was because a far more clear image can be gathered through face-to-face meetings, especially when the representatives of the start-up could see the working environment in which the innovation would be placed with their own eyes. In three cases there were specific arrangements made that the start-up could walk along with the customer for a day, so they can fully understand their daily problems and the opportunities that these bring. This was also nicely captured from the qualitative data of case A: *“We asked for a face-to-face meeting at the location of the co-creation partner. The reason is so we can get a better understanding of their working environment and the possibilities we can make use of when implementing the innovation, which is of great value.”*. This was also reflected in the transaction of knowledge that was performed during this stage. 7 out of 8 start-ups thought about the way they would want to perform this knowledge transfer. It was noticed that, when the innovation was a software for which no physical interaction was needed while using it, the communication during the phase of understanding the problem context was performed largely through online meetings. When the innovation required a physical activity by the customer when it would be used, it was seen that already in the early phases of development more face-to-face meetings were being made. It should also be taken into account that 6 out of 8 partnerships were (partly) conducted during the COVID-19 pandemic, which might also affect the amount of online meetings.

4.2.5 Development of concepts and prototypes

It was seen that all but one start-up involved the customer in the ideation phase. This means that the partner was actively involved in brainstorming and thinking along with the start-up on concepts and fast and easy prototypes that could address the identified problem context. The data also showed that none of the start-ups involved the customer in the development of high-end prototypes which were later used for validation. This activity was used by many start-ups to demonstrate their experience in the development of these products or services to the customer. This demonstration of expertise could increase the trust that the customer has in the start-up and the belief that the NPD process will be completed successfully.

When addressing the two first-order concepts in more detail, it is seen that in 5 out of 8 cases the presence of a demonstration of expertise was clear from the obtained qualitative data. In the other three cases, this was not identified. This demonstration of expertise was carried out through different means. These included showing the business customer the qualities the start-up had in the area of development, inviting the customer to the workplace of the start-up, and facilitating well-prepared ideation workshops for the business customer. Next to involving the co-creation partner to understand the problem context, figuring out their (hidden) needs and wants, and formulating the requirements for the innovation, it was seen that in 7 out of 8 partnerships the customer co-creation partner was actively involved in the ideation phase in which the partners would brainstorm together about specific solutions to the identified problem. Some start-ups even called the involvement of the customer in this phase ‘crucial’. The interviewee of case G also said: *“I have experience in this, and I am convinced that by involving the customer in the ideation phase you can create a far better product for the customer.”*. The only case in which this was not done was case F. The reason behind this was the high difficulty of the software that was being developed and the in-depth understanding of the software that was needed to properly understand it, according to the representative of the start-up from that collaboration.

4.2.6 Validate with the customer co-creation partner

The process of validating the concepts and prototypes with the customer was also investigated. The data showed that all researched start-ups frequently asked for feedback from the customer co-creation partner during the development process. During these validation sessions, it was important for the start-ups to have a shared understanding of the innovation between themselves and the business customer. This was aimed for by making sure the taught process behind the development was clear so that the most valuable feedback was collected. This is increasingly important when the innovation had a high level of complexity in an area in which the customer co-creation partner was no expert. This was why most start-ups preferred to do these feedback sessions face-to-face, to be able to explain everything properly and answer possible questions that arose. These physical meetings were also important because prototypes were extensively used during these sessions. These prototypes were easier to show, experience, and make quick adjustments to when all participants were physically present in the same room as the prototypes, especially when the prototype was not a software.

It became clear that the view on the validation phase was very similar in all cases. Looking at the data in more detail it was seen that 8 out of 8 cases made use of regular feedback sessions. This was an iterative activity in which the feedback on a concept or prototype was gathered, the concept or prototype was adjusted based on the feedback, and a new feedback meeting for the improved artifact was held until the innovation was fully developed. In 7 out of 8 cases the type of communication for these validation activities was also discussed. For each of the four innovations which required offline interaction with the developed product, the start-up had a preference to do these meetings face-to-face. For the cases in which the innovation was purely a software that would be interacted with online, no preferred meeting method was mentioned by all but one of the interviewees. The innovation of case F was purely a software tool, but because of the high complexity of the software the interviewee also would rather have the feedback meetings offline. According to the interviewees that preferred an offline meeting over an online meeting, being in the same room as the customer co-creation partner increased the shared understanding of the innovation and prevented misunderstandings. Another important aspect was whether the communication was purely verbal or if also visual tools were used in communicating the idea. 7 out of 8 cases specifically mentioned to have used prototypes to communicate the progress that was made. Case F was the only partnership in which this was not specifically confirmed, but looking at the overall process and the activities within the collaboration it was very likely that also in this NPD process prototypes were used during feedback sessions. It was mentioned in different cases that, especially with innovations that went beyond purely a software, the face-to-face meetings were crucial in letting the customer properly experience and understand the prototypes. Depending on the stage of the development small adjustments to the prototypes were also made during these feedback moments on some occasions, such as in case E: *“For hardware innovations, physical meetings are a lot easier to clarify and tweak things. In the beginning, we worked a lot with clay models, which can be adjusted very easily together with the customer.”*. There was a clear difference in the number of prototypes that were used per meeting. Most start-ups purposely showed multiple concepts or prototypes so that the customer could highlight the most preferred characteristics of each of the artifacts. However, the interviewee of case H said that he was a fan of using one or two prototypes at the same time to make the feedback more detailed and focused.

4.2.7 Processing feedback

After gathering the feedback from the customer co-creation partner their input was processed into the next iterations of the innovation. Both the relevancy of the feedback of the customer for the start-up and

the influence that the input of the co-creation partner had on the design decisions were discussed in almost all cases. The relevancy of the feedback was in all of these cases graded on corresponding aspects. The customer co-creation partner had a lot more knowledge of their needs, wants and current situation, or those of the envisioned end-user, than the start-up had. Additionally, the partner had a large relevant domain network and a high level of domain knowledge in all of the cases. This made that the start-ups overall took the feedback from their partner very seriously. This also resulted that the business customer had the final say on (a part of) the design decisions that were taken throughout the NPD process in almost all collaborations.

The role of the customer was seen as very important in this stage. More specifically, 7 out of 8 cases discussed the relevancy of the feedback of the customer co-creation partner in the qualitative data. Only in case D this was not discussed, because they were too early in the NPD process to use the feedback of the business customer for iterations of the innovation. In all of the seven cases, the feedback of the partner was seen as important and relevant due to their qualities and track record. This is nicely captured by this quote of the interviewee in case C: *“The specific knowledge that we lack, [...], is the knowledge that the customer co-creation partner does have. Additionally, the partner has a huge network in this field.”*.

In these same 7 out of 8 cases, excluding case D for the same reason mentioned before, the customer had a great impact on the design decisions that were taken. In five collaborations, the start-up mentioned that the opinion of the customer co-creation partner is even leading in these decisions. In case G the influence on these decisions between the partners was more balanced: *“Sometimes you know that you have more knowledge and expertise in product development than the customer has. You should also rely on your own insights and experience when you think that is best. It is important to find a good balance in that.”*. In case E, the start-up had the final say on important design decisions. This also fits in the narrative, because in this partnership the start-up had more knowledge of the situation of, and requirements from, the end-user than the co-creation partner had.

4.2.8 Continuous advantages of the collaboration

Finally, the additional advantages that the collaboration brought next to the actual development of the innovation were investigated. It was seen that most partnerships provided exposure for the start-up and its activities. This exposure was obtained through marketing efforts, publishing scientific articles, and/or visiting (international) scientific congresses together with the business customer. In all cases, it became clear that the collaboration between the partners continued after the NPD process was completed. The reason behind this ongoing collaboration differed, but included redesign projects, the creation of other innovations, marketing efforts, and setting up joint ventures. Additionally, in all but one instance, the collaboration was also used, or is planned to be used, as a validation for the market. The success of the collaboration was often used to show the effectiveness of the developed innovation to the outside world. Furthermore, the interviewees mentioned that if competitors of the customer co-creation partner were aware of the collaboration it became easier to also seize these competitors as additional customers.

More precisely, in 5 out of 8 partnerships the qualitative data showed that the start-up used the exposure from the collaboration as a means to increase their brand awareness. In 2 out of the 3 cases in which this did not come forward the partnership was in a very early stage, which could mean that the start-up did not make plans for this yet. However, this does not exclude the possibility that it does happen in the future. In three collaborations this was done, or planned to be done, by visiting (international) congresses and fairs in the sector relevant to the innovation. In all of these cases, the customer co-creation partner would also attend to these events. Another case, case F, mentioned that scientific articles were published together with the partner on the innovation that was developed. Two start-ups

even mentioned that extensive marketing strategies were set up to gain exposure for the innovation. All eight partnerships mentioned that the collaboration is ongoing and will be long-term. The nature of this long-term collaboration did differ a lot between the cases. In two cases marketing efforts were performed by both partners in exchange for a royalty deal for the business customer. For three partnerships the NPD process was not yet completed, while three other cases mentioned that they were working with their customer co-creation partner on a redesign of the innovation or a new NPD process. In 7 out of 8 collaborations it was seen that the start-up used the collaboration to validate its innovation for the market, or was planning to do so. Only in case D this was not discussed, which could be due to the early stage that the collaboration was in. Throughout the collaboration, the customer co-creation partner might also have discussed the partnership with their network. The co-creation partner of case B was introduced to the start-up by the co-creation partner of case A because of this, as can be seen in the observational data of case B: *“The customer co-creation partner was introduced to the start-up through an e-mail from the professional football organization. The start-up was not aware of this, but was later approached by the customer co-creation partner which became interested in the innovation for their situation.”*. Case G also mentioned word-of-mouth as an important validation method. This made sure that most organizations within the same market as the co-creation partner were aware of the innovation, which prevented the start-up to suffer from cold-calling. Case C mentioned that they used the positive outcomes from user tests to show the effectiveness of the innovation for the new target group. Two other cases mentioned that not only the working innovation but also the collaboration itself was an important validation for other organizations. Since start-ups most of the time do not have any track record, other market players found it important to see that the start-up was able to collaborate with an established company which increased the credibility of the start-up according to the interviewee of case E: *“One of the most important things is the validation for the market. When such a large organization works together with a start-up like ours, other organizations see that we are good at what we do.”*

5. Discussion

In the results section, extensive insights were obtained from a range of case studies. The most important and surprising findings of this research will be reflected upon and compared against existing literature in the theoretical contributions. Then, the practical implications will be shown in which a visualization of the identified step-by-step process of the customer co-creation collaboration is presented and the most important actionable knowledge that arose from this research is presented to the readers of this paper. Finally, the limitations and directions of future research are discussed.

5.1 Theoretical Contributions

Existing literature research on customer co-creation when it regards B2B start-ups as well as empirical research on customer co-creation is limited. This is why this research could be very valuable in validating if what is known about the customer co-creation process is also applicable in the context of customer co-creation for B2B start-ups. Additionally, other interesting and useful aspects of this collaboration method that were not identified in existing co-design research came forward from the results of this thesis.

To start, the partner selection criteria stood out. D'Andrea et al. (2019) stated that companies often lack explicit goals and partner selection criteria at the start of the project. This research showed that almost all involved start-ups identified the qualities of the customer co-creation partner that are needed to successfully collaborate and that it was important for the start-ups to find a partner that had qualities that were complementary to the expertise and knowledge of the start-up. This contradicts the statements from D'Andrea et al. (2019). Also, research from Jouny-Rivier, Reynoso, and Edvardsson (2017) mentioned that existing research lacks details on why organizations decide to collaborate with their customers. This paper contributes to increasing the insight into these details in the context of B2B start-ups. The most important considerations that were mentioned by interviewees to start a collaboration with their business customer are the relevant network, the domain and end-user knowledge, and the track record of the customer, as well as the validation that the partnerships brings to the market. When looking at the literature on the broader term of open innovation, research from Guertler and Sick (2021) confirms that defining selection criteria for an open innovation partner is challenging, especially for inexperienced companies. In this broader concept of open innovation Aloini et al. (2016) identified a list of all selection criteria for potential partners. The selection criteria from this list can be interpreted to address the domain knowledge and track record of the partner. All other criteria that were identified from the qualitative data from this research were not found while revisiting existing literature.

Next to that, it is seen that achieving mutual trust is one of the cornerstones of a successful NPD collaboration. This was already hinted towards in existing literature on customer co-creation. Franklin and Marshall (2019) already identified mutual trust as the foundation for the co-creation collaboration. However, existing research did not address this concept in the context of B2B start-ups that are collaborating with business customer. This research showed that achieving mutual trust is also very important for B2B start-ups that closely involve a customer co-creation partner while innovating. Most interviewees agreed that building this mutual trust results in a more informal relationship which positively affects the commitment of the business customer in the collaboration, increases the openness and willingness to share information, and lowers the barrier to contact one another. This fits with the statement of Grafmüller (2020) that partners, when the level of mutual trust is limited, might not disclose all information because of the fear of revealing their own customers and ideas. In some of the cases from this research, a high level of mutual trust also had the result that the partners saw less need

to make extensive formal contractual agreements at the start of the project, which saved considerable time and money. Attention to building this mutual trust was in most of the cases from this research spent throughout the whole collaboration by being open about, and giving insight into, the collaboration process. This was most intensively done during the 'mutual alignment' phase by painting a realistic perspective on the outcome of the project and by discussing the participants' shared goal and mission for the collaboration. This follows the recommendations made in co-creation literature for established companies (Grafmüller, 2020; Jouny-Rivier, Reynoso and Edvardsson, 2017; Laage-Hellman, Lind and Perna, 2014). It is interesting to see from the findings of this paper that more time was spent on the activities to achieve mutual trust when the entrepreneur had previous experience in business and customer co-creation activities than with start-ups in which the entrepreneur facilitated such a collaboration for the first time.

It was also noticed that achieving mutual trust was taken into account during the communication between the representatives of the start-up and the customer co-creation partner. Since most of the collaborations (partly) took place during the COVID-19 pandemic, online meetings were very common. However, some of the start-ups insisted on having face-to-face meetings at the start of the project to build on their personal relationship and mutual trust with the co-creation partner. Additionally, having these face-to-face meetings was also preferred since it could decrease miscommunication and give a better in-depth understanding of the use context. Grafmüller (2020) also mentions the importance of a face-to-face meeting before starting the collaboration since this contributes greatly to increasing the understanding of the requirements for the innovation by both parties, especially when this offline meeting is held in the environment in which the innovation will be used. Also during the validation phase, most entrepreneurs wanted to do the feedback meetings offline. This was especially the case when the innovation required physical interaction from the end-user. It was argued by some interviewees that this results in a better understanding of the innovation by the customer co-creation partner and makes it easier to communicate and process feedback and translate this to adjustments to the concepts and prototypes. This is in line with what was earlier identified in existing co-creation research from Aarikka-Stenroos and Jaakkola (2012), which suggests that face-to-face meetings lower the information asymmetry between the partners, decrease the perceived complexity of the innovation by the partner, and supports faster understanding. The use of a stable point of contact during the collaborations also stood out. Most interviewees mentioned that they chose to assign a fixed point of contact for the customer co-creation partner since that could contribute to increasing the focus of the rest of the development team, help to build a stronger personal relationship with the customer, increase the consistency throughout the collaboration, and decrease the risk of miscommunication. This adds to existing literature, that already identified that a stable point of contact could positively influence the openness and willingness to share information by the partner (Wildenbos, Jaspers and Peute, 2019). In the cases in which the partners had an existing relationship before the start of the collaboration, no point of contact was assigned. Presumably, since it was not needed to build a personal relationship in these partnerships. To conclude the most interesting findings regarding the communication throughout the collaboration, the agreements on the involvement intensity of the business customer were surprising. It is seen that in most collaborations the agreements were based on input and not on output. At the start of the collaborations the partners discussed when and how much time they would spend on the NPD process but less on when specific deadlines of the different phases would be. This could be due to the uncertainty that the NPD process brings, which makes it hard to set deadlines at the start of the project.

This research also showed a clear influence of previous NPD experience of the facilitating entrepreneur on the approach of the collaboration. It was found in this research that entrepreneurs with previous experience spent more time on discussing a shared goal and mission and communicating realistic expectations on the outcome of the project. Next to this, it was seen that entrepreneurs with previous NPD experience mostly had a pre-defined structured approach for the co-creation trajectory while inexperienced entrepreneurs mentioned that it was a process of learning by doing. This contradicts the research from Frow et al. (2015) which mentioned that most managers from established companies say

that their firm lacks a structured approach for the identification and implementation of customer co-creation activities. However, the entrepreneurs that were interviewed in this thesis who did have a structured approach did mention that this approach is subject to changes due to the uncertain nature of the NPD process. The process of customer co-creation always requires flexibility and it is regularly needed to deviate from pre-defined timelines.

5.2 Practical Implications

Next to the theoretical contributions of this paper, the goal was to provide nascent entrepreneurs with an in-depth insight into the implementation of customer co-creation partnerships as a B2B start-up and provide them with elaborate examples and actionable knowledge on this topic. This paper provides a good overview of successful customer co-creation partnerships of B2B start-ups with practical information on how these collaborations were established and maintained. The obtained data was structured and categorized in a step-by-step customer co-creation process. For each phase, an analysis of how the interviewed managers handled the situation was provided in the results section, while the most important and surprising managerial implications will be revisited in this section. A visualization of the step-by-step process can be seen in *figure 4*. This research can act as a structured base on which the nascent entrepreneurs can build their co-creation collaborations between their business customers and B2B start-up.

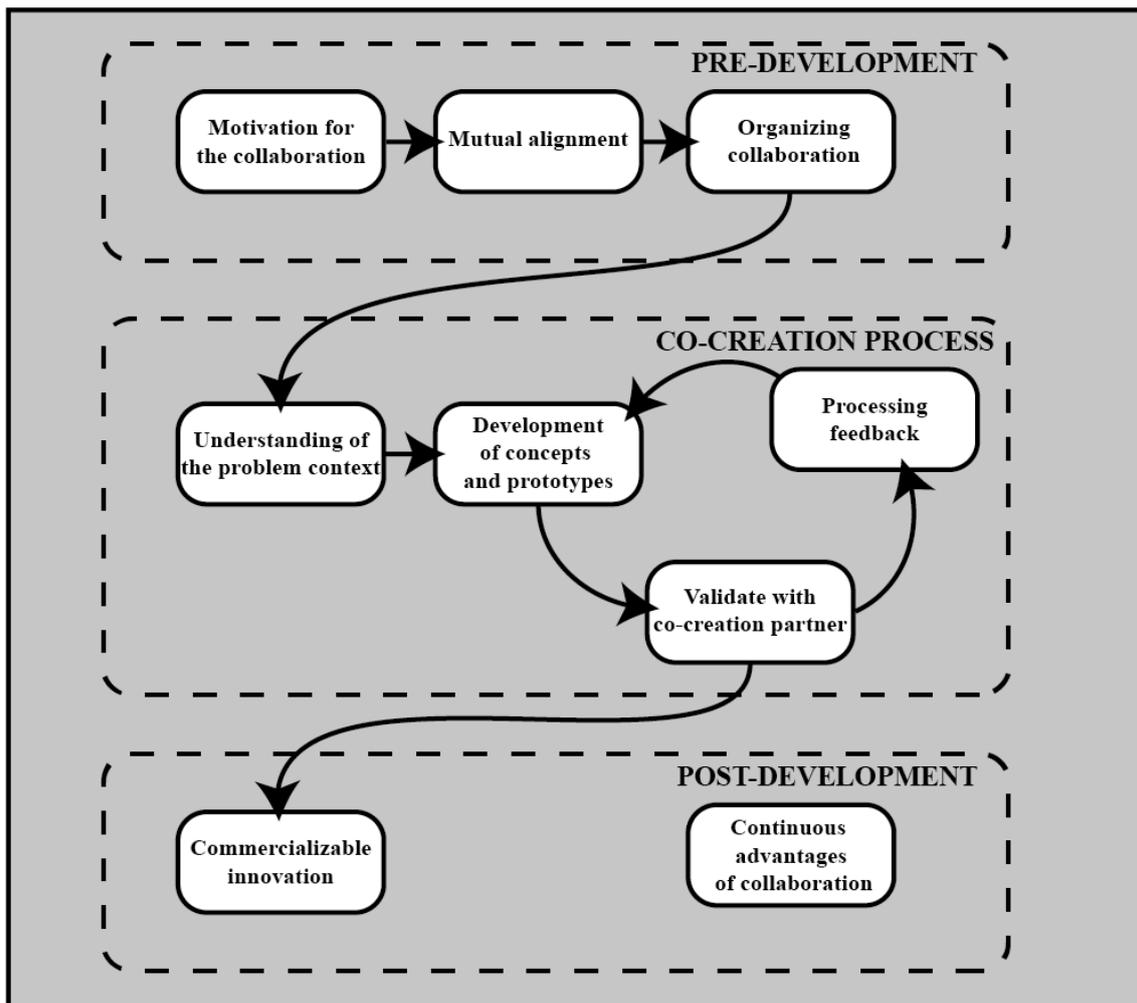


Figure 4 - Step-by-step customer co-creation collaboration

Arguably the most important aspect of facilitating a co-creation collaboration with a business customer is the building of mutual trust between the partners. This research showed that especially in the early stages, the pre-development stages, attention is spent on achieving mutual trust. A high level of mutual trust can lead to a more informal relationship which seems to improve the openness and willingness to share information by both partners and lower the barrier to contact each other. This open communication can improve the shared understanding and prevent information asymmetry during the NPD process. It can also help to decrease the amount of time-consuming and costly formal contracts since the partners operate based on this mutual trust. This mutual trust can be achieved by the entrepreneur by building a personal relationship with the business customer, creating mutual alignment, and being open about, and giving insight into, the collaboration process throughout the whole collaboration. This is especially important when painting a realistic perspective on the outcome of the project and by discussing the participants' shared goal and mission for the collaboration in the 'mutual alignment' phase.

Another important takeaway from this research for nascent entrepreneurs is that previous experience in NPD activities by the facilitator of the collaboration shows to affect the implementation of the co-creation process. Facilitators with previous NPD experience appear to spend more time on building mutual trust through discussing a shared goal and mission for the collaboration and communicating realistic expectations on the outcome of the project. Additionally, a more structured approach for the whole partnership is seen amongst experienced facilitators. These differences seem to positively contribute to facilitating a successful co-creation collaboration. Nascent entrepreneurs should therefore question whether they are ready to facilitate their own co-creation partnership with a business customer. If the entrepreneur is new to this area it would be wise to either delve into available theoretical knowledge and practical guidelines, such as this research, before facilitating a collaboration with a client firm, or to hire an external experienced facilitator to support or lead the B2B customer co-creation process.

This research stresses the importance of selecting the right customer co-creation partner. The entrepreneur should search for a co-creation partner with innovator or lead user characteristics. This business customer should be open to new ideas, risk-taking, and imaginative and should preferably experience the need or problem ahead of the market. It is also beneficial for the collaboration if the client firm has a relevant network, high domain and end-user knowledge, and a good track record. Collaborating with a qualified partner does not only contribute to a good outcome of the partnership but also improves the credibility of the innovation for the outside world. The motivation of the business customer is also something to consider. This research showed that the motivation of the partners was mostly based on the fact that they experienced an unmet need, or had an intrinsic interest in the innovation. Business customers with these drivers of motivation also seem to be the most valuable partners for a start-up. Their commitment to the collaboration and their interest in the future application of the innovation are high, and they rarely ask for financial compensation for their efforts.

Another key finding from this research is that the organization with the most knowledge of the experienced need, the requirements, and the abilities of the end-user should be leading in important design decisions. In most situations, this organization will be the customer co-creation partner, who is often also the end-user. This is especially important for the UX/UI design of the innovation since the end-user must be able and willing to interact with the final innovation. There are some nuances in place, since sometimes the customer co-creation partner can suggest characteristics or designs that are difficult or even impossible to turn into a reality. So the entrepreneur should try and find the right balance between fulfilling the wishes of the end-user while at the same time trusting their own knowledge and expertise in product development.

The final implication from this paper that deserves to be highlighted is the valuable additional benefits of customer co-creation partnerships, next to the development of the innovation itself. The most important one that entrepreneurs should take advantage of is the validation that a customer co-creation

collaboration can bring to the market for the developed innovation and also the start-up as a whole. Through the activities of the start-up with the client firm, most competitors of the business customer will keep an eye on the outcomes of the collaboration. If these are positive, this can lead to also acquiring these competitors as customers for the start-up. This can also increase the awareness and knowledge about the innovation in the market which can make it easier to acquire potential customers who experience the same unmet need. Next to this, it is also a valuable validation for the start-up as a whole. Start-ups that have little to no operating history and without connections to established companies are often being ignored or not taken seriously by large corporations. A successful co-creation collaboration with a client firm can be used by the entrepreneur to convince other stakeholders of the abilities and professionalism of the start-up. Additionally, the network and brand of the business customer can also be used as a marketing instrument by the collaborators to create exposure and awareness for the developed innovation to a broader audience than only the direct competitors of the co-creation partner.

5.3 Limitations and Future Research

5.3.1 Limitations

Various limitations apply to this research and should be considered when reading this paper.

First of all, for some of the cases that were examined for this thesis the start date of the partnership between the B2B start-up and their customer co-creation partner was a couple of years ago. While the important aspects of facilitating the collaboration are assumed to be known by the interviewee, this could mean that the interviewee forgot certain details of the NPD process or remembered them slightly differently. By only including partnerships that started after 01-01-2010 the potential effect of this limitation was reduced.

Second, to increase the generalizability of this research the selected cases differed in market segments, size of the start-up and the co-creation partners. However, the geographical diversity within this research is very limited since a majority of the start-ups that participated in the reviewed partnerships are based in Eindhoven, The Netherlands. Only one organization that participated in the reviewed collaborations is situated outside of Europe. This makes that differences in culture and social differences are not considered in this research and therefore could make this research less generalizable to continents other than Europe.

Third, another limitation could be that some of the cases in this thesis were still in the early stages of the NPD process. At first, this seemed applicable because it increased the difference in experience that the start-ups had in the process of co-creation which in turn could improve the generalizability of this research. However, this did have the result that for the cases that covered unfinished NPD processes not all stages of the trajectory were walked through, and therefore not all hoped for data could be collected for these cases.

Fourth, this research was performed by a single researcher. This could potentially lead to single-person bias. The influence of this bias is minimized by staying close to the objectiveness of the obtained qualitative data and outside sources. Furthermore, the transparency of the process of this research in the methodology and appendix and the close contact with supervisors that ensure that the research is performed in a scientifically reliable way add to the overall reliability of this research.

Finally, this research is largely based on the cases that consist of semi-structured interviews with the managers and/or founders of the start-ups involved in the customer co-creation partnerships. Most of the cases from this research were solely reviewed from the perspective of the start-up and not the

perspective of all involved partners. This means that no complete triangulation was achieved during this thesis. It could be possible that the entrepreneurs tend to present their start-ups more positively than it was in reality. This limitation was partially mitigated by addressing additional sources that are publicly available to confirm the successfulness of the collaborations, such as social media channels of the involved organizations and published articles about the collaboration.

5.3.1 Future research

For future research that builds on this thesis, it might be interesting to investigate the effectiveness of the step-by-step process that was constructed in this paper and can be seen in *figure 4* in combination with the actionable knowledge that is presented to the readers of this paper. The timeframe of this thesis did not allow this, but to confirm the findings of this research it would be interesting to see if the success rate of new products by B2B start-ups increases when the nascent entrepreneur has a structured process and actionable knowledge to fall back on.

Additionally, a comparable investigation focusing on the point of view of the customer co-creation partner could add value to this research. One customer co-creation partner was interviewed for the purpose of this research, but to get an in-depth understanding of how business customers experience this type of NPD process and to achieve triangulation more elaborate research on this perspective is required.

Another interesting direction for future research is to go more in-depth on the adoption behavior of co-created B2B innovations. Findings from this research imply that the validation and exposure that an innovation receives as a result of the collaboration with a business customer can positively influence the awareness and interest for the innovation amongst competitors of the client firm. However, it will be interesting to get more detailed information about what influence such a head start can have on, for example, the adoption rate, pricing strategy, and life cycle of the innovation.

Finally, future researchers could contribute to existing research by addressing the role of previous NPD experience of entrepreneurs in more detail. This paper shows that previous NPD experience can change the approach and focus the entrepreneur has on the co-creation process. However, these findings are still limited and superficial. An in-depth study on the success of co-created B2B innovations set against the experience of the facilitating entrepreneur, and the moderating effect of a supporting external experienced facilitator, would add value to the findings from this thesis.

6. Conclusion

The objective of this thesis was to address the identified gap, develop a better understanding of how B2B start-ups set up and manage their customer co-creation collaborations and to provide nascent entrepreneurs with actionable knowledge on how they could facilitate their own customer co-creation partnership. Through both the literature review and the multiple-case study this paper wanted to answer the following research question:

How can nascent entrepreneurs facilitate a successful customer co-creation collaboration within the NPD activities of their B2B start-up?

By having done this, the paper provided its readers with an understandable and helpful overview of the processes and effects of customer co-creation as a new product development method when used in a B2B start-up and presented elaborate examples and practical information on how nascent entrepreneurs can implement this approach in their B2B start-up. From these findings, a visualization of the step-by-step process which could be identified from the researched customer co-creation collaborations was constructed. The findings from this research, the actionable knowledge, and the step-by-step process can act as a structured base on which nascent entrepreneurs can build the implementation of a co-creation partnership with their business customers.

7. References

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8. Appendix

This appendix is excluded in the public version of the paper to secure the confidentiality of this thesis.

8.1 Basic information on start-ups connected to the cases

This section contains basic information on the start-ups that facilitated the customer co-creation collaborations in the different cases.

8.2 Introduction to the cases

This section contains an elaborate description of each case and the start-up and client firm connected to the case.

8.3 Interview protocol

This section contains the constructed interview protocol that was used for the semi-structured interviews.

8.4 Example quotes for each first order concept

This section contains an overview of all first-order concepts and gives an example quote from the qualitative data for each concept.