Master Thesis

Matching the Business Model with the Unique Customer Journey –

A Case Study of a High-Tech Dutch EMS Provider

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Preface

Before I got in contact with Global Electronics BV (GE), I noticed via their social media site that I had worked together with one of their most valuable customers, a company called Athom. In a former student project group, I had to run a Google Adverts champagne for their still not finalized product. This innovative, high-tech startup, specialized in home automation got publically funded to launch a series production with the significant help of GE. As I got to know in the first meeting with the manager of GE, they guided them during the whole design process, implementation, and production till the shipment to the MediaMarkt, which directly gave me a good overview of what various services GE is capable of.

The initial graduation assignment dealt with analyzing the size and trends within the German market to develop a targeted online strategy for this currently underrepresented market. Through my background in business administration with a particular interest in digital marketing, the assignment sounded particularly interesting for me. Its combination of required knowledge about customer segmentation, online marketing, business development, expert knowledge in the high-tech industry and the related processes created a multi-layered, challenging assignment. Together with their offer of an attractive internship program, adapted to my needs, finally persuaded me to start working with them.

When I started at the company, everything turned out to be different. Because GE also wanted to develop their online marketing strategy, including an entirely new website, the focus shifted away from the German market. Instead, GE hired an experienced business developer to target new customers and to further grow within their specialized market mainly focusing on the Dutch market. With the help Wirelab and NewMedia, two companies specialized online marketing and website development, the new design and structure of the site was set up and implemented. The launch of the website was perfectly timed with the visit of the Electronics Application fair in Utrecht, where could present new house style including a new stand, logo, and colors to the competitors, suppliers, and customers. Coming back to the website, GE thought about how to differentiate in the competitive market, and so they decided to integrate useful online tools to increase the customer experience which is new in a B2B environment. As the primary goal of the new site is generate more awareness and provide information for the potential new clients. I came to the idea to dive further into the concept of business modeling and customer journeys, which always starts with creating awareness.

First of all, I want to thank Ton Spil my university supervisor, who guided me during the whole development of my thesis and every time I needed his advice he had a positive remark and attitude towards my work and thoughts.

Further, I want to thank my company supervisor Seppe Meinders, who provided me with the possibilities to learn how digitalization and business development can look like in these days. I also want to thank Jeroen Schuiling who made contact with the customers I interviewed and Meino Toering, who set up the initial assignment and gave me the possibility to start working at GE. Last but not least, I would like to mention my family which supported me during my whole study.

Enjoy reading my thesis

Niklas Weber

Abstract

Purpose

The goal of this research was to identify the new B2B customer journey of specific customer segments in the Dutch market to match this communicated value proposition along the journey with a sustainable business model. The focus is put on the medical segment and a tailored marketing sales mix, including the preferred channel and relationships structure, taking the recent the trends of customization and digitalization of services into account.

Methodology

To assess the current state a critical literature review was conducted. Determination of the market segment, size and development were based on a web research and strategic aspects of the business model and the related concepts were derived by using semi-structured interviews with employees but also customers belonging to the identified medical segment.

Findings

The findings reveal that in today's B2B landscape a unique value proposition is increasingly more important. Inside-out defined services lack relevance for the specific customer and co-creation in the business relationship help the company to develop its own portfolio continuously. The business model is this context can be seen as a framework for the unique customer journey that needs to be managed efficiently at any touchpoint. To maximize the value for the customer and the experience, digitalization impacts the nature of the exchange of data, knowledge, and services needs to be integrated wisely.

Theoretical implication

From an academic perspective, the customer journeys and the mapping of those did not get the attention in a B2B context. The synergies with the Business Model Canvas should be used to develop new business models which set the customer experience more central during the journey. The rise of customer centric strategies and the right mixture of interaction to deliver the value proposition need to be reflected in new models. Further, they should also lay focus on the co-creation and establishment of networks as they play a major role in times of digitalization and globalization, especially for SMEs to stay competitive.

Practical implication

The resulting overview of relevant business activities and touchpoints of customer journey related to the delivering of the value proposition should help GE to formulate their targeted marketing strategy for a chosen segment and to redefine their online/offline channel strategy. By the in-depth analysis of one specific segment insights should be derived on how to target this segment. Marketers are encouraged by the results to look for which aspects of the customer journey are fixed or which ones may be applied for other segments as well.

Originality/value

This study combines the two practical concepts of business modeling and customer journey to create and communicate a unique value proposition, by facilitating customer experience and leading to a sustainable competitive advantage with customized business model blocks.

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List of Abbreviations

GE   =   General Electronics

SME   =   Small and Medium Sized Enterprises

EMS   =   Electronic Manufacturing Services

PCB   =   Printed Card Boards

OEM   =   Original Equipment Manufacturer

SMD   =   Surface-Mounted Device

BMC   =   Business Model Canvas

IT   =   Information Technologies

B2B   =   Business-to-Business

B2C   =   Business-to-Consumer

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1. Introduction

In today's business environment disruptive forces continually challenge companies to adapt their strategies and operations. Companies need to be aware of the rapid technology development, changing customer behavior and increased competition enforced by globalization and digitalization (Chareonwongsak, 2002).

On the one hand, globalization has made a significant impact on businesses, because transnational communication, free trade, and cultural exchange have created a worldwide market. Nowadays trade barriers are reduced, and integration of networks is enhanced, so businesses have to deal with the more dynamic environment (Kraemer, Gibbs, & Dedrick, 2005). This development also empowered consumers, as they gained access to choose products from different countries and transparency, degree of visibility and accessibility, of information becomes omnipresent (Collins, 2015; Leidner, 2010). The resulting higher level of competition and uncertainty can create a gap between business strategy and processes, which companies need to be aware of and preferable manage proactively (Al-Debei, El-Haddadeh, & Avison, 2008). On the other hand, digitalization also changes the business characteristics, customer's behavior and influences how the business creates value for their customer (Biggiero, 2006; Lusch, Vargo, & Tanniru, 2010). Companies need to be aware of the rapid pace of product and service innovations, which lead to shorter product life cycle (Ebert, 2006).

These two "megatrends" result in the rise of new business models, as leading companies more and more try to cope with increased global competition by "putting customer-centricity and experience at the heart of their strategy" (Maechler, Poenaru, Rüdt von Collenberg, & Schulze, 2017). The complex nature of this new business environment forces companies to constantly scrutinize their current products and services, as "the emergence of digital technologies enables interconnected digital ecosystems that comprise new actors, structures, and rules, eventually resulting in digital business models", which may challenge their existing model (El Sawy & Pereira, 2013). Arising from that, unique value propositions are required to stay competitive within this new market environment (Setia, Venkatesh, & Joglekar, 2013). Today organizations must focus on delivering the highest value to customers through better communication, faster delivery, and personalized products and services (Chen & Popovich, 2003). Online and cross-channel customer experiences are constantly getting more attention as the customers often use more than one channel during their contact with the supplier, wherefrom the digital channels are growing the fastest (Forrester Research, 2015a). Today this development is not only visible for the B2C relationships. It can be tracked that expectations routed in the B2C area are slowly migrating to B2B markets as well (Maechler, Sahni, & Oostrum, 2016). Therefore the growing importance of customer experience becomes a critical challenge and digitization further influencing the expectations of the customer. With new these rising expectations, they start to require specific standards for fast customer service, real-time responsiveness, and easy-to-use applications.

As a result of this automated data exchange is becoming dominant and orders, invoices or product descriptions are transmitted online via a predefined format and processed further, to facilitate the electronic data exchange between the procurement systems. The digital B2B market has enormous potential, as business customers are increasingly transferring their private shopping habits and expectations to their business activities. This change in behavior increases the demand for standardized goods, buying experience and the usability of websites (Claycomb, Iyer, & Germain, 2005; Lembke,

2013). With the customer experience becoming more and more relevant, traditional success factors like the accurate market segmentation, offering superior value with products and services, or being the lowest-cost producer are threatened by the ongoing trends which create a more competitive B2B landscape (Maechler et al., 2017). As Maechler et al. (2017) further outlined, due to this change "many players have invested in functional excellence [and the near future competition will be based on] smart combining of digital and non-digital transformation to improve customer experience". Aside from the channels, the growing customization and complexity of the B2B buying process also require the ability to scale data and analytics, which has fundamentally changed the nature of customer relationships (J. White, 2017).

When talking about the new way of customer experience tailor-made customer journeys are required to track every touch point of the customer with the brand, service or product. Therefore new organizational structures, processes, and tools to proactively lead digital customers from awareness and consideration to purchase are required, in order to maintain a source of competitive advantage (Edelman & Singer, 2015).The active customer relationship management becomes crucial as the increased competition does not provide any space for businesses with unspecified business value. Business survival, development, and growth depend on the reshaping the value proposition delivered via products and services, information and customer experience (Berman & Bell, 2011). Furthermore, the growing digital interaction with the customer enables the organizations to rapidly sense and respond to changing customer needs (Füller, Mühlbacher, Matzler, & Jawecki, 2009). The increased number of touchpoint with the consumer provides more opportunities to deliver personalized services and interactions at every stage of the customer journey, which is more and more required by B2B customers (Forrester Research, 2015b).

Further trends in the B2B environment show that information of third-party sources, feedback from a business partner and social channels gained a significant share in the consumer's decision making process. Businesses need to handle this new customer journey parts and manage actively various information sources that the customers now use ("Global Survey: B2B is the New B2C," 2013), if the right preparation of the information in different content types is missing they easily lose the prospective customers ("B2B Content Marketing ", 2015). Provided content must be informative, high-quality and fit with the solution the buyer needs, as the information behavior of B2B buyers differs according to the phase of the procurement process. "Content marketing" is the strategic marketing approach for this. The goal is to generate leads, brand awareness, engagement and sales from a defined target segments by "creating and distributing valuable, relevant and consistent content" (Content Marketing Institute, 2014). A target segment is to be maintained and developed using the right combination of information and channels, so they become loyal or even brand advocates, who actively promote the company (Järvinen & Taiminen, 2016).

In times of this dynamic environment business models, value proposition and their customer journeys are under constant external pressure to change. Until now in literature, the customer journey concept is well-developed for B2C markets, but in B2B markets the importance of tailored customer journeys and differences between customers are not covered completely. Complexity is expected to be much higher during B2B customer journey due to the higher level of involvement, deeper relationships and extensive customization (Maechler et al., 2017). In this context, Norton and Pine (2013) frame the relevance of the

customer journey concept as followed: "Mapping the relationship between the customer journey and company strategy provides a coherent structure for the business model". To further investigate how this can be done in practice, this research combines the two perspectives of the customer and supplier by trying to match the business model of a high-tech B2B company with the customer journey of a specific segment. The results reveal information about how the company can create a value proposition for a particular customer segment during the whole customer journey and gives advice how the business model needs to be adapted to cope with the different needs at each stage of the journey.

1.1. Research Question

This research aims to identify how the business model interacts with the customer journey and how both need to be designed to maximize the value for a specific customer segment. What leads us to the following research question:

"How should a high-tech B2B organization create and communicate a unique value proposition for its targeted customer segment to match the business model with the customer journey?"

1.2. Subquestions

Understanding the Business Model & Environment

- What are the needs and which capabilities and services are valued most by a particular segment?
- Which sales and marketing channels are suitable to acquire and maintain customers?
- Which form of the customer relationship is preferable to ensure successful customer retention?
- Is there any value network in place and how does the creation of it benefit the value proposition (Al-Debei & Avison, 2010)?
- How can the missing part of competitions be included in the assessment of the Business Model Canvas of Global Electronics (Coes, 2014)?

Understanding the Customers Journey

- What are the main obstacles of the sales funnel/customer journey in a digital and global B2B environment and which channels influence the customers?
- What does the full customer journey to conversion look like for business?
- At which stage of the customer journey the customer prefers a human interaction, digital service or entirely digital automated self-service?
- What touchpoint do they come in contact with to get information about the business and what format does the customer prefer to consume content?

1.3. The Case of Global Electronics

Global Electronics BV (GE) is a Dutch small/medium-sized enterprise (SME) and electronics manufacturing services (EMS) provider, founded in 1993 and located in Haaksbergen. The company supplies printed circuit boards (PCB) to original equipment manufacturers (OEM) mostly in the Netherlands and Belgium, but also other European countries. GE's production is multi-divisional as they

have two surface-mounted device (SMD) production lines, testing facilities, extensive hand assembly, an assembly line for end products called "box build", as well as a sales and administrative office. Overall, they employ a highly trained workforce of 30 employees, whereby two-thirds are directly involved in the production processes. Currently, the company develops customer specific solution systems for the medical, security, defense, automation, solar energy and other industrial segments. High-end startups further represent an additional focus area of GE, as they have the capabilities to guide them during their development phases, mitigate the risks with small series and box build the complete product in-house. Production volumes range up to about 100,000 units per order, which is typically low to medium level production so no mass production, which more and more manufactured in Asian countries.

In the scope of this research, GE would like to redefine its marketing strategy and align their offers effectively to the demand of their targeted market segments. They are aware of the fact that a unique online strategy will broaden their ability to increase their customer base, which will fit their profile as a flexible provider of PCBs with a clear focus on quality, short lead times and flexibility in processes. Segmentation is required to choose the right marketing message, channel and customer relationship for the prospects within the targeted segments. As there is at the moment, no clear segmentation is the place. All possibilities have to be considered to align the customer's needs with the firm's capabilities. Similarities and synergies between markets can help to attract new market segments more efficient. The potential problems and missed opportunities that can arise when a company does not segment it offerings market are not invisible, especially when entering a new market. So this research aims to investigate the differences between segments and create an actionable overview for the company which can be used to reach the target segment with the right collaboration of channels and marketing mix. Based on that segmentation these findings should further facilitate how they as a Dutch company can successfully enter other geographic markets with similar segment needs. As from their viewpoint, the German market is currently underrepresented, and same Dutch segments may be comparable regarding marketing, awareness creation and reach, taking the also the cultural differences into consideration which may impact the segments characteristics.

1.4. Outline of this Thesis

To investigate the proposed research question by providing the relevant theoretical concepts and research methodology in order to gain the necessary insights, conclusions, and recommendation this study will be structured as followed. In chapter 2 a literature review provides a state of art analysis including the core aspects of business modeling and the customer journey. Chapter 3 outlines the used methodology within this research, including the research design, selection, sample, measurement and data collection. Chapter 4 incorporates the results for the case of Global Electronics and the targeted medical segment, reporting the findings from the web research about the chosen segment and the answers from the interviews with both employees and customers. In chapter 5 the discussion summarizes the conclusion drawn from this research in relation to the theoretical framework. By also listing the theoretical and practical implications, limitations, as well as recommendations for future research the scope and value of this contribution, is defined.

2. Theoretical Framework

In this chapter, the theoretical foundations for the constructs used in this thesis are outlined. Further, it explains how the literature review was conducted to identify relevant streams and gaps in the current literature.

The first section will outline the concept of business modeling and tools to the overall business strategy to be able to define the scope of operations. The specific blocks of the most known business modeling tool the Business Model Canvas (BMC), by Osterwalder and Pigneur (2010), relevant for this research will be discussed, to evaluate the companies form of value creation for the customer. This evaluation will be conducted while taking the limitations of the model into consideration. The focus will lie on the creation, communication, and adaptation of unique value for specific customer segments the company can offer during the journey the customer makes when getting in any contact to purchase a service or product. As a major new channel, the facilitating role of the online channel and the incorporated marketing strategy are discussed in alignment with the business strategy.

The second main section takes the customer-centric perspective on the interaction with a company and outlines the customer journey they make during their several contact points before and after the purchase. This theoretical framework mainly serves two aspects. First to understand and evaluate the business and second the perspective of the customer the company wants to serve. While from the customer perspective is required to know their typical behavior and preferences to target them perfectly. From the business perspective, an own reflection of the core capabilities is essential to identify what form of value it wants to create with its product or service.

2.1. Systematic Literature Review

To provide a reliable approach to answer the research question a critical assessment of the existing relevant literature is required, in order to frame the areas of interest, possible problems, actions, recommendations and further develop the knowledge base (Tranfield, Denyer, & Smart, 2003).

By partly applying the literature review method developed by Wolfswinkel, Furtmueller, and Wilderom (2013) an adequate sample of articles used for this paper was determined. The five-stage grounded theory method was used for reviewing the literature consisting of the stages: define the scope, search for relevant literature, select suitable articles, analyze the chosen literature and present the insight. In the first step, the used search keywords were defined: "business model", "business model development", "business model canvas", "customer journey", "sales funnel", "buying funnel", "B2B marketing", "value network", "customer expectations". The search was conducted by using the online search engines Web of Science and Scopus, but mainly Google Scholar was used since it offered a huge variety of filters and was the most convenient in ease of use.

These keywords need to be mentioned in the article titles or abstract, to make sure that business models and other concepts are explicit objects of the research. As an additional aspect of the first step the field of investigation needed to be specified, whereby management, innovation, and entrepreneurship, but also marketing oriented journals were included. Articles were sorted according to the number of citations while focusing on the articles published after 2005, to consider the mentioned mega trends. Therefore also several online sources were used to identify the recent development within the B2B

market area. Further articles were identified through cross-referenced searches and by recommendation of an expert in the field of business modeling, which summed to a suitable amount of relevant literature. The most significant findings and theoretical contributions were then summarized and analyzed to present them the next section.

2.2. Business Modeling in a B2B Environment

This thesis is about business modeling in a B2B environment with particular focus on the creation and offering of unique value for specific segments, aligned with the digital channel, related marketing activities as an essential part of the customer journey. Therefore an in-depth understanding of business modeling in general, its roles, purpose, streams and the theoretical background is required. Relevant articles will be discussed to derive a common knowledge of this concept.

Overall, in the last two decades, the term "business model" accounted a significant increase in the number of management articles referring to it. Going hand in hand with the popularization and widespread diffusion of the Internet, which fostered the development and innovation of business models, together with the mega trends of globalization and sustainability (Zott, Amit, & Massa, 2011). First of all, there is not the one original conceptualization or definition of business models, and overall consensus within the literature about the definition and structure is lacking (Morris, Schindehutte, & Allen, 2005; Zott et al., 2011). Nevertheless, one of the underlining principles of business models is a "conceptualization of the money earning logic of a firm" (Osterwalder, 2004), which builds a linkage between strategy, business organization and information/communication technology (ICT) exposed to several external markets and environmental factors. Aside from the strategic aspect of the business model, one can say that a business model can involve internal factors, e.g. product or service related, and external factors, like competition and technological change (see figure 1).
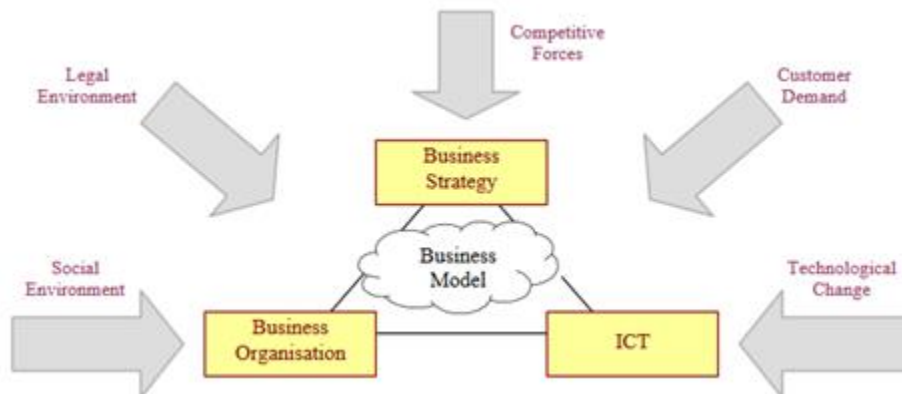
Figure 1: The Positioning of the Business Model in a Business Context (Osterwalder, 2004)

In practice, there is some misunderstanding in the role of the business model with regards to strategy, but as Casadesus-Masanell and Ricart (2010) state: "strategy and business model, though related, are different concepts: a business model is the direct result of strategy but is not, itself, strategy". Teece (2010) also sees the business model as more generic and as a step in designing a competitive strategy, while strategy focuses on the long-term direction and goals to maintain a sustainable competitive advantage. Similar to the model of Osterwalder (2004), Al-Debei and Avison (2010) illustrate the position

of the business model between the business strategy and processes. It tries to fill the gap which is often between those two due to new characteristics of doing business in the digital world, which is more complex, dynamic and has high levels of uncertainty and competition than the traditional world (see figure 2). The first intersection point represents the transitional stage, where strategy is translated "into more specific business architectural, co-operational, value propositional and financial arrangements needed to achieve the strategic goals and objectives of the business". While the second stage the business model serves as a "base system from which the detailed and operational business process model along with its information systems should be derived" (Al-Debei & Avison, 2010).

Figure 2: Business Model Intersection Points (Al-Debei & Avison, 2010)

2.2.1. Definition of Business Models

Aside from its position in the business context and environment, Morris et al. (2005) defined three general categories of business model definitions based on their literature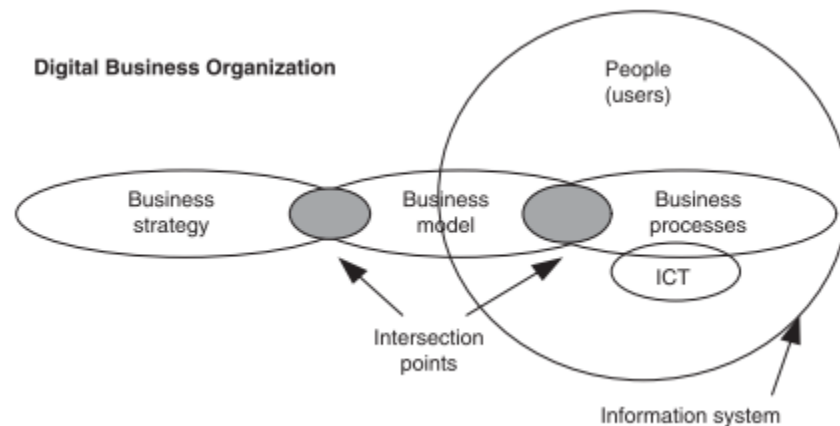 search. The first type is economic, focusing on the logic of profit generation and including revenue sources, pricing methodologies, and cost structures. Second, operational is elaborating architectural configuration, internal processes, and design of infrastructure. Third, at the strategic level setting an overall direction for the firm's market positioning, relationships and growth opportunities are essential elements. Further, the creation of a network, competitive advantage and sustainability are of concern and have to be in line with the vision of the business (Morris et al., 2005).

The three type classification of the business model concept areas was also found by Wirtz (2011) in his overview of the business model literature streams (see Appendix 1 for the full model). The first stream, technology, gained much attention "during the internet boom when firms and analysts came to realize that existing ways of earning a profit were not suitable for capitalizing on new technologies: web-based products and services" (Boons & Lüdeke-Freund, 2013). This boom contributed a huge part to the creation of business model opportunities and organizing business activities, especially by creating a new channel for marketing and communication, but also enabling the access to information (Massa & Tucci, 2013; Timmers, 1998). The second organizational stream sees business models as a strategic management tool to improve the organizational efficiency, whereby the structure and architecture are in focus of the business model tool (Wirtz, 2011). The third stream is strategy-oriented and adds the essential elements of market competitions to the business model. Value creation for the customer takes

in a fundamental role in this approach. In this case, business model innovation can enforce a competitive advantage by delivering a unique value proposition or configuration of the business model blocks (Chesbrough, 2010; Massa & Tucci, 2013; Wirtz, 2011). Outperforming competitors from a strategic view is a clear "plan of which business model to adopt" (Casadesus-Masanell & Ricart, 2010) and "strategic interaction between rivals results in the competition based on business model modifications" (Wirtz, 2011).

Innovation is in this context a useful approach for sustaining competitive advantage (Boons & Lüdeke-Freund, 2013). As we speak of business model innovation, the term combines the two distinct activities of business model design and reconfiguration (Massa & Tucci, 2013). The design is the entrepreneurial activity of creating content, structure, and governance of the business to set up and sustain the value for the customer (Amit & Zott, 2001). In contrast, reconfiguration concern the adjustment of existing models, whereby not all modifications in design or reconfiguration will lead to business model innovation, as the uniqueness and novelty need to be visible to establish a unique value proposition (Massa & Tucci, 2013). Speaking of business model change, innovations such as digital technologies can have a significant influence on the business model. As outlined in the work of Cavalcante, Kesting, and Ulhøi (2011), the changes can take three ways it can be in the form of a business model extension which is described as "adding further activities to an existing business model without fundamentally altering the existing core logic". Second, revision which is a "profound redesign of the current business model and thus can be related to radical or disruptive change" (Hanelt, Piccinini, Gregory, Hildebrandt, & Kolbe, 2015) and lastly business model termination which is the elimination of business activities.

Turning back to the business model definition Wirtz (2011) comes to his definition of business models which focus on the main activities, value proposition, architecture and competitive advantage:

> "*A business model is a simplified and aggregated representation of the relevant activities of a company. It describes how marketable information, products and/or services are generated by means of a company's value-added component. In addition to the architecture of value creation, strategic as well as customer and market components are considered in order to realize the overriding objective of generating and preserving a competitive advantage*."

Teece (2010) followed the third strategy-oriented stream presented by Wirtz (2011) and put the customer value in focus. As Teece (2010) defines the purpose of business models and the central questions incorporated, "How a firm delivers value to customers and converts payment into profits?" Whereas, Zott and Amit (2009) in contrast more focus on inter-firm relationships as the define business models as "a system of interdependent activities that transcends the focal firm and spans its boundaries."

One of the most known definitions of business modeling is defined by Osterwalder and Pigneur (2010) as: "A business model describes the rationale of how an organization creates, delivers, and captures value" including the three prior mentioned dimensions. Based on his initial work Osterwalder, Pigneur, and Tucci (2005) where they defined the business model as a "conceptual tool containing a set of objects, concepts and their relationships with the objective to express the business logic of a specific firm". In contrast, Casadesus-Masanell and Ricart (2010) use a more simplistic and practical approach and describe the business model as two different sets of elements choices how the organization must

operate and consequences of those choices. They see the firm's business model as a reflection of its realized strategy. With business strategies becoming more and more customer-centric, due to the intensified business relationship and as a response to increased global competition, changes in the business model and its definition are inevitable (Maechler et al., 2017).

Concluding to say there is no consensus about the "perfect" definition of the business model, but the different origins of business model overlap in the point that all different architectural arrangements within the business context need to be aligned to achieve the strategic goals and objectives of the firm. New configurations of the business model and shift of priorities are expected, as the need for better customer experience arises, and the right mixture of interaction with the customer has to be determined.

2.2.2. Functions of Business Models & Value Network

Aside from the characterization of business models types and definitions a business model can have different practical functions. Mainly this simplification of business blocks can be used to translate the vision and strategy of a company into value propositions, customer relations and value networks (Osterwalder, 2004). Osterwalder (2004) further identified five categories of functions. First, the business model can work as a tool to help to understand and share the business logic of a firm. Second, this logic can be analyzed and used to improve, measuring compare business processes. Third, due to this analysis, the management of the business logic can be enhanced. Business models facilitate the design planning and increase the adaptability to changes in the business environment. Fourth, it can contribute to foster innovation in the future as a simulation of critical organizational blocks can be modeled and defined. Fifth, aligned with the e-business model archetype (Zott et al., 2011), business modeling could play an important role the legal domain as "companies in e-business seek to patent e-business processes and even entire aspects of their business model" (Osterwalder, 2004). Building on this functional and practical approach the business model can further be used to provide answers to several business-related factors (Morris et al., 2005):

Factor	Question
• Related to offering	*How do we create value?*
• Market	*Who do we create value for?*
• Internal capabilities	*What is our source of competence?*
• Competitive strategy	*How do we competitively position ourselves?*
• Economic	*How we make money?*
• Personal/ investor	*What are our time, scope, and size ambitions?*

All in all, two general roles of business models can be differentiated based on the multiple functions (Boons & Lüdeke-Freund, 2013; Wirtz, 2011). First, support the strategic marketing of innovative processes, products, and services (Teece, 2010). Second, business models can be innovated to create and sustain competitive advantage by changing the terms of competition (Boons & Lüdeke-Freund, 2013; Chesbrough, 2010). The business model is not purely there to visualize the business activities. Rather it can be used to measure certain characteristics of the model which later can be compared to the

competitors to reach a competitive advantage via an individual, unique business model. Comparability and competitiveness assessment of business is based on measures are like market share, channel complexity or the degree of networkedness (Osterwalder, 2004).

A variety of functions of the business model is also summarized by Chesbrough and Rosenbloom (2002). The authors argue that an identification of the market is then required to help to define the two important aspects of the value chain. First, the distribution of the offerings and the complementary assets needed to support the firm's position and second the architecture of the revenues including the cost structure and profit potential. When this is established a company also needs to consider suppliers consumers and third parties who add an extra value called when collaborating here called "value network". This network increases the supply of complementary goods on the supply side and can increase the network effects among consumers on the demand side. In the end, the business model takes in a mediating role between the technical and economic domains and helps to formulate a competitive strategy (Chesbrough & Rosenbloom, 2002). In general, a distinction can be made between firm-centered and network-centered business models (Dara, 2013).

The term value network was also mentioned by (Al-Debei & Avison, 2010) as one of their 4 Vs, the others being: value proposition, value finance, value architecture. According to Al-Debei and Avison (2010), the value network defines "a way in which an organization enables transactions through coordination and collaboration among parties and multiple companies", which is more focused on demand as this construct represents the cross-company or inter-organization perspective of the business model. This network includes different "organizational actors" also known as stakeholders that together with roles, relationships, channels, and governance constitute the concept of the value network (Al-Debei, Al-Lozi, & Fitzgerald, 2013) (see figure 3).

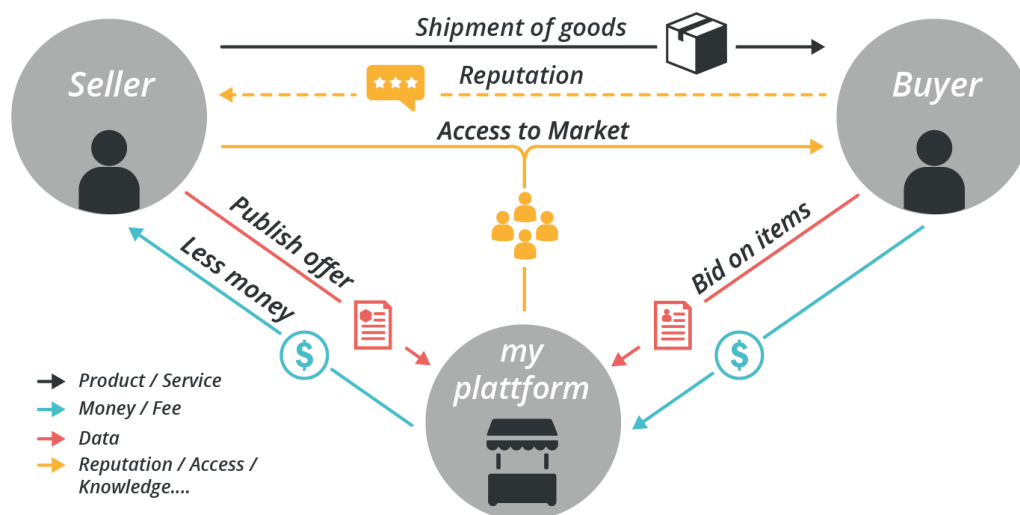**Figure 3: Relationships within a Customer Focused Value Network ("Value Network," 2017)**

In the context of a value network, Gummesson (2008) outline: "the creation of services nowadays is not only limited to the traditional supplier-customer relationship, rather a network of activities creates unique value, involving a host of stakeholder". Within the network, relationships and interactions with

multiple actors through the supplier's value chain are critical, as they can co-create value and help to deliver it to the customer. Overall the "supplier's value chain is broadened into a network, which in turn is linked to a customer value network" (Gummesson & Mele, 2010).

Particularly, with the rise of digital business models the creation of value networks also with consumers gained importance to cope with the dynamic and global environment as well as changing customer and market requirements. While before the value chain processes where somehow linear from the production input of the supplier till the finished product sold to the buyer, nowadays all types of value exchange (money, data, service, reputation) between the business and its stakeholders (Lusch et al., 2010). Lusch et al. (2010) summarize the main goals of the value network to co-produce service offerings, exchange service offerings and co-create value, while the supply chain only takes in a subpart of the network. Nevertheless, as Al-Debei and Avison (2010) outline the business model's consistency of value network actors still requires some further research. As the "success of an organization's BM depends to some extent on the relationships, it maintains with various players within the value system. However, the expected benefits are not easily achieved as actors might pursue different business logics, and chase different strategic goals with the collaboration. Exploring how actors belong to the same value network could reach a 'win-win' situations." Therefore the marketing and sales channel needs to be aligned to facilitate the right customer relationship, but further organizational implications remain unclear.

2.3. Business Model Canvas

In this thesis, the BMC is the central tool which is used to map the business model of the case company. The business model ontology which was developed by Osterwalder and Pigneur (2010) takes a firm-centered, broad view on the subject of business modeling. They developed a combination including the five aspects: "Value Creation Model, Value Offering Model, Value Capturing Model, Cooperation Model and Financial Model" (Krumeich, Burkhart, Werth, & Loos, 2012).

Osterwalder and Pigneur (2010) define nine building blocks which constitute a business model. Those buildings blocks were developed to create a business model tool, which covers the four main areas of business: customers, offer, infrastructure, and financial viability. As they further define it as: "like a blueprint for a strategy to be implemented through organizational structures, processes, and systems" (Osterwalder & Pigneur, 2010). This tool aims to create a common language to compare business models in practice regarding capturing, creating and delivering value, but also highlights the usability and applicability within a certain business context. Visualization makes the communicability much easier and standardizes the key building blocks. The harmony and specific combination between those blocks lead to a unique business model that ensures a sustainable competitive advantage (Osterwalder & Pigneur, 2010). The nine building blocks based on the mentioned four areas can be seen in figure 4. These building blocks serve as the basis for the preparation of the answers to some fundamental questions, concerning the implementation of the business model of a company and go over the core questions from Magretta (2002): who your customers are, what they value, and how you will make money in providing them that value?
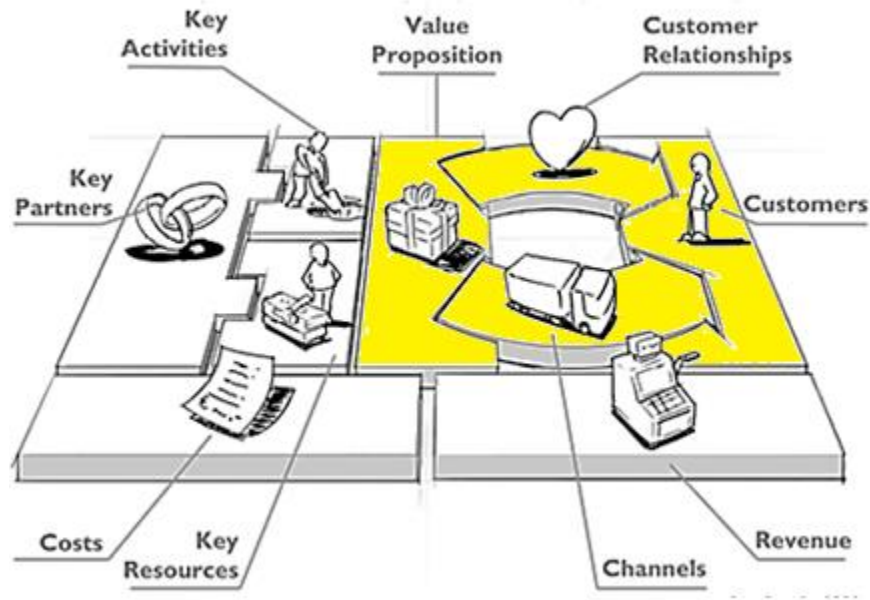
Figure 4: Business Model Canvas (Osterwalder & Pigneur, 2010)

In the next sections, the individual buildings block of the BMC by Osterwalder and Pigneur (2010) will be briefly explained. The focus of this study will lie on the business interaction with the customer segments and communication of the value proposition, including the right channel and customer relationship. This part of the interaction can be seen as the customer side of the business model and lay the foundation for the concept of customer journey.

2.3.1. Value Proposition

The value proposition is the central block in the BMC, as the overall goal is to serve needs of specific customer segments to sustain a long-term business success. Delivering value for the client is more fundamental to this approach instead of product design and features. In general, the value proposition is an "aggregation, or bundle, of benefits that a company offers customers" (Osterwalder & Pigneur, 2010). This value may be quantitative (e.g. price, speed of service) or qualitative (e.g. design, customer experience) and is not one set for a one-time purchase rather should be studied over its entire life cycle. This life cycle is divided into five stages: creation, purchase, use, renewal, and transfer (Osterwalder, 2004). First, value creation has been facilitated by the emerging ICT possibilities and integration of customers, which led to customization of product and inclusion in the value creation process by providing direct feedback (Osterwalder, 2004). In times of the digitalization and emergence of value networks, co-creation of value including both suppliers and customers can also lead to a unique offering mix (Lusch et al., 2010). Second, value purchase is associated with the creation of a customer buying experience during the purchase phase. Here aspects like traceability during the process can lead to a higher customer satisfaction resulting in value. Furthermore, automation can also be seen as a significant benefit as it increases the speed of actions and autonomy of the customer (Peppers & Rogers, 2016).

Third, value use is concerned with the consumption of the product or service. This value is maximized when the value proposition's attributes match the specific customer's needs. Fourth, value renewal can become interesting in some cases after or during its consumption, as the product could be expired, obsolete or dysfunctional over time and new features and updates are required for the current value proposition. Fifth, value transfer is valuable when to customer loses his interest in the product as Osterwalder (2004) states "sometimes value becomes a burden when it has to be disposed", so business can also create value at the end of a product lifecycle.

With regard to marketing, the customer value proposition is a "strategic tool facilitating communication of an organization's ability to share resources and offer a superior value package to targeted customers" (Payne, Frow, & Eggert, 2017). The mentioned concept of customer experience is also central to the value propositions as it concerns not on the value rather the personal interaction with the client to match their expectations with the perceived value (Gentile, Spiller, & Noci, 2007). All in all, the business will not survive unless it can adapt its offerings to provide a competitive value proposition to customers (Vargo & Lusch, 2004).

2.3.2. Customer Segments

Closely related to the value proposition is the customer segment, as the value proposition needs to be designed to fulfill the specific requirements of that segment the business wants to target. Customers are the essential part which ensures a business survival. They are defined as "different groups of people or organizations an organization aims to reach and serve" (Osterwalder & Pigneur, 2010). These groups here called segments need to be clear to tailor the product and service according to their common needs, typical behaviors, or other attributes. Segmentation can also take place via which distribution channel the customer is reached, which relationships are required, their profitability or their willingness to pay for a different aspect of the offer (Osterwalder & Pigneur, 2010). If customer segmentation is absent the business focus on a mass market, including a fully standardized value proposition, distribution channels, and customer relationships, which is no longer effective in today's industries. Therefore one of the main goals of segmentation is to identify and find profitable customer groups which could be targeted by differentiated marketing strategies. Whereas market segmentation in B2B markets in comparison to B2C markets is slightly different as the involvement of the customer, needs and buying characteristics differ. Customers have longer decision making cycles as more money is involved (Wedel & Kamakura, 2012).

Six standard segmentation schemes are commonly applied (Nguyen, 2016):

- Geographic base / reach
- Industry / sub-industry / industry served / customer served
- Product class/product usage
- Organization size
- Product delivery model/product or packaging format / special technology/process methodology
- Special use/needs

Once an overview of segments is established the quality, size and growth potential of this segment can be estimated to value to the overall attractiveness of that segment for the business. Based on the

identification of the ideal customer segment the business can improve their products offerings according to their needs, target the marketing message. Further, the resources can be focused on the more profitable business opportunities to create higher margins (Nguyen, 2016).

2.3.3. Channels

Distribution, sales, and communication channels are in place to deliver the value proportion, reach and connect with the targeted customer segments. This interaction with the client could be direct via a sales representative or indirect via any intermediary (Osterwalder & Pigneur, 2010). In the past development of ICT has increased the possibilities and variety of channel types how a business can organize a set of mechanisms or a network via it can reach the customer segments (Zott et al., 2011). Communication, channel strategy, and distribution must be designed to not only create customer awareness, rather help the customer to evaluate, purchase and deliver the product or service. Channels are further distinguished between owned channels and partner channels, which are outsourced (Osterwalder & Pigneur, 2010). Partner channels have lower margins; they can lead to broader diffusion and faster growth opportunities. In contrast, the higher margins of owned channels and particularly direct ones can be costly to create and operate (Osterwalder & Pigneur, 2010). Figure 5 provides the complete overview of channel possibilities and channel phases in the context of the BMC.

Figure 5: Channel Overview (Osterwalder & Pigneur, 2010)

As an emerging channel in the overall business model design, the online channel is important to create awareness. According Lembke (2013), who identified e-commerce trends in Germany, multi-channel activities are aimed at generating omnipresence of online offers, brands, and services on the Internet, a the multi-optional consumer demands also multi-sales channels. Therefore, companies today and in the future have to offer every customer the right sales channel, to increase customer loyalty and address new customer segments. Especially when adding social media as a new channel to the marketing mix. Armelini and Villanueva (2011) state "the Online word of mouth (e-WOM) has one major advantage over advertising: It is immediate and interactive, and that makes it easier to intervene." Businesses can use this channel easily which is free from any startup costs, but there are some strategic aspects which need to be specified. Targets need to be formulated to define the goal of the channel, (e.g. attract customers, gather feedback or inform the customer about recent developments). To see if the company succeeds in reaching the predetermined goals the activities need to be measured in any form of numerical data (Armelini & Villanueva, 2011).

Overall, a multi-channel strategy is fast becoming the norm for going to market in the business-to-business sector as customers demand more options to access products and services, but also providing firms with more opportunities to reach more customers (Rosenbloom, 2007). "Building unified and pro-active cross-channel services will deliver differentiated customer experiences that drive loyalty and repeat sales" (Deloitte, 2013). Therefore the digital marketing strategy needs to be closely aligned with the channel structure, value proposition, and the targeted customer segments.

2.3.4. Customer Relationship

Customer relationship links the value propositions and the customer segment together with the channel in use. These are the types of relationships a company establishes with specific customer segments to optimize the interaction and sell more product or services. Those relationships range from personal to automated (Osterwalder & Pigneur, 2010). Osterwalder and Pigneur (2010) distinguish between six different customer relationships:

Customer Relationship	Specification
• Personal assistance	human interaction with the customer
• Dedicated personal assistance	one customer representative for each individual client
• Self-service	no direct relationship with customers
• Automated services	mix of self-service and automated processes
• Communities	creation of e.g. online communities for exchange
• Co-creation	direct influence on the value proposition

This clear differentiation helps to support and structure the customer experience during the customer journey. Individual relationships enhance loyalty, and the acquisition of potential new customers is relying on the perception of existing customers. Motivations to develop customer relationships are new customer acquisition, retention and increasing sales with the current customers (Holland, 2014). Personal assistance represents a direct, intimate relationship with employees the specific customer segments. In contrast, self-service is an indirect relationship management approach where the customers have to deal with needs on their own. Again with the rise of ICT systems communities of customers can be used to create awareness of industry trends and to adapt the value proposition and the other blocks proactively. This active involvement of the customer in modifying the company's product or service is maximized when applying co-creation.

Morgan and Hunt (1994) developed a model called "The Key Mediating Variable of Relationship Marketing", which sees relationship commitment as the overall goal of customer relationship marketing. The key mediator is trust, but further important aspects are opportunistic behavior/ mutual benefit, communication/ customer service. Relationship commitment is further defined as the "exchange partner believing that an ongoing relationship with another is so important as to warrant maximum efforts at maintaining it" (Morgan & Hunt, 1994). All in all a successful customer relationship management can lead to higher revenues and lower operational costs. The effective and efficient managing of customer relationships can boost customer satisfaction retention rates and creates the basis for a long-lasting mutually beneficial relationship (Chen & Popovich, 2003).

2.4. Limitations of the Business Model Canvas

The BMC is a tool to model the most relevant business characteristics and activities in a simplified manner. It is more a framework instead of a grounded theory as the exact relationships between the specific blocks remain unclear. This simplification comes with several substantial limitations which will be outlined in this section.

First of all the value proposition does not include social value, which implies the lacking applicability for nonprofit organizations (Coes, 2014). A more important factor to be aware of, in a typical profit-seeking B2B environment, is that the BMC completely ignores external factors such as competition, imitation, and market. Risk cannot be assessed, and a competitive strategy cannot solely be based on the BMC, as it was already described in the positioning of the BMC within the business context (Al-Debei & Avison, 2010; Casadesus-Masanell & Ricart, 2010; Teece, 2010). Due to these limitations, the BMC does not provide any information about a growth strategy, but it can be easily compared with other companies' models.

In practice, a comparison with the value propositions of competitors has to be made to prevent a potential misalignment with the market. Further individual building blocks also need to be defined about competitors, because the choice of whom the business defines as the main competitor has a strong effect on the business model. When taking in the perspective of the customer, the value proposition is especially affected since the prospect customers will always compare the business value proposition to those of competitors (Kraaijenbrink, 2012).

The research of Coes (2014) further highlighted that in practice the building blocks channel and customer relationship overlap as well as key resources and activities. This overlap may lead to misunderstanding and confusion among the users. Additionally to say is that a time element is also missing, which is crucial when the business model wants to be translated into actions and later be implemented. Aside from the usage limitation the BMC does not foster creativity within the company, employees are forced to think in blocks, but this can be seen as the tradeoff of any simplification (See Appendix 2 for the complete overview of strength and limitations of the BMC by Coes (2014)).

An interesting contribution to the discussion about the usability of business models was also made by Shafer, Smith, and Linder (2005), the authors outlined: "many executives have a tendency to focus so much on the value creation part of the model that the value capture portion is ignored or at least downplayed. In these situations, organizations are unable to capture corresponding economic returns." This remark supports the view that the business model cannot solely be used to capture the operational planning but it can "provide a powerful way for executives to analyze and communicate their strategic choices" (Shafer et al., 2005).

As just described one of the aspects not included in the BMC are competition and external factors. These external aspects need to be discussed to determine the potential market environment, market developments and attractiveness of the segments in the country of interest. An assessment is required to understand the business model and the customer and not only to use an isolated view of the firm. The most known concept in the context of industry analysis is Porter's Five Forces model (1980), which is based on the recognition that a company's strategy must be oriented towards its market environment. The strength of the forces determines the intensity of the competition in the industry and thus its profitability and attractiveness. Profitability of the business is influenced, as the forces shape prices,

costs and required investments. Therefore companies should aim with business strategy be to find ways to weaken these competitive forces (Porter, 1980). The proposed model by Porter (1980) includes two forces resulting from vertical competition in the supply chain namely "bargaining power of suppliers" and "bargaining power of customers". The other three forces are on the horizontal level, "threat of substitute products or services", "threat of new entrants" and "rivalry among existing competitors". Figure 6 lists the most influencing factors for each force.
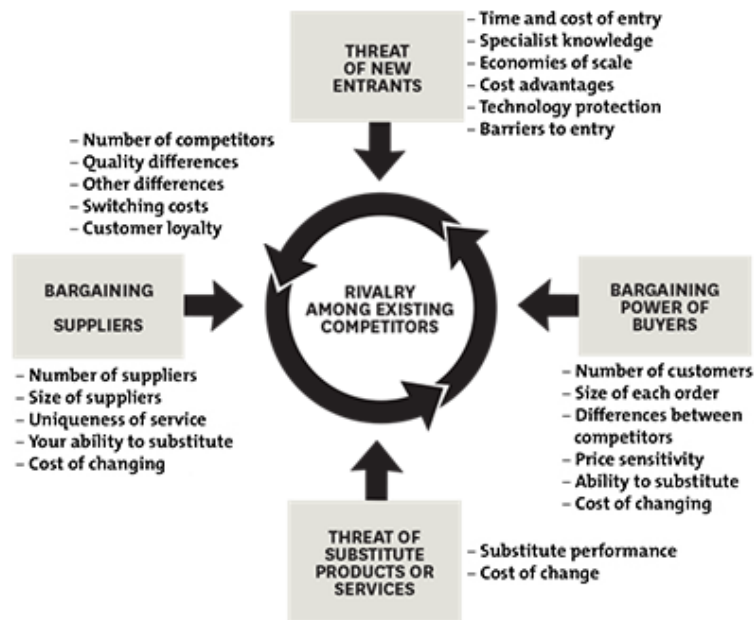
Figure 6: Five Forces Model (Manktelow et al., 2017; Porter, 2008)

The forces are a useful indicator to receive a better market and especially customer understanding. As the main goal of customer relationship management is to mapping is to maximize the lifetime value of customers by maximizing the customer's conversion, loyalty, retention, and profitability. These points reflect the different phases the customer passes through when making contact with the business (Al-Arafati, 2016). By referring to the value network again, the customer should aim to seek for collaboration instead of a typical hierarchical customer-supplier relationship, as the mutually beneficial effect of such a network can only be present if the customer and market strive for it. Power in this context is a major component which can enhance the relationship commitment. Further Zhao, Huo, Flynn, and Yeung (2008) concluded that power could improve customer integration while reducing transaction costs and opportunistic behaviors, which is essential for a value network. However, power also needs to be considered due to the shift in consumer decision making enforced by the more transparent information, globalization, and digitalization. As Court, Elzinga, Mulder, and Vetvik (2009) put it: "to view the change not as a loss of power over consumers but as an opportunity to be in the right place at the right time, giving them the information and support they need to make the right decisions".

In the scope of this study, the Five Forces Model (Porter, 1980) will be used to evaluate the market characteristics the case company is operating in to develop a competitive business model that provides a

unique value proposition for the customer segments. Power relationships with the customer and supplier are of particular interest to estimate the interest and willingness to form a value network or demand for customization.

2.5. The Buying Funnel, Tracking the Customer Journey in B2B Markets

The channel phases mentioned in the BMC are critical when it comes to evaluating the marketing and sales process and especially to identify at which point potential customer acquisition or retention may be hindered. This sequence of activities and events that lead customers toward a purchase and an ongoing relationship is called "funnel", which can be seen either from the customer's perspective or the seller's perspective (Kotler, Rackham, & Krishnaswamy, 2006). Accordingly, the metaphor describes all potential customers with whom business is aiming to initiate a relationship. If the visitor completely passes through the funnel, and in the end again out of the funnel, the potential customer becomes an actual customer. The task of the business is thus to accompany, influence and control the journey of possible customers through the funnel so that the total number of conversions is increased or maximized in the end (Mutschler, 2017). Similarities can be seen when comparing the funnel concept to the popular AIDA model (attention, interest, desire, action) and five-stage model of the buying process proposed by Kotler (2000) (problem recognition, information search, evaluation of alternatives, purchase decision, post purchase behavior). Those models are typical hierarchy-of-effects models that describe the different phases of the customer before and after making a buying decision (Ghirvu, 2013; Lancaster & Withey, 2006). When taking the perspective of business, this conversion process is often termed buying, marketing or sales funnel and varies depending on the nature of the business. These practical concepts miss a clear distinction from each other, while all consider the sequential steps a consumer takes to purchase a product or service (Haven, 2007; Jansen & Schuster, 2011; Kotler et al., 2006).

Addressing the specific stages of the funnel, "marketing is usually responsible for the first few steps—building customers' brand awareness and brand preference, creating a marketing plan, and generating leads for sales. Then sales executes the marketing plan and follows up on leads" (Kotler et al., 2006). Branding can easily influence the buyer at every stage of the buying process, whereas marketing channels such as email are more useful for targeting prospects in the later stages, whereas display advertisement could influence the prospect from the start on (Leake, Vaccarello, & Ginty, 2012).

The conversion process usually starts with creating brand awareness, then moves to interest/ engagement and over perception/ consideration to the final decision to buy (Leake et al., 2012). When the purchase is completed after-sales support enables the creation of loyalty. It results from the level of commitment, trust, and satisfaction the customers perceives when doing business with his supplier (Rauyruen & Miller, 2007). Typically loyalty is defined by the "actual frequency and volume (cumulative sales) of the customer's purchases" (Chang, Easley, & Shaw, 2003) during a given period. Based on loyalty, a positive word of mouth or referral in the form of recommendation of a pleasant user experience could be spread. In this context, website characteristics have been identified by Chung and Shin (2015) to have a significant impact on all of the relationship quality variables namely trust, satisfaction, and commitment and thus were indirectly related to e-trust, e-commitment, and word of mouth. However, loyalty is not the only about creating a certain number of customers over time, but it is

also about "nurturing the relationship with business customers to encourage their future purchase and level of advocacy" (Rauyruen & Miller, 2007). Loyalty programs can be in place to actively maintain a customer-supplier relationship. They "represent firm marketing initiatives to recognize and reward valuable customers, […] help to mitigate invasion-of-privacy concerns"(Lacey & Morgan, 2008). If loyalty is established the customer can move to the final stage of the funnel or journey which is called "advocacy", here the consumer is creating marketing related content for his supplier free of charge via his channels or network. More than that customer advocacy is defined as, "not just repeat business, word-of-mouth testimonials and referrals but a comprehensive willingness on the customers' part to help the business grow" (Lacey & Morgan, 2008). Lacey and Morgan (2008) found strong evidence that committed customers have a higher willingness to function as voluntary marketing advocate. Examples could be reviews, recommendations, word of mouth, social sharing, referrals, and testimonials within their community. Brand advocates are seen "contributors", as customers who promote a brand through social media tools. Advocacy is increasingly more important in B2B marketing because today's customers create and prefer "credible, first-hand experiences which shared socially" and "digital consumerism, self-directed buyer's journey" (Ramos, 2015). Figure 7 summarizes how a typical buying funnel can be visualized. However, the already addressed mega trends changed the availability of information sources and channels involved shifted the need for a model which is less linear to a more customer-driven approach which is a more circular model like the one with recurring interactions (Court et al., 2009).

Figure 7: Buying Funnel (Balinas, 2017)

When taking in the customer's perspective, this linear, staged process is also often termed "customer journey", which "involves all activities and events related to the delivery of a service"(Zomerdijk & Voss, 2010). Norton and Pine (2013) defined it as "the sequence of events – whether designed or not – that customers go through to learn about, purchase and interact with company offerings" these sequences are created to "deliver value to the customer, profitability to the company and differentiation from the competition". Further, it describes how "consumers make their buying decisions, from becoming aware of the existence of a need all the way to the final purchase of a product or service that addresses this need" (Jansen & Schuster, 2011). Every customer who uses a company's services or purchases products has at least one, but usually a large number of contacts during his journey which influence his perception of the company. At each stage, there are certain "touch points" of a customer with the brand, product or service, which can be considered as a moment of truth, where either a positive and negative experiences

can occur. Today the touchpoints are a constant interchange between the physical/social and the virtual/mobile world (Schüller, 2012).

It is a key success factor to combine these touch points to a journey of the customer which is as pleasant and smooth as possible, to build up long-term and intense customer relationships and to increase customer satisfaction (Zeidler, 2010). It addresses the part of the business strategy of how to create "customer-centered vision of the future and align the promise making and promise keeping efforts of an organization profitably" (Canfield & Basso, 2017)

This journey varies with the branch and product category and can last from minutes to weeks. Knowing all touchpoints and marketing channels with which a consumer comes into contact with this practical overview can help to address customer at the every possible stage of their decision making process perfectly (Holland, 2014). Customer behavior takes in the central position since every consumer has "different expectations, perceptions, and, consequently, levels of satisfaction at each touchpoint" (Canfield & Basso, 2017). Further, the business needs to "address the pain points in the customer journey with different measures that fit the financial, as well as strategic, profile of the customer segment" (Maechler et al., 2017). Figure 8 shows the different stages of the customer journey and the offline and online touchpoint where the customer gets in direct or indirect contact with the business or brand.
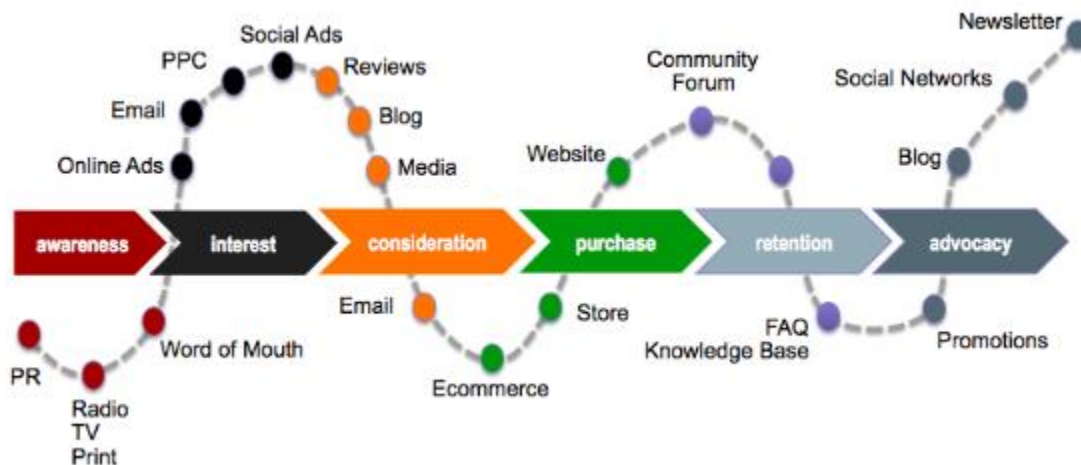
Figure 8: Customer Journey with Multiple Stages and Offline/Online Touchpoints (De Baere, 2015)

Mapping those customer journeys can tell a lot about the customer experience. Together with the company strategy they provide a coherent structure for the business model and can help to assess the customers' needs, value proposition, resource allocation, channels, and cost structure (Richardson, 2010). The concept of customer experience is not solely about offering a good product or service, rather "making a transaction pleasant, easy, convenient and quick" (Norton & Pine, 2013). Lemon and Verhoef (2016) also recognize an increased focus on customer experience because of multiple touchpoints along omni-channels which have to be managed and lead to even more complex customer journeys. This experience is "shaped by customers' expectations, which largely reflect previous experiences" (Meyer & Schwager, 2007), those experiences are in B2B context not very exciting ones but more "trouble-free".

When taking the ongoing online development in the business environment into consideration does this require a new approach for business modeling? Should business more include also the customer journey and experience within the value creation of the business?

As customer experience can also be seen as a source of competitive advantage, new models need to be developed which put the customer experience central to the business model innovation. Nevertheless, the applicability for B2B companies requires further research (Seppänen & Laukkanen, 2015). Weill and Woerner (2013) also propose an interesting new model to map the customer experience in digital business models. Those challenge the traditional physical models regarding three factors: Internal power, since owner and manager of the customer experience can be different; business processes, in order to manage the omnichannel presence and communication; and customer data, which take a more strategic role in the business "rather than remaining hidden in one area" (Weill & Woerner, 2013). Weill and Woerner (2013) suggest three components with being customer experience central in the value creation. From their viewpoint, a successful digital business model further needs to include good content and a platform to deliver and capture a unique customer value proposition (See Figure 9).
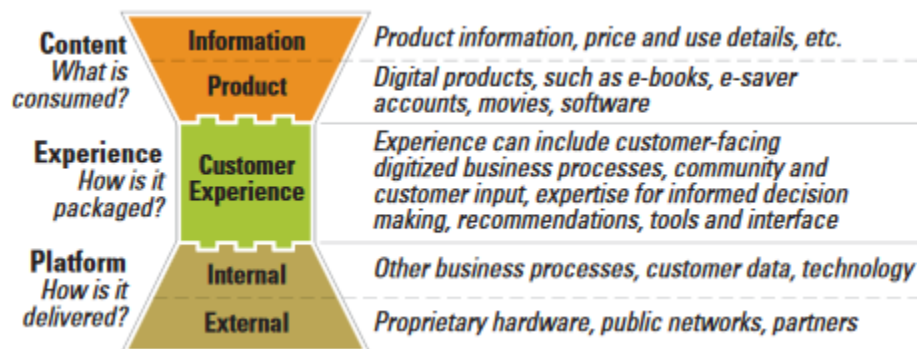
Figure 9: The Three Components of a Digital Business Model (Weill & Woerner, 2013)

Relating to the platforms, the funnel and customer journey aspect was also included within the new BMC for digital platform proposed by Scholten (2016). The author sees a need for a new two-sided digital platform model as the conventional pipeline models only deal with controlling the value chain and value is added in different steps of the chain from raw material to finished end-product. In contrast, new businesses are dealing with two networks, supplier, and customer side, and have maximized the benefits of those by aligning segments, value proposition and core interaction (Scholten, 2016)(See Appendix 3 for the full digital platform canvas). All of these models stress out the more central role of the customer and their online and offline experience in the business model. What all models have in common is their lacking applicability for B2B. Therefore, the differences between B2C and B2C need to be mentioned in the context of this research. In B2C interactions consumers are less likely to interact with a company representative directly, while in B2B consumers relationship with a sales representative in a later stage of the journey goes deeper (R. L. White, 2017). B2C consumers tend to move through the journey alone or only with some advisors, while B2B consumers have a larger buying group involved in the decision making process (R. L. White, 2017). Their journey is typically longer and more complex as multiple divisions are involved before the transaction happens. Aspects like co-developing a product with a supplier are more to be found in B2B relationships due to their long-term orientation with recurring

sales. Reordering is a crucial aspect of the journey, whereas in B2C there is often only a one-time purchase (Leake et al., 2012). Also, customization is more widespread in B2B than in B2C. Businesses need to be more flexible to meet the needs of customers segments to create value. Most obvious B2B business relations are more focused on individual relationships as buyers are limited. Therefore the prior mentioned aspect of loyalty is more crucial in a B2B environment (Leake et al., 2012).

To conclude a business needs four key capabilities to enable a successful customer journey (Edelman & Singer, 2015): "Automation, to smoothly carry customers through each step of their online path. Personalization, to create a customized experience for each individual. Contextual interaction, to engage customers and appropriately sequence the steps they take and journey innovation, to add improvements that enhance and extend the journey and foster customer loyalty."

Together with these capabilities and all this complexity of B2B relationships creates the need for a digital transformation of service, where the business needs to find the right balance between human and digital interactions. This digital interaction can be facilitated by using self-service tools for reordering, rather than talking to a sales representative. Overall it can increase the speed of interaction with suppliers which is often more critical for B2B decision makers than the actual price (Maechler et al., 2017). For organizations, one of the key questions which arise is concerned with the optimization of this journey and where personal or digital, fully automated self-service is preferred by the customer (Holland, 2014).

Managing this omni-channels structure becomes a key requirement as they impact how B2B companies sell their products and services. A successful implementation can drive higher revenue of sales, build greater loyalty and make buying more convenient with self-service tools (Попенкова, 2016).

All in all, one needs to get a complete understanding of what the B2B customer journey looks like for the customers and from an organizational perspective. With regards to the business model, it describes where the crucial touch points of the customer journey are and where and how value is delivered. The recent developments have shown that businesses often map the customer journey without any real participation from customers (Norton & Pine, 2013). Building on the models of Scholten (2016) and Weill and Woerner (2013), new models are required to assign the customer journey and experience a more central role with in the business model. Particularly since multiple touchpoints along omni-channels have led to more customer journeys which need to be managed (Lemon & Verhoef, 2016). Furthermore focus also needs to be put on the after sales service to cover the journey aside from the marketing aspects before the purchase to enable a long-term relationship which is desired in B2B relationships (Balinas, 2017; Leake et al., 2012; R. L. White, 2017).

3. Methodology

After elaborating on the theoretical background of the relevant concepts of business modeling, customer segmentation, buying funnel, customer journey and experience this chapter explains the methods used for this research. The explanation of the research design is there to show how a solution for the research setting and question is derived. Further, it will be explained why these selected methods are appropriate for this research. After defining the theoretical landscape by means of a literature study, the second method is a field and internet research on the industry and segment characteristics. Third, are semi-

structured interviews with different stakeholders including employees of the company and current customers of the chosen medical segment are conducted.

3.1. Research Design

The Dutch company Global Electronics strives for sustainable growth in all their current market segments especially targeting for startup businesses. A well-founded approach is therefore needed to establish a strategic and operational orientation for the near future, which is in line with the online marketing strategy including the new website. The goal of this research is to come up with a suitable business model tailored for a specific segment, reflecting the business side of the interaction. As businesses become more and more customer-driven, the specific steps in the customer journey also need to be identified, and how they are should be integrated into the business model. To receive the full picture of the interaction between customer and supplier several subquestions need to be answered conscientiously, which are listed in 1.2.

As the study is based on qualitative research methods, a "real world setting [where] the researcher does not attempt to manipulate the phenomenon of interest" (Patton, 2002) is analyzed in. In contrast to quantitative research, validity and reliability of the study are not specifically defined and do highly depend on the ability, effort, and skill of the researcher (Golafshani, 2003; Patton, 2002). As Golafshani (2003) explains: "although reliability and validity are treated separately in quantitative studies, these terms are not viewed separately in qualitative research. Instead, terminology that encompasses both, such as credibility, transferability and trustworthiness is used. [All in all the] quality of research is related to the generalizability of the result and thereby to the testing and increasing the validity or trustworthiness of the research." So within this research, the generalizability of this research is limited and depends on the executor's data collection, analysis and individual perception of the problem.

This research is based on a single explorative case study at Global Electronics BV the method is entirely suitable when an in-depth understanding of the phenomenon in a real-life setting is needed (Yin, 2013). Case studies are typically limited by time and activity, while the "researcher collects detailed information using a variety of data collection procedures over a period of time" (Creswell, 2013).

In this case, through the combination of desk research and interviews, data will be collected to determine company characteristics, strategy, capabilities, market segments, size and development in relevant markets segment. The resulting overview of relevant business activities and touchpoints of customer journey related to the delivering of the value proposition should help GE to formulate their targeted marketing strategy for specific segments and to redefine their online and offline channel strategy if required. In the end, a sustainable pragmatic and actionable methodology should be developed to optimize and maintain its offline and online channel activities on a regular basis. By the in-depth analysis of one specific segment insights should be derived how to target this segments and which aspects are fixed or may be translated and applied to other communication with other relevant segments as well.

3.1.1. Web and Document Research

After the literature study, the second part of this research consists of a field research, mostly based on company and web research, to determine the market segments, size and development possibilities. The websites "Elektoniknet.de" and "Venturescanner.com" were used as the main online source to evaluate the size, capabilities, services and other organizational attributes of potential customers and competitors within the medical market. The medical segment was selected as the case company already has some expertise in this area, but aims to further develop within the certified, high-tech direction which matches with the basic characteristics of the segment. To receive a better understanding of the broad industry spectrum, first a general definition was derived, and later market size, attractiveness and required competencies for each of the subsegments were determined. The attractiveness of the subsegments is based on the number of startups worldwide and the fit between the identified needs and competencies offered by GE. This analysis is conducted to estimate the future potential for the related subsegment and growth opportunities. The resulting overview of the segment of health technology should help to specify the subsegment according to the mentioned attributes and target the marketing affords.

Before this web research, an analysis of organizational documents and information was conducted to get more insights into the organizational structure, characteristics, service, and capabilities. The types of records were mostly official company presentation and plans ("Bedrijfspresentatie", "Toekomstplan"), but also the content of the new website. Those written documents are not listed in detail for confidentiality reasons. In general, company documents are seen as more reliable and objective source of information than the opinion of the employees, which could be influenced or biased (van Aken, Berends, & Van der Bij, 2012). They help to give a better understanding of the compound research setting but are limited in the sense that they only include information preselected by company representatives. Chosen documents were investigated with a focus on how the specific blocks of the business model are defined and communicated to the relevant stakeholders. Furthermore the new website design and content serve together with these documents as a foundation to construct and evaluate the business model with regards to the customer journey. The obtained data also provides insight into how these constructed models relate to the formulated mission, vision and strategy, which provided a good overview of the strengths and weaknesses of the case company on what to focus on during the interviews.

3.1.2. Semi-structured Interviews

The third part of this research is qualitative interviews with employees and managers of Global Electronics and Dutch and German customers. According to Stuckey (2013), three types of interviews are common: structured, semi-structured, narrative interview. These range in openness including specified sets of questions to the telling of respondent's stories in an organic way. Classically structured interviews have sequential and a defined order of questions. Whereas, semi-structured interviews are more flexible and free-form. The interviewer can reflect on the answer of the participant, interact with the interviewee and maybe frame a different the next question. Narrative interviews also called unstructured interviews usually ask for open-ended question about a respondent's experience (Belk, Fischer, & Kozinets, 2012; Stuckey, 2013).

Even though they have less validity, for this research semi-structured interviews are selected to have the flexibility to address other issues and directly react on the previous answer of the respondent, provide an explanation when required or frame the question differently if answer drifts in an unintended direction. All in all, the interview questions slightly differed from employees, managers, and customers, selecting a different focus of the business model and adapting to their expertise and knowledge. The questions were based on the literature review and the information gathered while doing the field research.

In total six different respondents were interviewed. The selection of the interviewees and more information about their background will be explained in the next section. All answers of the respondents were used to make proper recommendations, as the aim of this research is to determine the right mixture and configuration of business model building blocks in relation to the customer journey of the medical segment. The input should facilitate the overall strategy the company is following and provide a recommendation for similar businesses how a business model and associated innovation can sustain development in a new B2B market segment. By applying the multiple data sources approach this form of data triangulation helps to increase the validity of the measures (Mays & Pope, 2000).

3.2. Data Selection, Sample & Collection

To get the best view of the strategic positioning, the overall business model configuration of the company and the perception of the current state, a wide range of respondents from different backgrounds is required. They can provide a different perspective and contribute to specific parts of the business model and its design.

First of all, data was collected with the help of internal documents, their company website and business presentations held at fairs. The first interview block was conducted with two employees of GE, to gain a better understanding of the internal processes, capabilities, values which together with the company documents, mission and vision create the overall business model of Global Electronics.

The second block of interviewees consists of the four existing Dutch customer within the medical/health segment. This mixture of different customers and employees creates a homogeneous sample, which is more reliable than a one-sided perspective on the customer-supplier business relationship. Furthermore to also reduce the personal bias customers were anonymized (Baxter & Babbie, 2003). List of respondents:

Respondent	Position
• Meino Toering	Interim Manager, Global Electronics
• Jeroen Schuiling	Sales Manager, Global Electronics
• Customer 1	Product Design Manager
• Customer 2	CEO
• Customer 3	Hardware Design Engineer
• Customer 4	CEO

All of the interviews conducted included semi-structured set questions as a guiding framework. Some spontaneous extra open questions were added later within the interview process to receive the most

valuable insights about the internal capabilities and customer segment. The schedule of the interviews was set for 30-40 minutes and kept for every interview.

The interviews were conducted in person or via Skype/phone and were recorded with an audio device, with the permission of the interviewees, to transcribe and analyze the answers in detail. If required the respondents had the possibility to check the questions beforehand to avoid any discomfort. However, to receive more representative and spontaneous responses to the questions were not completely discussed in-depth before conducting the interview.

3.3. Operationalization & Data Analysis

To analyze the business model, the industry and the medical segment and how their customer journey can look like, the operationalization of concepts combines the business and the customer view of the relationships to cover the full picture the study. As Neuman Lawrence (2014) define: "researchers operationalize by describing how specific observations and thoughts about the data contributed to working ideas".

In this research setting the business context is critical, which is based on an SME in a high-tech B2B environment. The findings from the web research, organizational documents, but also from the five forces part of the employee interviews are combined to define the industry and the segments. However, the operationalization also needs to emphasize the social context for understanding the world and include trends like the identified digitalization and globalization to evaluate what came before or what surrounds the focus of study. Furthermore, the context is important as same behaviors or characteristics can have different meanings in different cultures, which limit the generalizability. As this study aims to combine on the customer-supplier interaction with the market segment, the questions were formulated differently for the two groups of respondents according to the following concepts (See figure 10).

Employees	Customer
• Four Customer-centric Business Model Blocks (Osterwalder & Pigneur, 2010)	• Values & Capabilities of GE
• Sales Funnel Stages (Balinas, 2017)	• Sales Funnel Stages (Balinas, 2017)
• Five Forces (Porter, 1980, 1985)	• Specific Services of GE
	• Digitalization & Automatization of Services

Figure 10: Concepts covered in the Interviews

The customer journey and the steps in the sales funnel are not clearly defined in the literature the operationalization of the stages is strongly influenced by Balinas (2017) classification (See figure 11).

Stage	Operationalization
Awareness	• First contact
Interest	• Information Search
	• Online vs. Offline
	• Search Terms
Intent/ Decision / Evaluation/ Desire	• Search for Alternatives
	• Criteria of Selection

	• Possible Problems with Prior Supplier
	• Personalization/ Customization of services
Post-Purchase Support	• Evaluation of service & possible improvements
Loyalty	• Commitment & Trust
	• Satisfaction with the results/ product
	• Incentives to buy again/ faster,
	• Maintenance of customer-supplier relationship
	• Form of contact
	• Form of coordination and collaboration with suppliers? (Value Network)
	• Possible Reasons to switch
Referral/ Word of Mouth/Advocacy	• Recommendation and Business Referral to other partners
	• Promotion via online channels

Figure 11: The Operationalization of the Specific Customer Journey/Funnel Stages

The full list of questions for the employees and the customers of the medical segment can be found in Appendix 4 and 5.

As mentioned the interviews have been recorded with the permission of the interviewees because an extensive transcription is required to analyze the responses. Those transcripts are used to analyze and describe the business model from an internal view, but also how the customer perceives the value. While this type of data analysis is purely descriptive, during this explorative case study the customer journey and the specific touchpoints identified are more measurable, for example, lead generated or conversion rate of sales. Nevertheless, this measurement goes beyond the scope of this research, as it only aims to set priorities for certain phases of the interaction to facilitate the configuration of the business model and the business/marketing strategy. The feedback from the existing customers can further help together with the identified priorities to align the internal processes which need to be adopted for a successful communication and implementation in the B2B context. Therefore, in the next section quotes of the respondents are used to give a good representation of the interviews, which were executed in English.

4. Analysis & Results

After the relevant literature has been reviewed and the field research and interviews with suppliers were conducted the gained insights are now applied to the company case of GE and presented in this chapter. The findings are structured in three main parts.

First, the business context will be discussed to set the boundaries of the business model and also define the competitive landscape. Second, the business model is developed, and the four customer-related building blocks are elaborated in detail mostly based on the company documents and the results of the interviews with the employees. Third, to integrate the customer perspective the customer journey of the selected medical segment is shown up. Here also the feedback from the employees is taken into

consideration, but mostly the experience and judgment of the customers are used to map the typical customer journey and highlight the most critical touchpoints.

4.1. Case Study: Global Electronics, Business Context

This part describes the industry in which GE is active in, their scope of operation, supply chain, biggest player, industry forces and sets the framework for the business model. The questions to be answered within this part are listed in 1.2 under "Understanding the Business Model & Environment".

GE is an EMS (electronics manufacturing services) company and assembles, tests and sells printed circuit boards (PCB) and end products, where PCBs are a part of. GE focuses on customers who perform the development of the product itself or outsource it to developers. The testing of the feasibility and the guidance and preparation of production is what GE sells as a service. GE does not develop products themselves but is preferably involved at the end of the development process to ensure that the product is adequately made. GE also supplies related services such as final product assembly, finished product testing, ensuring full traceability of products, and temporary support/lending of specialists. The personal services range from design, prototyping, development, fulfillment, shipment to after-sales support. GE facilities guarantee a competitive price when large volumes are delivered, but also optimal quality for high-end electronics for high-tech end products.

As the electrical manufacturing sector is changing rapidly also the demand for a broad range of services is increasing. Therefore larger players are more and more choosing to outsource non-core activities to cope with the downward trend of revenue margins, time-to-market pressure, and batch sizes. Product diversity is also increasing due to constant innovations and developments within the industry, LED applications to represent a good example of these industrial developments. This development positively influences the demand for high-quality products, but the focus on all stakeholders and the environment are playing a crucial part in today's production. Recent trends within the industry show that more and more products are electronic control driven by technological developments like IoT or LORA, together with the digitalization and automation of organizational processes (Hooper, 2017; "Trends Shaping the Future of Electronics Manufacturing Facilities Management," 2017).

Industry characteristics are changing from built to last to designed for change. Local presence of 'EMS services' seems to be self-evident, furthermore specific requirements in quantity, quality and reputation lead to a fragmented supply side of relatively small businesses. These specific requirements not only concern technical possibilities but also purchasing, logistics and personal support also provide value for customers. In addition, online marketing activities and creating the right customer perception regarding flexible delivery times, the presence of production facilities for small and large series and the cooperation with the customer are evident.

The Ministry of Foreign Affairs (2017) sees an: "increasing integration of industry and information and communication technology, the increased need for energy efficiency and the growing industrialization of emerging markets offer growth opportunities […] for suppliers of electronic and electrical components."

Further, they see that "European OEMs are increasingly shifting the multi-partner cooperation approach to a single-provider or EMS ", which supports the idea of a value network which becoming increasingly more important, especially for SME which try to compete with the bigger companies.

Concluding to say about the high-tech EMS industry is developing "in Europe, while lower and middle-end assemblies and components are being made in developing countries."(Ministry of Foreign Affairs, 2017).

With regards to the strategy of GE, based on the company documents, their focus is more on expanding to Europe. They have discovered that also in countries as Germany, Spain, and France there is high demand for high-tech electronic assembly and apparently in the country itself the service is not as good as in the Netherlands. Regional partners are always interesting, but as more and more European countries looking to the Netherlands for their electronics assembly great opportunity for GE. By looking at their strategic positioning, GE can be placed in a classical Ansoff-Matrix (1965)(see figure 12).

	Existing Product	New Product
Existing Market	• Acquire Online • Visiting existing customers • Visits prospects (new customers)	• Convince more customers to spend big series with • Investment in loaders, we can offer these volumes even more competitive • Sales of services
New Market	• Startups in periphery UT guide • Realize medical certification • Explore and acquire new customers from Germany (possibly with existing customers) • ABDO, Defense & Government	• No long-term goals set • Constantly monitor the technical and industry developments and opportunities

Figure 12: Ansoff Matrix (1965), Global Electronics

Referring to the interviews the employees see the market as really competitive. Using the Five Forces Model (Porter, 1980) to further elaborate on that.

First, new entrants are not as common as the market is big enough and there are several focus areas, whereby GE mostly focuses a lot on startups. This expertise, interest, and risk taking attitude create a certain niche within GE is operating in. Barriers for others are therefore more based on GEs service level focus and not on the technical side.

> *"You need to invest in machinery, equipment, but also in the workforce and skillset to operate the machines. From Asia we do not face that much competition because they are serving other markets, where huge volumes are common." (Interim Manager, Global Electronics)*

Second, substitution is not an issue in the industry. Commonly businesses fear the replacement by digitalization, automatization or vertical integration. In the case of EMS providers, this is not likely as they only offer services and do not possess own products. Closely aligned to the threat of new entrant the investment costs would be higher for an OEM than just outsourcing the production process.

"More the other way around, many more products are based on IoT and have a need for electronics. So there are constantly coming new products within the market, where components are required. So the market volume in itself is growing." (Interim Manager, Global Electronics)

Third, buyer power is typically on the customer side. There are no fixed margins regarding costs. Customers usually want fast delivery against the lowest price and the faster the delivery, the higher the price. Order size and loyalty can play a minor role in the power distribution and determination of the price, but customers in the high-tech industry seek for a supplier who can offer the full range of service, so the price is not the primary decision factor.

"The power is basically on the customer side, but if you can explain why a certain cost has arisen, then you can pull a little bit of power back to you, to have a leveled playfield for negotiations." (Sales Manager, Global Electronics)

Fourth, supplier power or more over the market is two-sided, there are small suppliers where an even distribution of power is expected, and negotiations are possible, and then there are larger businesses which publish catalog prices, prices are fixed.

"A problem is most of my customer's don't work with a rolling forecast, so to my suppliers, I cannot say, I am expecting to make 10.000 pieces this year, give me the best price for 10.000. I always have to ask for prices in low volume on a project base." (Sales Manager, Global Electronics)

Switching between suppliers in this industry is also not so easy because, in the development stage, the key components that are used on a PCB are supplied by one or two suppliers, and often they pull the project to them to be the exclusive supplier of those components. Exclusivity of delivery rights is ensured in the form of contracts with the end customer or the developer resulting in higher prices. Nevertheless, in the business of Ge flexibility in lead times of suppliers, so the availability is more important than the pricing.

"There are trivial small suppliers that offer us specialized components, for those components, we can negotiate, and there is there are big suppliers millions of components, where we have to accept the list prices." (Interim Manager, Global Electronics)

Fifth, rivalry among competitors appears to be high at first sight when listing up all EMS providers in the Netherlands which are about 160 companies. When taking a look at the German market where GE is also active in, the "Anbieterkompass" a list of nearly all EMS providers in Germany the numbers sums up to 344. Resulting from that the competition is assumed to be immense. However, when looking at direct competitors in the Netherlands regarding the size of the company, level of turnover or number of people employed, then it sums up to about half of that, 80-100. This number can further be relativized by looking at the regional competition.

"But if you look at the region, let's say 50km from GE there are about 10-15 competitors, from this 5 are real competitors, in terms of they provide the same services, size, technology, etc. If you

look at it on a national scale, we have quite a lot of competitors, but on the regional scale, it is not so much." (Sales Manager, Global Electronics)

Concluding to say about the competitive characteristics in the high-tech EMS industry which set the boundaries for the business model. Low threats from new entrants and substitution create a stable environment and service level, and expertise protects the business from disruptions. Suppliers often pursue their power as the only a few players are on the market and the SME have to accept the catalog prices and binding agreements, EMS business can only achieve cost savings via volume, but in the high-tech industry quality and short lead times are more important the price. In contrast to that the power relationship with the buyer is dependent on the nature of the business, but if the EMS provider can explain why a certain cost has arisen, then they can pull a little bit of power back.

4.2. Business Modelling

Based on the company documents and the two interviews with the manager and sales manager the following four major building blocks of the BMC model are set up, which can be seen in figure 10. In the next section, each of the four customer-centric business model blocks will be discussed, namely value proposition, customer relationship, channels and customer segments by mainly focusing on the internal view of the business. The other minor important block can be found in Appendix 6 and the full BMC in Appendix 7.

Value Proposition:	Customer Relationships:	Customer Segments:
• Flexible Production Line • Smart Sourcing • IP Trust • Fast Prototyping • TQM • High Quality • Full Traceability • Box Build • Startup Support	• Co-creation • Cooperation • Personal Assistance • Communities	• Security • Defense • Industrial • Medical • LED • Startup • Robotics • Internet of Things
	Channels: • Website • Social media • Online Ads • Fairs • Networks	

Figure 13: Business Model Canvas: Global Electronics

4.2.1. Value Proposition

In order to describe the value proposition, the business needs to know the right mix to communicate unique customer value proposition to attract the targeted customers. Capabilities, values and unique selling points are of importance and will be outlined based on the company documents, employee interviews but also the customer first perception.

Mirroring their mission and vision statement, GE relies on corporate social responsibility (CSR) principals to use their knowledge and skills to deliver high-quality products to their customers. By thinking together throughout the whole process and using their experience, GE creates sustainable added value for their customers. The constant innovation in manufacturing techniques and processes taking into account people and the environment, allows GE to set the standard, with regards to services when it comes to electronics manufacturing in the 21st century (See Appendix 8 for complete mission/ vision statement). The value is not the product itself but the services around it. Like delivery time, prototyping, the quality standard which is achieving, as well as the pricing. This very high-quality standard is then supplied the high-tech industries.

> *"GE is known for its flexibility, thinking along with the customers, to bring pragmatic solutions, to problems that maybe customer have. And our high quality vs. fast delivery time, those are the most important things that GE is known for within the market." (Sales Manager, Global Electronics)*

Based on the company documents in the following GE's offerings are presented. As EMS providers usually do not have any own products the produce only end products where a printed circuit board is part of. The surrounding service which creates a unique value proposition are listed below, but need to be further distinguished and ranked to set priorities in marketing and target the specific segments.

List of Services:

- Assembly of printed circuit boards
- Box Build
- Testing
- Project Management
- Guidance on re-design of products (pro and reactive)
- Advice on optimizing product ability
- 3D-printing

- Full traceability
- Testing of circuit boards
- Assembly of the final product (box build)
- Lending of staff
- Data processing
- Industrialization: from prototype to mass production
- Fast prototyping

The customers especially value the flexibility in services and production capacities. Due to the capabilities of GE to offer an extra flexible production line to ensure fast prototyping the company can guarantee short lead times. The resulting flexibility is crucial in the development phase of the product, to continue with further testing rather ex- or internally with self-developed testing equipment, customized to the product specifics of the each board.

> *"It is really flexibility in processes. You can say fast deliveries, but typically when you go to production facilities, you get certain lead time back. They always manage to put a batch somewhere in the production planning to help us out on the shorthand" (Customer 1)*

As customers outsource their production/standardization processes, they can focus again on their core business of flexibility in services for their clients the end consumer. Fast delivery, repair, and customization are facilitated by GE, which enables a customer friendly environment for the customer. Free flexible capacities, quality, trustworthiness and the close cooperation create the value proposition

GE is known for and is of major interest also for startups which especially values constant guiding in their development phase.

> *"They can easily switch between things because one time is changing some drawings, or having some question on screws and bolts and stuff, really the small things. They are really willing to think with you instead of only doing the things which are written down. Understanding."(Customer 2)*

So as the customer indicated flexibility is not only valuable when it comes to processes rather value can further be generated by thinking together. In the case of prototypes, it is very depending on where the customer is the design phase if they are already working towards the detail phase or still in the conceptual phase. Therefore, flexibility is also about thinking along with the customer and not only about time. Know how to act in certain situations combined with high-quality and trustworthiness is something that is hard to copy by a competitor and can create a unique value proposition.

4.2.2. Segments

The selection of segmentation method can at least have six different forms (Nguyen, 2016), to identify the most attractive customer groups. However, also to define the needs of the segments and resulting from that which capabilities and services are valued the most by a specific segment. Arising from that, as mentioned in the theory part, segmentation can improve the product offerings, focus the marketing message & valuable opportunities to pursue higher quality revenues. In the case of GE the segmentation is based on the industry type and characteristics the company is mainly active in. GE serves mainly all industry segments which require high-tech PCBs (see figure 10). However, they see that these segments do not matter as all require low till mid-volumes, highly standardized quality requirements and short lead times.

So aside from the industry characteristics, the customer base can be split up into two categories one for prototyping and one for series production. Moreover, this is not a regular segment rather represents the type of production facility within the organization.

> *"First we are looking for customers who need fast prototyping of high-end electronics, so complex boards that can be manufactured within a short amount of time with high quality. The other category is customers that need mid to high volumes electronics in a broad sense." (Sales Manager, Global Electronics)*

The ideal customer in the eyes of GE is of medium size and has constant demand and long-term rolling forecasts, which means they can predict their future demand for at least one year. This preferred high planning security also increases the costs for the consumer as components can be bought in higher amounts at one supplier.

> *"[…]Demand for mid volumes, between 1-10.000 pieces a year, divided into several batches all over the year. Mid-volume and lower volumes are our target group." (Interim Manager, Global Electronics)*

Certification can further determine the segmentation as GE currently own the ISO 14001, 9001 and the data certification called ABDO. Further GE is in the process to attain the medical certification ISO 13845. Regarding accreditation, a distinction can be made between customers who are attracted by them and customers who require them. Customers who need a certification are more in high demand, where pricing is therefore often different than for customers which are only attracted by a certification. They are also willing to pay a little bit more for their product because they know the product is made by a certain standard. Aside from the segmentation based on the industry and certification requirements also the organization maturity is of interest. GE has put special focus startup business in all high-tech electronic industries. This emphasis is a relatively unique approach as they can offer stock, risk and financial management next to the standard manufacturing services. They further have the expertise and interest and are willing to take the higher risk that is associated with startup businesses. When focusing on this segment business is not so much about service rather about personal relationships and frequent exchange of knowledge and feedback, which brings us directly to the next building block to be discussed in the context of GE.

4.2.3. Customer Relationship

From the theory, we have learned that there are diverse approaches to the customer relationship. Ranging from personal assistance, self-service, automated processes, communities to the highest level of integration which is often termed co-creation (Al-Debei & Avison, 2010; Lusch et al., 2010; Osterwalder & Pigneur, 2010). For a business, it is crucial to know which form of the customer relationship is preferable to ensure successful customer retention. Deeply aligned with the channel usage at first trust and confidence have to be developed to become successful business partners. Here the personal contact is often unavoidable as trust cannot fully be built via a website. GE also prefers this personal contact as the conversion rate, and persuasion of capabilities is made much easier.

> *"Once we have potential customers here in-house, 9 out of 10 they decide to do business with us." (Sales Manager, Global Electronics)*

When it comes to the duration of a relationship, GE prefers a recurring business with long-term relationships, as it is common in the B2B market with the higher complexity of the decision processes and product characteristics involved (Leake et al., 2012; J. White, 2017). A loyal customer base is a basis for a sustainable business model. Therefore GE established different preferred customer relationship as for some customers the service is low key but has a high impact on the business performance when it does not work, so expectations and requirements need to be met.

> *"Customers are really loyal to GE, so they are also very local to our competitors, so that is why it is hard to get new customers that are coming from our competitors. So we could new customers by facing startups and new initiatives." (Interim Manager, Global Electronics)*

Co-creation of value, so the direct influence of the customer on the value proposition, is also an increasing form of customer relationship applied by GE. A frequent collaboration and exchange of the new trends and new components clearly can be seen from supplier side. The customer can also have the

initiative by redesigning their current product, which impacts the PCB. Trends like the "Law of Moore", that component half in size every two years are still pushing customers to come up with new designs, which are even smaller than the previous one. Initiatives from GE to proactively develop the product can strengthen the relationship and further create trust in the expertise. Aspects like obsolescence, so components being dysfunctional within a given period, further create the need to redesign the product. This information is gathered from GEs suppliers and is shared with the customer. Partially co-creation can also be initiated by the customer as they can actively influence the value proposition of GE by demanding for new services, which may be added to the scope of offerings after some internal discussions.

> *"One of my biggest customers is now asking us to do cable assembly which is not our core business, but it is an attractive proposal, so we are seriously looking into it. And we noticed that other customers also are interested in these kinds of services. This also fits with our flexibility capabilities, to include such a new service. And we are also willing to invest in such kind of extra services." (Sales Manager, Global Electronics)*

Another form of customer relationship which is also present at GE is communities. Like for many B2C businesses online communities used for exchange can foster loyalty and add extra value as a particular form of co-creation. In the case of GE, these are more professional communities and institutes, where information is shared via newsletters, or personal meetings are held on trade fairs. This useful knowledge about trends in the market helps to track the recent developments and potential business opportunities in the near future but also enables to estimate future risks and uncertainties better.

> *"We are a member of some institutes that keep us informed about certain customer demands, in certain regions and segments. Through this way, we are being kept updated, on opportunities." (Sales Manager, Global Electronics)*

All in all, a deeper form of integration and co-creation, which includes sharing of knowledge, data, and resources, is preferred by GE. This integrated business relationship can lead to a value network that can further benefit the value proposition if customers and suppliers demand the same level of cooperation and coordination. Further this through this network helps to acquire new business contacts, information on new components and potential customers. Closely aligned with the customer relationship is the selection of the right channel as a personal relationship can only be established by matching it with the right way of communication.

4.2.4. Channel

Recapitulating the theoretical foundation of the channel structure, they are in place to deliver the value proportion, reach and connect with the targeted customer segments (Osterwalder & Pigneur, 2010). By establishing cross-channel services, the company can increase their customer experience, loyalty, and sales (Deloitte, 2013). In the case of GE, the interim manager and sales manager mentioned different communication and marketing channels applied to advertise and regularly contact the potential and existing customers. Traditional partner channels like partner stores or wholesalers are not used since GE only provides a high-tech serve and does not sell their own products.

Channels used by GE:

- E-mails
- Telephone calls
- Personal contact
- Corporate website
- Social media incl. LinkedIn, YouTube, Twitter, and Facebook

- Fairs
- Institutions
- Business Partner
- Brand ambassadors
- Online advertisement

GE most commonly uses face-to-face communication with its potential customers and existing business relations. Personal meetings, e-mails, and telephone calls are used to communicate with their customers on a daily basis. However, also the personal network of each sales employee is important when reaching for new customers. Because personal contact and face-to-face communication are limited, seminars on exhibitions about a certain topic are seen as an opportunity to make new direct contacts with potential customers. Furthermore, the online presence is getting more and more attention to create awareness and provide the necessary information for a contacting-decision.

> *"We are also using online, as we are now developing the online strategy, by presenting us as a highly dedicated and high-quality company. But there is really some competition there. So we need to find an innovative road to market by offering new services and all kinds of things around it. My hope is that the online marketing will offer us a lot." (Interim Manager, Global Electronics)*

As mentioned the online channel of particular concern when it comes to the first two channel phases, the creation of brand awareness and information used to evaluate the value proposition. This is currently the most challenging channel strategy part as GE needs to let the targeted customers know what kind of capabilities they can offer.

> *"Showing them those capabilities is the challenging because there are many local players around which can do partly the same but from the complete scope of what we could offer. Attracting them, that's really the challenge. Once they visit us here in Haaksbergen, then we could easily convince them." (Interim Manager, Global Electronics)*

With regards to the form of content GE provides they need to find the right mix between informing, entertaining, interacting and selling (Armelini & Villanueva, 2011). They use social media quite a lot, at least two or three times a week on LinkedIn, Twitter and Facebook. They are also working on case studies to put on the website to inform potential customers about the success stories other companies have experienced when working together with GE. The new website will also contain weekly blogs with all kinds of subjects directly related to the PCB manufacturing industry. A less used channel is newsletters which are shared if major decisions and information need be communicated to potential and existing customers and a few suppliers.

Furthermore, external online channels can also be used for advertisement. A continuous Google AdWords campaign is for GE the major expense of creating general awareness online, as they aim to be as high on Google as possible. A different channel that GE also uses to create awareness is brand ambassadors. Those are three delighted customers, which GE has asked to raise awareness for GE in

their own network actively. They try to promote GE as much as possible in the engineering business, if they develop new boards for customers or when they get an assignment. By trying to convince the customer once the board design is ready to do business with GE they can rely on these professional references. This advertisement channel is an entirely non-paid activity and relies on a voluntary basis. Nevertheless, it is expected that a win-win situation will result from this form of partnership. GE also monitors their after sales customer satisfaction and tries to receive feedback on a regular basis via survey with a representative group of customers, which seem to be satisfied with the current service offerings according to the company representatives.

After discussing the most relevant building block of the BMC relevant for the business interaction with the customer. It can be summarized that currently, the biggest challenge for GE is to find the right channel structure in order to create the necessary awareness in combination with strong content which can convince customers from various segments and different maturity stages to start a business with GE. As it looks right now the value proposition in combination with mostly very personal customer relationship is unique enough in the market to rely on this sustainable business model for the future.

Turning back to the channel phases (awareness, evaluation, purchase, delivery, after sales) mentioned in the BMC, which are critical when it comes to evaluating the marketing/sales process, but especially to identify at which point potential customer acquisition or retention may be hindered. This part of the BMC brings us to the concept of the customer journey, which extends the original channel phases and translates it into a more tangible customer journey. How this journey looks like with insights from the customers will be discussed in the next section with a particular focus on the medical segment.

4.3. Customer Journey of the Medical Segment

Before turning from the business side to the customer and their journey, a deeper understanding of medical segment is required to be able to evaluate the size, potential, characteristics of the segment and nature of business relationships within this specific industry. First, a broad overview of the medical segment will be presented, followed by the detailed customer journey description based on the interviews with the current customers of GE.

4.3.1. Overview Medical Segment

Describing the medical segment based on the online and field research, this segment includes a variety of applications for the use of electronic devices where PCBs are a part of. Medical devices range from diagnosis, prevention, treatment of disease to other health or medical tracking equipment. Even though a huge variety of application areas is present, the European Ministry of Foreign Affairs researched that EHealth only accounts for all small fraction (3,1%) of the world market segments for electronics and electrical engineering (see figure 14).
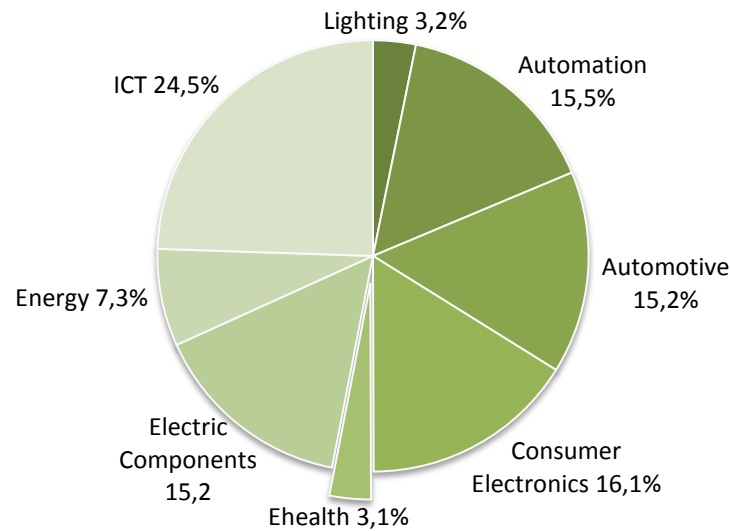
Figure 14: World Market Segment for Electronics by Industry (CBI, 2016)

The new field of eHealth and telemedicine industry is a well-established industry in Europe. As the (CBI, 2016) described "it benefits from a sophisticated health system with a high level of demand for technology". Huge players dominate the market like Philips and Siemens. Nevertheless also a lot of SMEs are in the markets which mainly distinguish with customized products and services. It is recommended to constantly keep track of the industry quality standards customers demand to stay competitive. While it is assumed that the "industry will remain strong in Europe in the short and medium term due to its proximity to the large European sales market " (CBI, 2016).

When taking a closer look at the Dutch market the Health Holland Guide (2016) defines the characteristics of the Dutch medical sector as followed:

> *"The Dutch Life Sciences & Health sector has a very strong reputation. The industry has a broad spectrum ranging from medical devices, high-tech, and e-health to hospital building and public health. It also includes education & communication, nutrition, bio-medical and pharmaceuticals. […] is working on enhancing healthcare through innovation. Through efficient, effective, accessible, comfortable and high-quality healthcare solutions, costs can be reduced while capacity increases and the quality of care improves"*

With all this complexity and diversity within the segment, a focus for the company has to be set to target their marketing message. Therefore based on the categories proposed by "Venturescanner.com", which is analyst and technology powered startup research firm tracking more than 1,000 Health Technology companies across 22 categories, a preselection of high-tech subsegments for GE was made (see figure 15) ("Health Technology," 2016). In the table attractive and size were judged based on the assumed fit with the company's technical competencies and value proposition. A detailed explanation of the individual subsegments can be found in Appendix 9.

In general, it can be distinguished between home and professional consumers, while most home appliances and the related start-up in the area of IoT (Internet of Things), which are smart connected devices, often only supply software (e.g. apps). Therefore this subsegment is rather irrelevant for GE as a

producer of physical goods. With the professional segment, some subsegments are also more attractive than others. All the new technologies and companies in communication, telehealth, and remote monitoring do not represent the target group of GE as the also only provide the software and often rely on existing hardware to distribute their programs. Based on this subsegmentation the "Digital Medical Devices & Diagnostics" are the companies GE wants to attract in the future with their new marketing affords. They fit best with the competencies of GE, as they are IT-enabled medical devices and diagnostic tools for example used in surgery or as monitoring/ detection equipment ("Health Technology," 2016).

Segment	Subsegment	# startups 2016 world	Attractiveness/ Size in NL	Competencies
Home Consumer	IoT Health Care	185	**-** only apps/ data from existing trackers/ no new products	Identification of suitable business opportunities
	IoT Fitness	142	- only apps/ data from existing trackers/ no new products	Identification of suitable business opportunities
Professional	Digital Medical Devices & Diagnostics	158	+ best fit with our competencies	risk reduction, full traceability, quality standards, Life cycle management
	Electronic Health/ Medical Records	98	- only platforms	Not relevant
	Healthcare Mobile Communications/ Messaging	28	o/- often only software	Not relevant
	Healthcare Robotics	12	o complete in-house development & production	risk reduction, full traceability, quality standards, Life cycle management
	TeleHealth	130	- often only software	Not relevant
	Remote Monitoring & Family Care Management	70	- often only software	Not relevant
	Gamification of Health	32	- only software/ niche segment	Not relevant

Figure 15: Subsegments of the Medical Segment ("Health Technology," 2016)

4.3.2. Customer Journey

After discussing the scope and relevance the medical segment in relation to GE, this research tries to map a typical customer journey by means of customer interviews (full list of questions see Appendix 5). At first sight, the concept seems easy. The customer journey is an extended and detailed sales funnel with service and loyalty behind. By identifying the main obstacles during the customer journey in a digital and global B2B environment, a fit with the business model can be ensured. As listed in the 1.2, to ensure this fit one needs to know: Which channels influence the customers? What touchpoint do they

come in contact with to get information about the business? What (online) communities do they belong to? What is the role each channel plays in moving the customers to make purchase decisions?

Starting with the first phase, awareness nowadays is more and more created via the online presence. However, does this also apply to the medical B2B segment? Since 3 out of 4 customers have a long lasting business relationship with GE, they mainly got aware via personal contacts. Networks of an employee but also the reference of customers seems to be valuable within this segment. Only the newest customer got further aware of GE over the online channel, while the initial contact was again via personal contact. So no clear statement can be made of the success of advertisement on external platforms or with the own website.

> *"One employee already knew them, and we also knew about Homey [a product manufactured by GE] and who made them. We found that somehow over the internet." (Customer 2)*

However, awareness does not necessarily directly leads to interest. The customer requires further information before deciding first to visit the company in person or to buy. Different channels are used by GE to provide content, but one needs to know which channels are used by the consumer and at which point they prefer any online or personal information before buying. Trust and confidence account during this step as the main decision variable. One additional certification which can create trust to some extent is an ISO 13485 certificate, which demonstrates compliance with regulatory and legal requirements, in particular for the medical segment.

> *"You have built trust, and trust you do not build via a website which promises you everything. You just want to get to know the persons behind the website." (Customer 1)*

Customers can do the first part of the selection online, but before they become partners, personal contact is more important. Mostly the customers do not search online as they think they know every player in the market. However, when they do they look for electronics production, PCB production, EMS in a very broad sense or the capabilities.

> *"It is always difficult to get a good feeling about the capabilities, via a website. I always want to see it live. Maybe a make the first selection on the internet, but most of the time I will visit the potential new supplier." (Customer 3)*

If the interest of the customer is present, a decision has to be made, and evaluation of alternative producers is common. So for GE, it is valuable to know because of which criteria the customers chose for GE or if there were only problems with the previous supplier. Answers of the customers varied quite a lot ranging from the high quality to comparable low prices. All four also valued the enormous amount of flexibility within production, service, and delivery.

> *"We need someone to build the whole product and not just parts. They then also account for any problems when the product does not work as expected. The others could do that as well, but one was only able to do that in 2-3 month, there comes flexibility in again."(Customer 2)*

For some also close distance between manufacturing sides played a minor part as personal visits are valued highly to increase the prior mentioned aspects of trust and confidence in the capabilities of the manufacturing partner. Another customer especially valued their extra services and for being straightforward in the partnership, feedback, professional communication, and technology. So in the stage how does GE help customers to evaluate their value proposition? Provided content on the website can give a good overview of their service offerings and show that they can deliver the complete package from design to fulfillment. Aspects like quality, price, flexibility and personal communication more rely on offline channels and direct contact to communicate it in a trustworthy way. Further elaborating on services as an evaluation criterion the medical customers were asked to which extent they value certain services and capabilities offered by GE. As already mentioned production flexibility and the resulting fast prototyping is a critical part of the value propositions to all of the interviews customers. No matter where in design, detail or production phase quick, testable prototypes are a must for the customer. Nevertheless, flexibility is not solely about timing rather also about working routines.

> *"Concerning the flexibility is also about thinking with you and not only about time. Know how to act in certain situations/topics. Directly after we had an agreement, I set together with their production for the metal parts, and we discussed everything, and that is also flexibility, just hands on." (Customer 2)*

Additionally, the two smaller customers valued the smart sourcing capabilities, the active research on components and prices to receive a better view of the market. In contrast companies with own for this research are often in very close contact with all the component manufacturers. The customers also appreciate stock management. GE produces a certain batch and the customer orders in lower volume, while the rest of the batch is stored at GE. This method leads to immense cost savings with regards to purchasing the components all at once. Not directly a service but qualifications are the certificates, the mentioned ISO 13845 is not must for all customers, but this also strengthens the image of high-quality and trustworthiness because they have formatted their whole system according to the ISO standards.

> *"We expect that we will get more medical customers and if you also supply parts, then you need a production partner who has the medical certificate ISO 13485." (Customer 1)*

As mentioned by the Ministry of Foreign Affairs (CBI, 2016) personalization and customization of services play a major role this also applies to the current customers of GE. Their specialized equipment also requires additional testing facilities, which is also outsourced to GE, so they have an infrastructure for that, to make the adaptation and handle the new boards. However, also the customer also has to adapt to the working routines of GE when it comes to optimizing the business relationship.

> *"We also adapt to the production partner, so they specify what they would like from us. For most production partners it is the same. What we appreciate is, of course, the things we put into production. How could we improve the design that eventually the product gets better, cheaper, etc. That is something that GE does." (Customer 1)*

Once the product is delivered after sales services and evaluation to receive feedback for improvements is crucial to monitor and develop the value proposition. GE usually does two things when it comes to that

first After the products are delivered to the customer within one week they give them call to ask if there are satisfied, or if there is something else they can do for them. Number two is providing support, for maybe product failures that GE has to fix or questions from our customers regarding testing or any other production related issue. This contact is mostly via phone, email, and face-to-face. For another customer, they have regular contact with their production team after every batch. All in all a regularly monitored and sustainable business relationship is very important for customers of the medical segment.

> *"What I prefer to do when I start a contact I want to have a few times face to face contact, to determine whether it is a good contact, trustworthy, whether we can do business together for a long time, so sustainable. Sustainability is very important. When you are getting into the context of the project, so you have the contracts and set expectations, then the contact is mostly via phone and email." (Customer 4)*

Satisfaction can set the basis for loyalty if the product delivery is ensured. Providing additional incentives to buy is rather hard as most of the customers work on a project base, so the only incentive that GE have is to wait until a new project arrives. They have to try to keep in touch with the customer to know when the new project will come and just before the new project starts they have to try to convince them to work with GE again. GE also takes part in the active development of the product by offering a new component. They can co-develop or re-develop together with our customer which creates loyalty. This is an important aspect actively maintaining customer-supplier relationships and promoting coordination and collaboration, which we termed value network in theory. Also in the case of the medical segment, a close cooperation and a non-hierarchical relationship are preferred.

> *"It very much cooperation, because we actually outsourced a fundamental process of our company, so we established a sustainable cooperation. […] In MKBs (SMEs) it is very important to cooperate with each other, to combine the weapons, specialties to one organization, a virtual organization." (Customer 4)*

The relationships are commonly maintained via phone and e-mail as an ERP link to other production partners, or some electronic application where feedback can be provided is missing. Nevertheless, the personal cooperative part is essential to the customers. Interesting to see in the context of loyalty are the potential reasons why customers would switch to a different supplier. While for all four customer lack of quality would be the main reason, which is not expected in the future, the other factors are more intangible. One is searching for more specialized testing facilities so not only test equipment but rather test development, also with advice how to test it. Noticeable to say only one customer would switch when they demand higher volumes. The point that two customers outlined can be seen as somehow of a trend in setting expectations for future developments; those are crucial for a relationship.

> *"Therefore the main reason would be, not acting on agreements and appointment you have made. So-called "Laissez-faire" attitude, this is poison in a relationship." (Customer 2)*

Coming to the last part of the customer journey, advocacy is the overall goal every customer-supplier relationship should aim for. Every satisfied customer should spread his opinion and indirectly advertise for GE. They currently take an extra afford by introducing brand ambassadors. They are kept updated on

new services, so if GE has developed a new service and if it is implemented in the organization. They ask those ambassadors to promote this to companies within their network actively. This is a typical form of referral, which is also often known under the concept "word of mouth". Relating to the current customers in the medical segment the referral depends and is often limited due to the location and personal preference of their customer, as they have also developed a network. Others recommend GE to other colleagues or entrepreneurs in the market or use LinkedIn to share information about GE.

> *"Sometimes, the customer has already contact with a certain supplier, so we have to stick to that supplier. They want to produce locally like it is also the case of customers in Germany, they have their own EMS providers, to get the hands on the product and visit the facility." (Customer 3)*

Aside from the specific steps of the customer journeys, the new trends of digitalization and automation were checked for the medical segment and were more digital service, or entirely digital automated self-service is preferred. One customer simply wished for an extra notification, something changes in the lead time as it also influences the ordering time, but also giving notification to our customers. Similar to this proposal was their demand of another customer to have feedback once a month or every two months about what is in stock, what is called of the order and what is still open. Because when the product is out of stock, they have to order it 6-8 weeks before. Other suggestions range from a shared folder, which creates better information symmetry, to a complete library development, so that the EMS company will provide the customer with the schematics and the footprints for certain components and that also the price is attached to speed up the interaction. Once the journey has been identified the typical industry touchpoints are shown in figure 16.
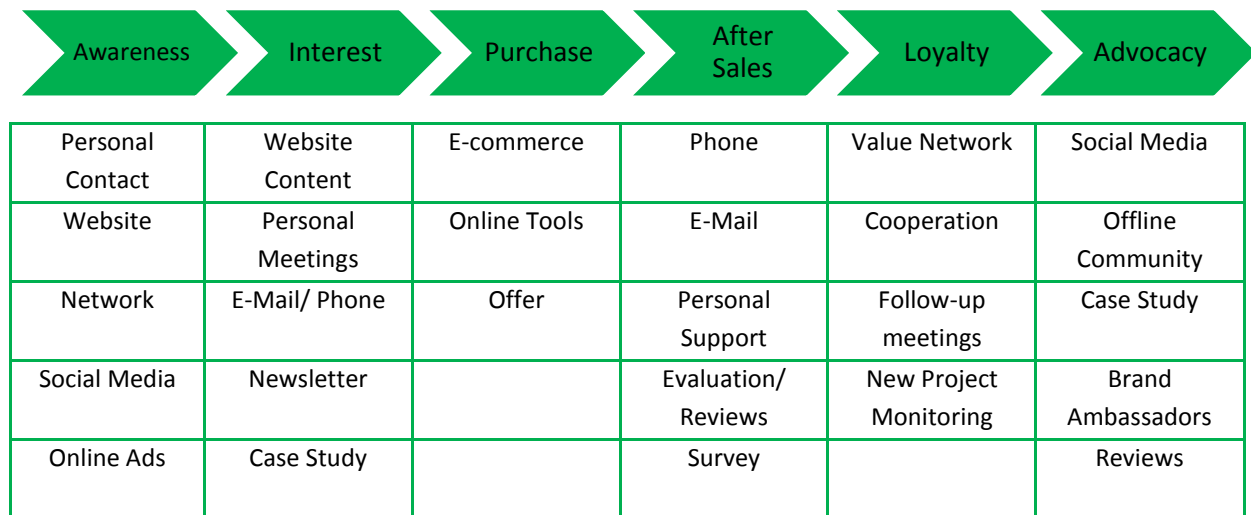
Awareness	Interest	Purchase	After Sales	Loyalty	Advocacy
Personal Contact	Website Content	E-commerce	Phone	Value Network	Social Media
Website	Personal Meetings	Online Tools	E-Mail	Cooperation	Offline Community
Network	E-Mail/ Phone	Offer	Personal Support	Follow-up meetings	Case Study
Social Media	Newsletter		Evaluation/ Reviews	New Project Monitoring	Brand Ambassadors
Online Ads	Case Study		Survey		Reviews

Figure 16: Touchpoints Medical Segment

Concluding to say about the medical segment, it looks broad at first sight, but when determining which subsegments are valuable to the case company and how they are targeted, it gets very specialized.
The journey of customers starts with getting aware by mostly personal contacts and networks, whereby social media and the corporate website play a minor part. As trust and confidence are very crucial in the next stage when evaluating the offers customer also prefer personal contact after a preselection was

made based on the competencies and capabilities listed online. This is also in line with risk reduction attitude which the highly specialized medical customers have, as their product is highly critical. When it comes to the purchase online tools can enable a smoother order process as offers can be processed quicker. After the acquisition, feedback mechanisms including phone calls, e-mail, and surveys ensure the satisfaction of the customer. If this is guaranteed loyalty is fostered by close cooperation and a follow-up meeting to discuss a new project, future development, and improvement points. An active referral is not very common in this segment, as it highly depends on the customers' business partners if they fit with GE services. If the information is spread they use social media or customers can become brand ambassadors which receive more detailed information from GE about their service offerings. Even though in overall customers were satisfied with the results, they mentioned some proposal how to increase the customer experience and cooperation between both parties.

5. Discussion, Implications, Limitations & Future Research Possibilities

In this chapter, the key results of the study by referring to research question are analyzed. The discussion sets the research into a broader picture as it stresses the practical as well as the theoretical implications, ending this thesis with the limitations and suggestion for future research areas and possibilities.

5.1. Discussion

The purpose of this study was to find an answer to the research question: *"How should a high-tech B2B organization create and communicate a unique value proposition for its targeted customer segment to match the business model with the customer journey?"* To answer this research question, the study was split into two parts the business side and the customer side, and for each side, several sub-questions were asked to identify critical elements in the business model and the customer journey. In the end, both tools should be combined to get a better overview how value is created, communicated and sustained for a certain customer segment. Supporting the view of Norton and Pine (2013) that in order to have a successful and tailored customer segmentation businesses need to align the customer journey and business strategy as the business model can be seen a reflection of the strategy (Casadesus-Masanell & Ricart, 2010; Teece, 2010). However, in practice, the business model and the customer journey seem far away from each other.

Coming to the business side and model in B2B context, in theory, two core functions were mentioned. First, the supportive role of strategic marketing to innovate processes, product, and services (Teece, 2010) and second to create and sustain competitive advantage by changing the terms of competition (Boons & Lüdeke-Freund, 2013; Chesbrough, 2010). When applying the BMC, this competitive advantage is not communicated in and externally among the stakeholders. Considering this misalignment, the first definition better represents the purpose of the tool. Innovative processes are here related to how to create, communicate and sustain the customer value proposition. After determining the company characteristics, strategy and competitive position in the market, the business model was set up focusing on the customer related building blocks. Starting from the point of segmentation the business model and in particular, the value proposition needs to have a specific focus on the targeted segment. It can be seen as an outside-in approach to create value as the company adapts to the needs of the customers.

The factor related to the offerings, how to build value, focusses on the initial configuration, but further, relies on the renewal of a unique proposition. Additional aspects including purchase use and transfer are in this context more facilitating a better customer experience by making the whole process more pleasant for the consumer (Osterwalder, 2004). Therefore flexibility in services is an important aspect of the value proposition which was truly appreciated by the customers and also seen as an essential part of the firm's capabilities. By following the outside-in approach of setting up the value proposition, the business not only can cope with the needs but more importantly integrated the expectations the customer also has for future developments, which provide a useful strategic orientation. The right channels and customer relationships provide the fundamental basis to target, create and communicate the value proposition.

The channel phases lead us to the concept of the customer journey and enable to integrate the consumer side in the interaction. The results and recent developments in the B2B area have shown that demand for multi channel usage for sales, marketing, and communication arises. Building pro-active cross-channel services delivered differentiated customer experiences that impact the awareness until loyalty. Associated digital transformation of customer services have changed the whole interaction with the customer and provided more opportunities to personalize the business offerings. With the resulting increased amount of complexity, consensus about the specific steps and phases was not to be found. Mapping those truly provided useful recommendation to identify at which point potential customer acquisition or retention is hindered and also where additional human resources are required. However, what also Norton and Pine (2013) criticize when applying this tool, business too often create and map customer journeys without any feedback from the customer. Only when this co-development and exchange is present, businesses can understand every key touchpoint in the contact that can lead to better resource allocation, cost savings but the most critical alignment of customer needs and expectation with the daily practices.

Zooming in on the matching the business model with the customer journey, the business model includes the customer segment and the value proposition, but when integrating the customer's perspective into the value creation, the customer journey can add deeper insights at which point of the value is maximized or still improvable. So how can the BMC then be improved?

The added value of this research for the field of the customer journey and business modeling in a B2B context is first of all the general applicability of both tools for a synergetic combination. Typical building blocks channel and relationships are not enough to stress out the importance at each stage of interaction and point within the business relationship. We need something more than that to better integrate the journey into the business model. First of all the in- and external interfere with the network needs to be clarified as they lead directly to the touchpoints during the customer journey. The formation of value networks needs to have a more central role in the business model as this network of activities is an essential part of the supplier-customer relationship and is only partially covered in the customer relationship block. Not only has the exchange of information, rather the access and sharing of new customers, knowledge, and data characterized the modern business relationships are crucial touchpoints after the purchase. Here the integration of the customer journey adds useful information, by focusing on co-creation of value and communities as preferred forms of the customer relationship, which stress out the new customer centric orientation and helps to create a unique value proposition. Referring to the

value proposition the results show that a business model is used to compare with competitors and to reach a competitive advantage. So it is suggested that this competitive advantage should be integrated into the model. The mentioned aspects of competitiveness by Osterwalder (2004): market share, channel complexity or the degree of networkedness are not enough to get the full picture of the market and create a unique value proposition.

An additional mentioned concept is the customer experience which new in the field of B2B relationships. The higher degree of complexity in comparison to B2C, based on higher involvement before and after the purchasing decision, creates a new approach of how to measure this along with the customer journey. Flexibility is seen as critical in value creation in B2B, to meet the needs of customers and customize the processes to their preferences, while still staying efficient. The resulting number of more offline touchpoints in B2B makes them less measurable aside from the awareness and interest via the website, which increasingly influences the perception of the buyer. Further customer experience is increasingly demanded in B2B markets due to digitalization. These trends have also been spotted in the context of this research. Respondents were increasingly seeking for automated digital services, which increase the speed of action, autonomy but also the transparency and exchange of information. Therefore this trend facilitates the coordination, collaboration, and co-development as a key source of innovation between the businesses partner, which at the end strengthen the need for a model which includes the value network. To also cope with the ongoing trend of globalization tailor made service offerings are required to differentiate on the broad market. New tools, interfaces, and community can lay the basis for an improved customer experience but only focus on the digital business model. The challenge for future practitioners and business is to match the online and offline channels and monitor experience at any time. If this experience is delivered more via channels or if internal and external platforms structures are a better fit remains to be studied for specific B2B settings. Mapping this customer experience along the customer journey becomes a challenge. The vast difficulty with the customer journey is the potentially high degree of complexity (more services > more stakeholder > more journeys > more touchpoints), especially in a B2B context the level of integration increases this, as external partners and service providers are also present.

So how can we now answer the research question: "How should a high-tech B2B organization create and communicate a unique value proposition for its targeted customer segment to match the business model with the customer journey"?

The business model is more the framework for the scope of interaction with the customer and lists all possible alternatives of how a value transfer can look like. In detail when tracking the customer journey of businesses are aware of the key moments in the interaction with the customer. In practice, if everyone is convinced of the meaningfulness of the project and the customer journey is a potent tool. While often tools like Balanced Scorecard focus internal rating, the customer journey is more of a view from the outside, and the customer is the focus. The measurement of specific interactions that can cause reactions or experiences to customers across different paths is crucial to optimize the businesses value proposition at any time. Considering all possible gaps or interruptions in customer interaction, like areas where customer data or processes cannot be maintained beyond touchpoints, leads to the development of critical objectives to be maintained and better monitored in the future. These recommended

opportunities enable a business to better meet customer needs, by also identifying the internal stakeholders who, through their activities, know-how and abilities can satisfy customer needs.

5.2. Practical & Theoretical Implication

Elaborating on the practical implication, this research is a case study of a Dutch SME EMS provider. The aim is not to find significant relations between the business model and the customer journey. Rather it explores how digital and physical touchpoints with consumers can be optimized to create a more pleasant customer journey, maximize the value by changing the way of communication. In practice, the findings imply different crucial aspects at the point of interaction.

As stated in the case introduction GE would like to redefine its marketing strategy and align their offers effectively to the demand of their targeted market segments. The overall goal of this strategy, namely awareness needs to be created, which is heavily relying on personal contact what the results of the medical segment show. Due to the limitation of this channel GE has to follow a new approach to identify new potential customer. Globalization and digitalization highlight that the future of awareness creation is the online channel. GE already has experienced this in the past month and responded with a new website, which they optimize with regards to Google AdWords and integrated tools that enable a better customer experience. The high-quality content provided, which is related to all areas of the production and services, leads to the interest and persuade the customer in his evaluation process to make contact. Especially for the medical segment this type of content is crucial to foster credibility aside from the required certificates in order to handle the medical market efficiently.

Technical wise, omnipresent "call to action" buttons are important to increase the conversion rate and lower the barrier of the first personal contact, which is highly valuable not only for this specific segment. This conversion is supported by quick offers processed by the sales persons. However, the customer journey does not stop with the purchase, the results have shown that in B2B co-creation is essential to develop the ongoing business relationship and successfully maintain it for the future.

Customers of the medical segment also desired digitally enabled services and fully digital automated self-service, which can help to improve the journey and can better align the customer's needs with the firm's technical capabilities. Everywhere in the journey feedback about automated tools, that increase the speed of action, autonomy, ease of use and enable co-creation (e.g. cloud based collaboration platforms or integrated databases) is beneficial as it implies a greater amount of flexibility for in and external processes. Furthermore, the feedback from the medical segment, concerning their value perception, can be used to search for similarities and synergies between customer journeys and can help to attract new markets more efficiently with the right collaboration of channels and customer relationships. Following an outside-in approach to value creation, potential segments can first be checked before trying to market them explicitly. Based on that segmentation these findings should further facilitate how they as a Dutch company can successfully enter other geographic markets with similar segment needs, taking the also the cultural differences into consideration which may impact needs and characteristics.

In theory, this case-study research provides an addition to the insufficient knowledge about the combination of business modeling and the customer journey, especially in a B2B context. As the literature study outlines a huge variety of definitions, functions, and elements of business models and

business model tools and how the customer journey is related to the concept. This research adds information on how to construct and communicate a unique value proposition by combining the two concepts. Nevertheless, both concepts are more a practical tool for practitioners to use instead of a causal theoretical explanation, which tries to explain a certain observation.

The BMC is a useful tool to define certain dimensions of the business model, while still lacking major aspects. First of all one need to add a "Competition or Competitive Strategy" building block like already proposed by Coes (2014). Commonly a business model is constructed to be able to compare the value proposition with competitors, but when integrating this block reflect the fit with the market and highlight potential misalignment, but also impact the other building blocks. In this research, the competitive environment was evaluated based on the Five Forces Model (Porter, 1980), which represents a comprehensive external market view. Additionally, when talking about the relationship between the BMC and the customer journey one could merge the blocks customer relationships and channels to a customer journey, as they are always interconnected. When integrating the journey as a major new block, the combination perfectly implies how to create a targeted value proportion. So these synergies between the BMC and the customer journey should be taken into account when developing a new business model tool. In addition, building on the concept of customer experience in a B2B context new business models should lay focus on the digital interaction and data exchange with the customer, because their role is expected to further increase in the future.

5.3. Limitations & Recommendations for Future Research

In this part, several limitations on generalizability, validity, and reliability are mentioned, and future research is proposed. Matching of the business model and customer journey in this study is limited to Dutch SME active in a high-tech B2B environment. For a sense of simplicity, this study is narrowed down to one specific segment and limited to existing customer of the case company, which only make out a small share of the whole medical segment. The explanatory cases study with semi-structured interviews was also selected due to the limiting time factor of ten weeks where the researcher stayed in the case company. A representative estimation of the modern customer journey is biased by personal contact, what was also found in the context of this research. Usually, in the awareness phase, personal contact plays an important role but is limited and therefore cannot be used to improve the customer's awareness actively, nevertheless channels like fairs, provide the possibility to make use of this awareness creation.

Regarding validity in this qualitative research, it describes the "appropriateness" of the tools, processes, and data (Leung, 2015). The assessment of business modeling and customer journey, whose definitions are not black and white, is hard to be validated. In contrast, the reliability of the study refers in quantitative research to the exact replicability of the processes and the results; consistency cannot be guaranteed even though a "margin of variability for results is tolerated" (Leung, 2015). As this study can only be seen as a snapshot of the current business model in a dynamic environment, also the customer's perception and preferences of e.g. channels or services may change in the near future.

All the prior mentioned aspects limit the generalizability of this study, as it is dependent on the boundaries of the research, which are defined by the context of the case study regarding values, time

and space (Bacharach, 1989). Since qualitative research studies and here an explorative case study is "used to study a specific issue or phenomenon in a certain population or ethnic group, of a focused locality in a particular context, generalizability […] is usually not an expected attribute" (Leung, 2015). These aspects limit the generalizability of the case studies, which also mitigated the value of this method. Nevertheless, to somehow increase the generalizability aspects of validity like the used data triangulation with web research, field research and interviews is applied. Small sample size limited to four interviews within the medical segment because of the existing customer base of the case company low external validity of the results. These interviews are based on open-ended questions and non-validated criteria, which endorses the exploratory aim of this research. All investigated variables are based on individual perception and therefore defined as subjective. This explorative nature provides much practical information, but statements about relationships and causalities cannot be made.

In future, the sample of segments can be increased to the generalizability of the findings and make more valid and reliable comparisons between the needs and touchpoints of their individual customer journeys. Cross-country and cross-cultural differences maybe also object of future study to estimate the fit between the same segments in different geographical markets. This new insight may provide more relevant strategic information to develop the presence on a foreign market further. Additional recommendations for future research are directed towards the B2B market, as it is constantly changing due to the mega trends of globalization and digitalization. Aspects of digitalization were only partly covered in the context of this research, but they may have an even bigger influence on the value creation and communication in future scenarios. With trends like industry 4.0, the changes for business models and customers journeys require further investigation. Customers are constantly asking for better customer experience also in the B2B environment may lead to completely new approaches to value creation and design of customer journeys.

6. References

Al-Arafati, A. (2016). Customer Relationship Management and Five Forces Analysis in Nonprofit Organization in Oman. *International Journal of Scientific and Research Publications, 6*(1), 436-440.

Al-Debei, M. M., Al-Lozi, E., & Fitzgerald, G. (2013). Engineering innovative mobile data services: Developing a model for value network analysis and design. *Business process management journal, 19*(2), 336-363.

Al-Debei, M. M., & Avison, D. (2010). Developing a unified framework of the business model concept. *European Journal of Information Systems, 19*(3), 359-376.

Al-Debei, M. M., El-Haddadeh, R., & Avison, D. (2008). Defining the business model in the new world of digital business. *School of Information Systems, Computing and Mathematics;*.

Amit, R., & Zott, C. (2001). Value creation in e-business. *Strategic management journal, 22*(6-7), 493-520.

Ansoff, H. I. (1965). Checklist for competitive and competence profiles. *Corporate strategy*, 98-99.

Armelini, G., & Villanueva, J. (2011). Adding social media to the marketing mix. *IESE insight, 9*, 29-36.

B2B Content Marketing (2015). Derived from http://contentmarketinginstitute.com/wp-content/uploads/2015/2009/2016_B2012B_Report_Final.pdf.

Bacharach, S. B. (1989). Organizational theories: Some criteria for evaluation. *Academy of management review, 14*(4), 496-515.

Balinas, T. (2017). Is Your Email Strategy Driving Your Referral Business? It Should. Derived from https://www.outboundengine.com/blog/using-email-marketing-to-increase-referral-business/.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of management, 17*(1), 99-120.

Baxter, L. A., & Babbie, E. R. (2003). *The basics of communication research*: Cengage Learning.

Belk, R., Fischer, E., & Kozinets, R. V. (2012). *Qualitative consumer and marketing research*: Sage.

Berman, S. J., & Bell, R. (2011). Digital transformation: Creating new business models where digital meets physical. *IBM Institute for Business Value*, 1-17.

Biggiero, L. (2006). Industrial and knowledge relocation strategies under the challenges of globalization and digitalization: the move of small and medium enterprises among territorial systems. *Entrepreneurship and Regional Development, 18*(6), 443-471.

Boons, F., & Lüdeke-Freund, F. (2013). Business models for sustainable innovation: state-of-the-art and steps towards a research agenda. *Journal of Cleaner Production, 45*, 9-19.

Canfield, D. d. S., & Basso, K. (2017). Integrating Satisfaction and Cultural Background in the Customer Journey: A Method Development and Test. *Journal of International Consumer Marketing, 29*(2), 104-117.

Casadesus-Masanell, R., & Ricart, J. E. (2010). From strategy to business models and onto tactics. *Long range planning, 43*(2), 195-215.

Cavalcante, S., Kesting, P., & Ulhøi, J. (2011). Business model dynamics and innovation:(re) establishing the missing linkages. *Management Decision, 49*(8), 1327-1342.

CBI, M. o. F. A. (2016). Through what channels can you get electronics and electrical engineering onto the European market? , Derived from: https://www.cbi.eu/market-information/electronics-electrical-engineering/channels-segments.

Chang, H.-L., Easley, R. F., & Shaw, M. J. (2003). A comparative study of exchange and aggregation models in the B2B e-marketplace. *Information Systems and E-Business Management, 1*(2), 213-228.

Chareonwongsak, K. (2002). Globalization and technology: how will they change society? *Technology in Society, 24*(3), 191-206.

Chen, I. J., & Popovich, K. (2003). Understanding customer relationship management (CRM) People, process and technology. *Business process management journal, 9*(5), 672-688.

Chesbrough, H. (2010). Business model innovation: opportunities and barriers. *Long range planning, 43*(2), 354-363.

Chesbrough, H., & Rosenbloom, R. S. (2002). The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. *Industrial and corporate change, 11*(3), 529-555.

Chung, K.-H., & Shin, J.-I. (2015). The Relationship between site characteristics, relationship quality, and word of mouth. *International Journal of Business and Information, 4*(2).

Claycomb, C., Iyer, K., & Germain, R. (2005). Predicting the level of B2B e-commerce in industrial organizations. *Industrial Marketing Management, 34*(3), 221-234.

Coes, B. (2014). Critically assessing the strength and limitations of the Business Model Canvas. *Master Thesis Business Administration. University of Twente*.

Collins, M. (2015). The pros and cons of globalization. *Forbes, http://www.forbes.com/sites/mikecollins/2015/05/06/the-pros-and-consof-globalization*.

Content Marketing Institute. (2014). What Is Content Marketing? , Derived from http://contentmarketinginstitute.com/what-is-content-marketing.

Court, D., Elzinga, D., Mulder, S., & Vetvik, O. J. (2009). The consumer decision journey. Retrieved from http://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/the-consumer-decision-journey.

Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*: Sage publications.

Dara, M. (2013). Value Network and Business Models Derived from http://essay.utwente.nl/63024/63021/Thesis_report_Maher_Dara_final.pdf.

De Baere, T. (2015). Organizing for the Digital Customer Journey, Derived from http://www.b2bmarketingexperiences.com/2015/08/organizing-for-the-digital-customer-journey/.

Deloitte. (2013). The digital transformation of customer services. Our point of view. Derived from https://www2.deloitte.com/content/dam/Deloitte/nl/Documents/technology/deloitte-nl-paper-digital-transformation-of-customer-services.pdf.

Ebert, C. (2006). Understanding the product life cycle: Four key requirements engineering techniques. *IEEE software, 23*(3), 19-25.

Edelman, D. C., & Singer, M. (2015). Competing on Customer Journeys. *Harvard Business Review*(November 2011).

El Sawy, O. A., & Pereira, F. (2013). Digital business models: review and synthesis. In *Business Modelling in the Dynamic Digital Space* (pp. 13-20): Springer.

Forrester Research. (2015a). Digital Transformation In The Age Of The Customer. Derived from https://www.accenture.com/_acnmedia/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Digital_2/Accenture-Digital-Transformation-In-The-Age-Of-The-Customer.pdf.

Forrester Research. (2015b). Mastering Omni-Channel B2B Customer Engagement. Derived from https://www.accenture.com/_acnmedia/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Digital_3/Accenture-Mastering-Omni-Channel-B2B-Customer-Engagement-Report.pdf

Füller, J., Mühlbacher, H., Matzler, K., & Jawecki, G. (2009). Consumer empowerment through internet-based co-creation. *Journal of Management Information Systems, 26*(3), 71-102.

Gentile, C., Spiller, N., & Noci, G. (2007). How to sustain the customer experience:: An overview of experience components that co-create value with the customer. *European Management Journal, 25*(5), 395-410.

Ghirvu, A. I. (2013). The AIDA model for advergames. *The USV Annals of Economics and Public Administration, 13*(1), 17.

Global Survey: B2B is the New B2C. (2013). Derived from https://www.avanade.com/~/media/asset/point-of-view/the-new-customer-journey-global-study.pdf.

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The qualitative report, 8*(4), 597-606.

Gummesson, E. (2008). Extending the service-dominant logic: from customer centricity to balanced centricity. *Journal of the Academy of Marketing Science, 36*(1), 15-17.

Gummesson, E., & Mele, C. (2010). Marketing as value co-creation through network interaction and resource integration. *Journal of Business Market Management, 4*(4), 181-198.

Hanelt, A., Piccinini, E., Gregory, R. W., Hildebrandt, B., & Kolbe, L. M. (2015). *Digital Transformation of Primarily Physical Industries-Exploring the Impact of Digital Trends on Business Models of Automobile Manufacturers.* Paper presented at the Wirtschaftsinformatik.

Haven, B. (2007). Marketing's new key metric: engagement. *Marketing*.

Health Holland Guide. (2016). Retrieved from: https://www.tfhc.nl/wp-content/uploads/2016/2007/HealthHolland-Guide-2015-2016.pdf.

Health Technology. (2016). Derived from: https://www.venturescanner.com/blog/2016/health-technology-q2011-update-in-2015-visuals.

Holland, H. (2014). *Digitales Dialogmarketing: Grundlagen, Strategien, Instrumente*: Springer-Verlag.

Hooper, T. (2017). The 7 Biggest Trends and Challenges in the Electronics Manufacturing Industry in 2017. Derived from https://www.pannam.com/blog/top-trends-and-challenges-in-electronics-manufacturing.

Jansen, B. J., & Schuster, S. (2011). Bidding on the buying funnel for sponsored search and keyword advertising. *Journal of Electronic Commerce Research, 12*(1), 1.

Järvinen, J., & Taiminen, H. (2016). Harnessing marketing automation for B2B content marketing. *Industrial Marketing Management, 54*, 164-175.

Kotler, P. (2000). Marketing management millenium edition. *Marketing Management, 23*(6), 188-193.

Kotler, P., Rackham, N., & Krishnaswamy, S. (2006). Ending the war between sales and marketing. *Harvard Business Review, 84*(7/8), 68.

Kraaijenbrink, J. (2012). Three shortcomings of the Business Model Canvas, Derived from http://kraaijenbrink.com/2012/07/shortcomings-of-the-business-model-canvas.

Kraemer, K. L., Gibbs, J., & Dedrick, J. (2005). Impacts of globalization on e-commerce use and firm performance: a cross-country investigation. *The Information Society, 21*(5), 323-340.

Krumeich, J., Burkhart, T., Werth, D., & Loos, P. (2012). Towards a component-based description of business models: a state-of-the-art analysis.

Lacey, R., & Morgan, R. M. (2008). Customer advocacy and the impact of B2B loyalty programs. *Journal of business & industrial marketing, 24*(1), 3-13.

Lancaster, G., & Withey, F. (2006). *Marketing fundamentals*: Routledge.

Leake, W., Vaccarello, L., & Ginty, M. (2012). *Complete B2B online marketing*: John Wiley & Sons.

Leidner, D. E. (2010). Globalization, culture, and information: Towards global knowledge transparency. *The Journal of Strategic Information Systems, 19*(2), 69-77.

Lembke, G. (2013). Trends im E-Commerce. Derived from http://bvmm.org/files/Trends_im_E-Commerce_2020_BVMM.pdf.

Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *Journal of marketing, 80*(6), 69-96.

Leung, L. (2015). Validity, reliability, and generalizability in qualitative research. *Journal of family medicine and primary care, 4*(3), 324.

Lusch, R. F., Vargo, S. L., & Tanniru, M. (2010). Service, value networks and learning. *Journal of the Academy of Marketing Science, 38*(1), 19-31.

Maechler, N., Poenaru, A., Rüdt von Collenberg, T., & Schulze, P. (2017). Finding the right digital balance in B2B customer experience, Derived from http://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/finding-the-right-digital-balance-in-b2b-customer-experience.

Maechler, N., Sahni, S., & Oostrum, v. (2016). Improving the business-to-business customer experience. Derived from http://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/improving-the-business-to-business-customer-experience.

Magretta, J. (2002). Why business models matter.

Manktelow, J., Eyre, E., Jackson, K., Cook, L., Edwards, S., Bishop, L., . . . Moss, I. (2017). Porter's Five Forces. Assessing the Balance of Power in a Business Situation. Derived from www.mindtools.com/pages/article/newTMC_08.htm.

Massa, L., & Tucci, C. L. (2013). Business model innovation. *The Oxford Handbook of Innovafion Management*, 420-441.

Mays, N., & Pope, C. (2000). Qualitative research in health care: Assessing quality in qualitative research. *BMJ: British Medical Journal, 320*(7226), 50.

Meyer, C., & Schwager, A. (2007). Understanding Customer Experience. *Harvard Business Review*, 1-11.

Ministry of Foreign Affairs. (2017). Through what channels can you get electronics and electrical engineering onto the European market?

Morgan, R. M., & Hunt, S. D. (1994). The commitment-trust theory of relationship marketing. *The journal of marketing*, 20-38.

Morris, M., Schindehutte, M., & Allen, J. (2005). The entrepreneur's business model: toward a unified perspective. *Journal of business research, 58*(6), 726-735.

Mutschler, B. (2017). Fachbegriffe einfach erklärt: Die Customer Journey. Derived from https://www.die-webseitenverbesserer.de/blog/fachbegriffe-einfach-erklaert-die-customer-journey.

Neuman Lawrence, W. (2014). Social Research Methods: Qualitative and Quantitative Approaches. *Pearson Education Limited*.

Nguyen, T. (2016). Customer Segmentation: A Guide to the best B2B Practices. Derived from http://labs.openviewpartners.com/customer-segmentation/#.WUVJxdxpzIU. Retrieved from http://labs.openviewpartners.com/customer-segmentation/#.WR78MdykLIV

Norton, D. W., & Pine, B. J. (2013). Using the customer journey to road test and refine the business model. *Strategy & Leadership, 41*(2), 12-17.

Osterwalder, A. (2004). The Business Model Ontology-a proposition in a design science approach.

Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: a handbook for visionaries, game changers, and challengers*: John Wiley & Sons.

Osterwalder, A., Pigneur, Y., & Tucci, C. L. (2005). Clarifying business models: Origins, present, and future of the concept. *Communications of the association for Information Systems, 16*(1), 1.

Patton, M. Q. (2002). Qualitative evaluation and research methods *Thousand Oaks, CA: Sage Publications, Inc*(3rd ed.).

Payne, A., Frow, P., & Eggert, A. (2017). The customer value proposition: evolution, development, and application in marketing. *Journal of the Academy of Marketing Science*, 1-23.

Peppers, D., & Rogers, M. (2016). *Managing Customer Experience and Relationships: A Strategic Framework*: John Wiley & Sons.

Porter, M. E. (1980). Competitive startegy: Technigues for analyzing industies and competitors.

Porter, M. E. (1985). Competitive advantage: creating and sustaining superior performance. 1985. *New York: FreePress*.

Porter, M. E. (2008). The five competitive forces that shape strategy. *Harvard Business Review, 86*(1), 25-40.

Ramos, L. (2015). Advocate Marketing Creates B2B Customer. Relationships That Last A Lifetime. *Forrester*, Derived from http://info.influitive.com/rs/879-TZW-526/images/Forrester-Research-report-Advocate-Marketing.pdf.

Rauyruen, P., & Miller, K. E. (2007). Relationship quality as a predictor of B2B customer loyalty. *Journal of business research, 60*(1), 21-31.

Richardson, A. (2010). Using customer journey maps to improve customer experience. *Harvard Business Review, 15*(1).

Rosenbloom, B. (2007). Multi-channel strategy in business-to-business markets: Prospects and problems. *Industrial Marketing Management, 36*(1), 4-9.

Scholten, R. (2016). Digital Platform Canvas: designing platform business models. Derived from http://icsb.nl/artikelen/new-business-model-canvas-for-digital-platforms/.

Schüller, A. M. (2012). *Touchpoints: auf Tuchfühlung mit dem Kunden von heute; Managementstrategien für unsere neue Businesswelt*: GABAL Verlag GmbH.

Seppänen, M., & Laukkanen, I. (2015). *Business model innovation: Focus on customer experience.* Paper presented at the Engineering, Technology and Innovation/International Technology Management Conference (ICE/ITMC), 2015 IEEE International Conference on.

Setia, P., Venkatesh, V., & Joglekar, S. (2013). Leveraging digital technologies: How information quality leads to localized capabilities and customer service performance. *Mis Quarterly, 37*(2), 565-590.

Shafer, S. M., Smith, H. J., & Linder, J. C. (2005). The power of business models. *Business horizons, 48*(3), 199-207.

Stuckey, H. L. (2013). Three types of interviews: Qualitative research methods in social health. *Journal of Social Health and Diabetes, 1*(2), 56.

Teece, D. J. (2010). Business models, business strategy and innovation. *Long range planning, 43*(2), 172-194.

Timmers, P. (1998). Business models for electronic markets. *Electronic markets, 8*(2), 3-8.

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British journal of management, 14*(3), 207-222.

Trends Shaping the Future of Electronics Manufacturing Facilities Management. (2017). Derived from https://www.humidity.com/m/0/5-trends-in-electronics-facility-mgmt-white-paper.pdf.

Value Network. (2017). Derived from http://bmtoolbox.net/tools/value-network/.

van Aken, J., Berends, H., & Van der Bij, H. (2012). *Problem solving in organizations: A methodological handbook for business and management students*: Cambridge University Press.

Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of marketing, 68*(1), 1-17.

Wedel, M., & Kamakura, W. A. (2012). *Market segmentation: Conceptual and methodological foundations* (Vol. 8): Springer Science & Business Media.

Weill, P., & Woerner, S. L. (2013). Optimizing your digital business model. *MIT Sloan Management Review, 54*(3), 71.

White, J. (2017). Need to Scale Faster? Align Your Sales and Marketing Teams. Derived from https://www.inc.com/john-white/need-to-scale-faster-align-your-sales-and-marketing-teams.html.

White, R. L. (2017). How the Marketing Funnel Works From Top to Bottom, Derived from https://trackmaven.com/blog/marketing-funnel-2.

Wirtz, B. W. (2011). Business model management. *Design–Instrumente–Erfolgsfaktoren von Geschäftsmodellen, 2*.

Wolfswinkel, J. F., Furtmueller, E., & Wilderom, C. P. (2013). Using grounded theory as a method for rigorously reviewing literature. *European Journal of Information Systems, 22*(1), 45-55.

Yin, R. K. (2013). *Case study research: Design and methods*: Sage publications.

Zeidler, S. (2010). Mit Customer-Journey-Mapping die Kundenzufriedenheit steigern. Derived from https://www.gruenderszene.de/allgemein/mit-customer-journey-mapping-die-kundenzufriedenheit-steigern.

Zhao, X., Huo, B., Flynn, B. B., & Yeung, J. H. Y. (2008). The impact of power and relationship commitment on the integration between manufacturers and customers in a supply chain. *Journal of Operations Management, 26*(3), 368-388.

Zomerdijk, L. G., & Voss, C. A. (2010). Service design for experience-centric services. *Journal of Service Research, 13*(1), 67-82.

Zott, C., & Amit, R. (2009). *The Network Challenge (Chapter 15): The Business Model as the Engine of Network-Based Strategies*: Pearson Education.

Zott, C., Amit, R., & Massa, L. (2011). The business model: recent developments and future research. *Journal of management, 37*(4), 1019-1042.

Попенкова, Д. (2016). B2B COMMERCE UNDER THE PROCESS OF REFORMATION. *СОВРЕМЕННЫЕ ТЕНДЕНЦИИ РАЗВИТИЯ НАУКИ И ТЕХНОЛОГИЙ*, 92.

7. Appendix

**Appendix 1: Business Model Concept (Wirtz, 2011)**

	Business Informatics	Management Theory	
	Information technology oriented	**Organization theory oriented**	**Strategy oriented**
Development:	• Phase I (1975-1995): business modeling for system construction • Phase II (since 1995): e-business	• Management as Science: Taylor (1911), Gilbreth (1911), Fayol (1916) • Various organization schools (e.g. contingency theory, transaction cost theory) • The structuring of organizations: Mintzberg (1979)	• Innovation: Schumpeter (1934) • Strategy and Structure: Chandler (1962), Ansoff (1965) • Resource-based-view: Penrose (1951), Barney (1986) • Market-based-view: Porter (1971)
Establishment as basic approach of the business model concept:	• Since 1975 • Development parallel to the business model term	• Since 1995 • Structure detached from IT • Business structure/ Business plan/Business architecture	• Since 2000 • Strategic business structuring • Business model innovation • Value creation
Important authors:	• Timmers (1998) • Wirtz (2000) • Afuah/Tucci (2003)	• Linder/Cantrell (2000) • Keen/Qureshi (2005) • Tikkanen/Lamberg (2005)	• Hamel (2000, 2001) • Chesbrough/Rosenbloom (2002) • Zott/Amit (2008)

Business model concept

Appendix 2: Strength and Limitations of the Business Model Canvas (Coes, 2014)

Strengths:	Limitations:
The construct around the Value Proposition is good with one remark. Which is mentioned in the limitations column.	Limitations regarding the Value Proposition is that it does not include Social Value. Therefore, non-profit and governmental organizations cannot be captured in the Business Model Canvas.
The visual representation of the Business Model Canvas is good. Consensus is recognized between the interviewees. This strength results in a lot of possibilities in using the tool from different perspectives and different starting points. This makes the tool easy to operate.	Overlap and intertwine of the building blocks Customer Relationships and Channels, and the overlap of Key Activities and Key Resources. This leads to confusion or not using one of the building blocks.
Overall the interviewees agreed on the benefit of the Business Model Canvas on the communicability of a proposed Business Model.	The lack of room in the building blocks Cost Structure and Revenue Streams for proper financial calculations. Also, the time element is missing.
The way of using the Business Model Canvas is easy to understand, however there are some remarks on individual building blocks. These are mentioned in the left side of this table.	Competitiveness is missing in the Business Model Canvas. For example, several interviewees mentioned a missing building block comparable with a Competitive Strategy building block which takes into account external factors such as risk, competition, market influence and other environmental forces.
In terms of creativity, a strength which can be attributed to the tool is the structural effect on the creative thoughts. This result in a clearer view which then can be communicated easier and alignment during the process can be established.	The Business Model Canvas in itself is not beneficial for creativity, because the designers of a business model are forced to think in the nine building blocks.
	The Business Model Canvas does not provide structure or motivation to administer sources, assumptions and decisions. This results in a low controllability of design decisions afterwards.

Table 43: Strengths and limitations based on the Business Model Canvas

Appendix 3: Digital Platform Canvas (Scholten, 2016)
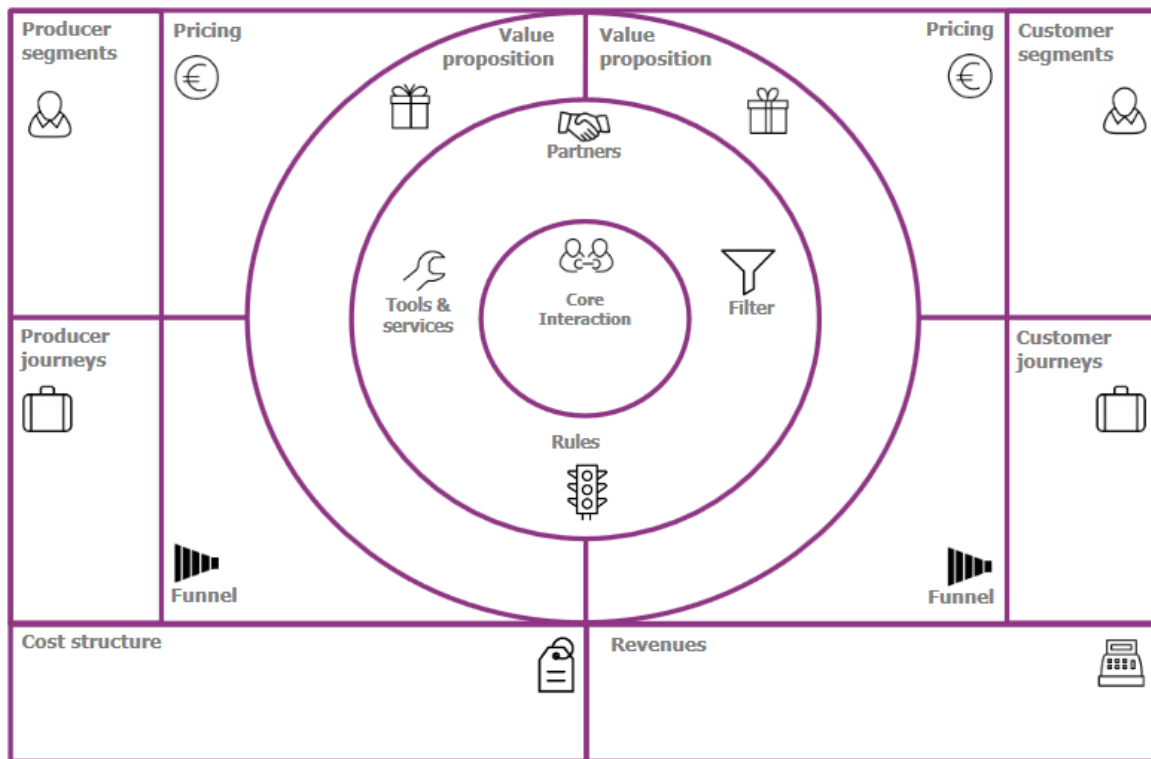
Appendix 4: Interview Questions Employees

Business Model Canvas

1. What is the Value Proposition that makes GE unique within the industry?
    a. How do we create superior value for the customer?
2. How would you describe the perfect customer for GE? (Size of order, frequency, duration)
3. Is there a Customer Segmentation in place (industries, types of organizations, size) GE is targeting for?
    a. Are there some key differences between the segments
4. What Channels would you see most relevant for GE marketing operations?
    a. How does GE create awareness about the company's services?
    b. How are the channels integrated in the customer relationship routines?
    c. Which channel work best, most cost-efficient?
5. Is there a typical of customer relationship in place for certain segments?
    a. Customer service (personal, self-service, automated)
    b. Communities for exchange?
    c. Co-creation by customers actively modify the offerings (trends)
6. Which form of network with suppliers and partners is in place?
    a. Mutual beneficial
    b. Forms of collaboration, exchange, co-produce, co-create?
    c. Do you share access to markets, reputation?
    d. Referrals and word of mouth within the network

Sales Funnel:

7. By looking the sales funnel, does GE have an existing sales process that covers these stages and what are the different methods and objectives for the sales funnel stages?
8. Looking at the model presented what would you see as the main blockage points in GE sales funnel?
9. Which form of advertisement does GE commit
   a. Online ads, radio, TV, print?
   b. Which form of content/information does GE provide? (Social Media, Case Studies, Blogs, Newsletters, Events, Videos/ Photos, Seminars or Webinars)
10. What are the services after the sales/purchase to engage loyalty?
    a. Or only based on contracts?
11. Do we have any form of loyalty program in place,
    a. Provide incentives to buy?
    b. Support advocacy in communities
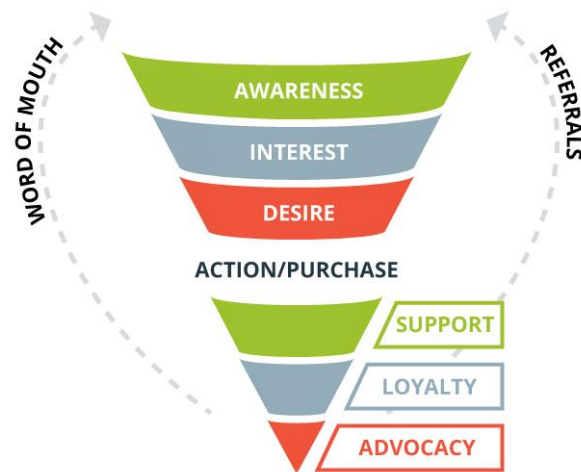
Five Forces:

Threat of new entrant

12. What's the threat of new businesses starting in this sector?
13. Are there barriers to entry which give you greater power?
    a. Rules and regulations?

Buyer Power

14. How powerful are the buyers? Can the buyers get costs down?
15. On what factors does the bargaining power of buyers mostly depend?
    a. Order size, loyalty, or there fixed margins per volume and service?

Threat of Substitution

16. How does GE protect themselves from substitution by other suppliers?
    a. Easy to find an alternative, outsourced or automated?

Supplier Power

17. Examine how many suppliers are in the market?
18. Are there a few who control prices and hold the power?
19. How easy is it to switch, what's the cost?

Competitive Rivalry

20. What's the level of competition in this sector?
21. What's the competitor situation? Many competitors and you're all in a commodity situation or a few?

Appendix 5: Interview Questions Customer Medical Segment

Image and Capabilities

What values/things related to our image, what do we stand for?

What capabilities, what do you think we are good at?

Sales/Marketing Funnel:

Awareness

1. How did you get aware of about Global Electronics? Who made the contact?
   (Own research/ marketing/ personal contact/ advertisement?)

Interest

2. Where did you search for information about Global Electronics before visiting/buying?
   (Internet, colleagues, referrals, press, social media, events, seminars)?
   a) Do you prefer any online or personal information before buying? (Trust & Confidence before personal contact?)
   b) If google/online which search terms did you look for?

Intent/Decision / Evaluation (Services offerings & justification)

3. Did you search for alternative producers?
   a) Because of which criteria did you choose for Global Electronics?
   b) Was there any problem with the prior supplier/ before Global Electronics?
   c) Personalization/ Customization of services play an important role?

Support

4. Was there any post-purchase evaluation of services or possible improvements in place
   (Review or Call)?

Loyalty (Commitment/Trust/ Satisfaction)

5. Where you satisfied with the results/ product? (order tracking & logistics also?)
   a) Can you think of any incentives to buy again/ faster?

6. How important do you find actively maintaining a customer-supplier relationship?
   a) Is there a form of contact you prefer (e-mail, phone, personal contact) e.g. for new information about GE

7. Which form of coordination and collaboration do you prefer with your suppliers? (Value Network)
   b) Cooperation, development of product OR strict differentiation customer/ supplier (hierarchical)

Referral (Word of Mouth) & Advocacy

8. Do you recommend Global Electronics to others partners? (business referrals)
9. Do you talk about GE in your online presence or the communities you belong to?

Extra Question:

Could you image 2 reasons why you most likely would switch to a new supplier?
   a) Higher Volumes, no contact no improvements in a long time (stagnation), or other reasons?

Overall, how do you value our specific services?
10. Is fast prototyping, a flexible product line & fast delivery relevant for your business?
    a) So you be willing to pay higher prices for faster deliveries?
11. How do you value our "Smart Sourcing" capabilities, which can lead to proactive product improvements with new components on the market?
12. How do you value certificates and international standard for considering the supplier?
13. How do you value full traceability of all product components?
14. How do you value that we can place the full range of components?
15. How do you value our possibilities that we offer stock management if required?
    a) To reduce cost, we produce in larger volumes/batches and you can call of anytime the number of product you want (lower price for components)

Digitalization/ Automation:
16. Where do you would like to have more human interaction or digital fully automated self-service?
    a) Automated self-service/tooling interesting for future order to increase the speed of actions and your autonomy?
    b) Where do you need help during the product development phase?
    c) Online DFM check valuable?
    d) Online PCB Configurator useful, to estimate the price?
    e) Online Offer/ Reorder valuable?
17. Do you miss any capabilities, service or anything during the contact with GE?

Appendix 6: Business Model Canvas Blocks: Key Resources/Activities/Partnerships, Revenue Streams & Cost Structure

To cover all blocks of the business model the remaining five blocks are quickly described as they impact the studied blocks and cannot be seen independently.

Key resources are defined as the "most important assets required to make a business model work"(Osterwalder & Pigneur, 2010). Relating to the Resource-based View of creating sustained competitive advantage contributed to by Barney (1991), these resources further include capabilities, organizational processes, firm attributes, information and knowledge. Osterwalder and Pigneur (2010) use a four type description:

Resource Type	Specification
• Physical	Tangible assets, equipment and machinery
• Financial	Credit, cash and stock options
• Human	People
• Intellectual	Patents, trademarks, copyrights, partnerships and customer database

Besides the resource type also the ownership can vary, as the resources can be owned or leased by the company or acquired from key partners.

Closely aligned with this building block are the key activities, as the resources solely do not create value for the customer. Those are the "most important things a company must do to make its business model work"(Osterwalder & Pigneur, 2010). Activities of companies to create value are production, problem-

solving and platform/network activities. Those key activities listed in the BMC are only the most important that determine the competitive advantage and not all the activities that are part of the business (Osterwalder & Pigneur, 2010).

The ability of a business to respond to different needs, internal and external, which are not included within its own business model, is enabled by its key partner. Networking with suppliers and partners is an important element of the business model. The selection of the right partner to form different partnerships has three major effects. First, it can help to reduce costs due to economies of scale when production is outsourced or architectural infrastructure is shared. Second, reduce risk and uncertainty as shortages can be covered and the creation of customer value planned together. Third, acquisition can enable access to external resources of all kind, to share technologies, knowledge, licenses or access to different customer segments. Different types of partnerships can range from strategic alliances with non-competitors, strategic partnerships between competitors, joint ventures to normal buyer-supplier relationships assure reliable supplies (Osterwalder, 2004).

These three key blocks will determine the cost structure of the business. This cost structure describes "all costs incurred to operate a business model" (Osterwalder & Pigneur, 2010). As the building blocks key resources, key activities, key partner, customer relationships and channel mostly do not provide any revenues, costs are accounted to deliver the value to the customer. These costs are summarized in the cost structure. Configurations of the business model distinguish between cost-driven and value-driven based on the general strategic orientation of the business. While the first focuses minimizing the costs of the product or service as much as possible the second is more concerned with maximizing the value of the product or service itself via R&D, innovation, customization and constant improvements. Furthermore, costs can be seen as fixed costs or variable costs. This distinction is very crucial when analyzing the economies of scale and growth potential, as some production factors remain the same regardless of the volume of the goods or services produced (Osterwalder & Pigneur, 2010; Osterwalder et al., 2005).

As the last building block of the BMC, the revenue streams "represents the cash a company generates from each customer segment" (Osterwalder & Pigneur, 2010). Whereby, profit can be calculated by subtracting costs from revenue. Osterwalder and Pigneur (2010) differentiate between two types revenue streams, one time purchases and continuous revenues, which result from "ongoing payments to either deliver a value proposition to customers or provide post-purchase customer support". For both possibilities, the right pricing mechanism must be chosen in order to generate the most revenue. The mechanism could be either fixed, including prices based on set variables, or dynamic pricing, where prices are based on market conditions. Conclusively a business model can only be sustainable if the revenues are higher than costs (Osterwalder & Pigneur, 2010).

Appendix 7: Business Model Canvas Electronics in English and Dutch (2016)

Key Partners:	Key Activities:	Value Proposition:	Customer Relationships:	Customer Segments:
• Engineer Companies • Branch organizations • Temporary employment agency • Component Supplier	• Design for manufacturing /assembly • Soldering • Testing • Assessing data • Redesign • Box build **Key Resources:** • Machine Park • Knowledge • In / online communication	• Flexible Production Line • Smart Sourcing • IP Trust • Fast Prototyping • TQM • High Quality • Full Traceability • Box Build • Startup Support	• Co-creation • Cooperation • Personal Assistance • Communities **Channels:** • Website • Social media • Online Ads • Fairs • Networks	• Security • Defense • Industrial • Medical • LED • Startup • Robotics • Internet of Things

Cost Structure:	Revenue Streams:
• Salary • Operating costs • Facilities / Depreciation • Marketing	• Assembly • Commercial products • Services • Lending

Partners	Kern-activiteiten	Waarde propositie	Klant relaties	Klant-segmenten
- engineer bedrijven (bijv. 3T) - branche organisaties - uitwisselen personeel (detacherings-bureaus)	- data beoordelen - design for manufacturing (dfm) - assemblage - testen **Bedrijfsmiddelen** - machinepark - kennis - in/online communicatie	- Inkoop - Assemblage* - Testen - Redesign - Box build - Dfm/industriali-sering - personeel (detachering) *Bestücken AOI Handmontage	- leverbetrouw-baarheid - prijs/ kwaliteit - flexibel - aanverwante services **Kanalen** - klant naar klant - site/ soc.media - online strategie - beurs (bezoek) - netwerken (FHI)	- security - defensie - industriële app - medische app - bedienings-panelen (Electro)

Kosten		Omzetstromen
- Salaris - Huisvesting - Marketing	- Exploitatie - Afschrijving	- Assemblage - Handelsproducten - Services - Uitleen

Appendix 8: Global Electronics Mission and Vision (translated English version, not official)

Mission: Global Electronics wil op basis van maatschappelijk verantwoord ondernemen haar kennis en kunde inzetten om kwalitatief hoogwaardige producten te leveren aan haar klanten. Door gedurende het hele traject mee te denken en haar kennis in te zetten creëert Global Electronics een duurzame meerwaarde voor haar klanten. Het constant innoveren in productietechnieken en- processen en daarbij mens en milieu in acht nemend, zorgt dat Global Electronics de standaard zet als het gaat om elektronicaproductie in de 21e eeuw.

Global Electronics is based on CSR to use our knowledge and skills to deliver high quality products to our customers. By thinking throughout the process and to use our knowledge Global Electronics creates sustainable added value for its customers. The constant innovation in manufacturing techniques and processes taking into account people and the environment taking, allows Global Electronics sets the standard when it comes to electronics manufacturing in the 21st century.

Vision: De maak-industrie verandert razendsnel. De vraag naar een breed dienstenpakket neemt toe, de grotere spelers kiezen steeds vaker voor het uitbesteden van niet-kernactiviteiten. Marges en time to market staan onder druk en seriegroottes laten een dalende trend zien. De diversiteit aan producten neemt toe dankzij innovaties en nieuwe ontwikkelingen. De vraag naar kwalitatief hoogstaande (Europese) producten neemt toe en de aandacht voor mens en milieu speelt een steeds grotere rol. LED-applicaties zijn een goed voorbeeld van deze ontwikkelingen. Global Electronics gaat mee in deze veranderingen door haar dienstenpakket uit te breiden, zich te conformeren aan de stijgende kwaliteitseisen en te investeren en innoveren in productietechnieken die mens, milieu en hoge kwaliteit als kernwaardes hebben.

The manufacturing industry is changing rapidly. The demand for a wide range of services increases, the larger players are increasingly choosing to outsource non-core activities. Margins and time to market pressure and batch sizes show a downward trend. The diversity of products increases due to innovations and new developments. The demand for quality (European) products increases and the focus on people and the environment is playing an increasingly important role. LED applications are a good example of these developments. Global Electronics go along with these changes by expanding its range of services to comply with the increasing quality requirements and to invest and innovate in production techniques, the employees, environment and quality are the core values.

Appendix 9: Classification Medical Segment ("Health Technology," 2016)

IoT Health Care: Internet of Things (IoT) focused on consumer and/or at-home health care solutions. Examples include devices that measure and track health vitals.

IoT Fitness: Internet of Things (IoT) focused on personal fitness and wellness solutions. Examples include wearables that track fitness stats, monitor heart rate, and sports-specific data collection solutions.

Digital Medical Devices & Diagnostics: IT-enabled medical devices and diagnostic tools for use by doctors and other clinical staff. Examples include tools for use in surgery, monitoring equipment, and detection equipment.

Electronic Health/Medical Records: Services that create and manage EHR/EMR to improve efficiency and effectiveness of medical practices. Examples include platforms that provide electronic medical charts, schedules, prescription tracking.

Healthcare Mobile Communications/Messaging: Mobile communications services dedicated for hospital use by doctors, nurses, and other medical professionals. Examples include secure messaging for doctors and shareable notes amongst professionals.

Healthcare Robotics: Companies that create robotics solutions for healthcare. Examples include companies that create robotic prosthetics and robotics solutions for remote patient treatment.

TeleHealth: Services that allow remote treatment and/or consultation between doctors and patients. Examples include solutions that allow patients to video conference their healthcare professionals and/or text/SMS/email for treatment.

Remote Monitoring and Family Care Management: Services that allow families and medical professionals to monitor and manage those in care. Examples include services that provide caregivers to senior citizens as well as alert systems for in-home care.

Gamification of Health: Application of game elements to promote behavior-changing health and wellness. Examples include gamification solutions for healthy eating and fitness.