Multiple Perspectives on Product-Service Transition and Its Influence on Business Model Design in Manufacturing Firms

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Abstract

Business practice shows that manufacturing firms recently strive for securing and enhancing their competitive position by overcoming their traditional product-centric way of acting and employing a service-related strategy. This product-service transition provides benefits for manufacturing firms such as differentiation opportunities, a new source of revenues, as well as the option to create a better fit to changed customer behavior. However, many manufacturing firms are not able to benefit from a service-related strategy as they fail to establish a business model that supports product-service transition and therefore experience difficulties in operationalizing such a strategy. However, research has by now not paid sufficient attention to the identification of business models that support product-service transition and to the change process that comes along with implementing a new business model. Moreover, research on product-service transition usually focuses on various service-related aspects and analyzes them in isolation. Such a decoupled analysis does not foster a holistic understanding how manufacturing firms can benefit from service-related strategies. By employing the business model as a new unit of analysis and using qualitative-empirical research, this thesis (1) overcomes the narrow, unidimensional focus on product-service transition as it provides evidence that manufacturing firms employ different service strategies that are reflected in different distinct business model configurations in order to pursue product-service transition; (2) analyzes business model change processes in established manufacturing firms in detail and shows that business model change in the context of product-service transition is very often an incremental and emergent process; (3) highlights antecedents that influence a manufacturing firm's business model design choice as well as barriers that decelerate the business model change process in the context of product-service transition.

Keywords: Product-service transition; business models; business model change; manufacturing industry.

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Firms need to develop and pursue strategies that match environmental contingencies – a fact that is stressed by strategy and organizational theory literature (e.g. Ginsberg and Venkatraman, 1985; Drazin and Van de Ven, 1985; Yamakawa, Yang, and Lin, 2011; Zajac, Kraatz, and Bresser, 2000). Following, firms have to adjust their strategies if ecosystem conditions are subject to changes.

Especially in the past few years, relevant ecosystem changes take place that affect various industries (Bradley, Aldrich, Shepherd, and Wiklund, 2011; Meyer, Brooks, and Goes, 1990). In this context, two major trends – advancements in information and communication technology as well as the deregulation of markets – affect value creation opportunities in a considerable way (Casadesus-Masanell and Zhou, 2013; DaSilva and Trkman, 2014; Prahalad and Ramaswamy, 2002; Teece, 2010). The availability of improved information and communication technology causes a change in the role customers play in value creation processes as it allows for better and faster access to information. This technological change enables customers to gather information about firm offerings on a worldwide basis and to compare offerings and prices (Prahalad and Ramaswamy, 2004; Teece, 2010). Moreover, customers are also able to share information about firms and their offerings with other customers in customer communities by making use of new information and communication technology (Prahalad and Ramaswamy, 2002). The enhanced transparency and comparability of offerings not only increases customer power in price negotiations (Prahalad and Ramaswamy, 2004; Teece, 2010), but also affects customer desires and expectations as the awareness of possible choices increases (Prahalad and Ramaswamy, 2002). As customers become more aware of their needs and existing possibilities that may fulfill their needs, they very often demand highly complex solutions (Jaakkola and Hakanen, 2013). Consequently, firms need to adjust to changes in customer behavior. On the other hand, the deregulation of markets and the establishment of open global trading regimes lead to changes in the competitive landscape as new competitors enter the market and competition shifts to an international level (Hitt, Hoskisson, and Kim, 1997; Teece, 2010). Due to the rising number of competitors that enter the market with similar offerings, it becomes considerably difficult for firms to differentiate themselves from their competitors. This fosters – in conjunction with

enhanced comparability and transparency of offerings – price competition (Prahalad and Ramaswamy, 2003; Teece, 2010).

Dealing with the consequences of these changes is especially challenging for manufacturing firms as they very often operate in mature markets. Thereby it is important that the differentiation potential of products rapidly decreases in mature markets (Oliva and Kallenberg, 2003; Kowalkowski, Kindström, Alejandro, Brege, and Biggemann, 2012). At the same time, cost-based competition becomes increasingly difficult as ways to further reduce costs are often already depleted (Prahalad and Ramaswamy, 2003). Additionally, the product-centric, supply-side logic of the industrial era that is still prevalent in many manufacturing firms does not comply with changed customer behavior and new customer needs (Prahalad and Ramaswamy, 2003; Wise and Baumgartner, 1999).

To overcome the negative effects of ecosystem changes, literature suggests that manufacturing firms should move toward the customer's end of the value chain (Wise and Baumgartner, 1999) in order to create solutions that are of high value for the customer (Foote, Galbraith, Hope, and Miller, 2001). Manufacturing firms can tap into the high growth potential of service-related offerings (Sawhney, Balasurbramanian, and Krishnan, 2004; Wise and Baumgartner, 1999) by rethinking product-centric strategies and developing a new type of strategy that encompasses a distinct focus on service (Galbraith, 2002; Gebauer, Fleisch, and Friedli, 2005; Oliva and Kallenberg, 2003; Penttinen and Palmer, 2007). Neely (2008: 107) defines this product-service transition (which he calls servitization) as a process that *"…involves the innovation of an organization's capabilities and processes so that it can better create mutual value through a shift from selling products to selling Product-Service Systems"*. However, it is still common that researchers do not clearly define product-service transition when studying this phenomenon. They very often rather address service-related strategies or service-related offerings of manufacturing firms without explicitly making use of the term "product-service transition".

Literature provides valuable insights on benefits of product-service transition. In detail, the following benefits are explicitly mentioned: First, manufacturing firms can utilize service-related strategies to differentiate themselves from competitors (Gebauer et al., 2005; Oliva and Kallenberg, 2003). Competitors cannot duplicate another firm's service offerings as easily as product offerings because service offerings are compared to product offerings usually more knowledge intensive (Fang, Palmatier, and Steenkamp, 2008) and more labor

dependent (i.e. service offerings are usually provided in direct interaction between customers and a firm's employees) (Gebauer and Friedli, 2005; Oliva and Kallenberg). Therefore, by employing a strategy that focuses on integrating service offerings into the portfolio of offerings manufacturing firms are able to make their overall portfolio of offerings unique and more valuable to customers, which in turn leads to an improvement of their competitive position (Anderson and Narus, 1995; Fang et al., 2008; Gebauer et al., 2005).

Second, literature (e.g. Gebauer et al., 2005; Oliva and Kallenberg, 2003; Wise and Baumgartner, 1999) emphasizes that service-related strategies allow manufacturing firms to tap a new source of revenues. Furthermore, service offerings have higher profit margins than product offerings (Oliva and Kallenberg, 2003; Ren and Gregory, 2007). Due to the intangible nature of service offerings transparency and comparability of offerings decreases and thus manufacturing firms can enforce higher prices (Antioco, Moenaert, Lindgreen, and Wetzels, 2008). Additionally, service offerings provide revenue streams that are more continuous and less affected by downturns of the economic cycle (Gebauer and Friedli, 2005; Oliva and Kallenberg, 2003). Product sales are usually rather volatile as investment decisions regarding products are often influenced by economic cycles. In contrast, service offerings that are not related to product sales (e.g. maintenance or modernization services) go along with more stable revenue streams over time or even provide higher revenues in times of economic downturn as customers spend more money to ensure functionality of existing products than investing into new ones (Fischer, Gebauer, and Fleisch, 2012).

Third, product-service transition can be a response of manufacturing firms to challenges that result from changing customer behavior. In doing so, manufacturing firms are able to meet increasingly complex customer needs (Oliva and Kallenberg, 2003) and to better serve customers who actively ask for service offerings that accompany products or for customized hybrid solutions (Jaakola and Hakanen, 2013; Ulaga and Reinartz, 2011). Hence, by implementing service-related strategies manufacturing firms employ a specific customer-centric perspective and thus are able to tackle service-related opportunities that result from current ecosystem changes (Galbraith, 2002; Wise and Baumgartner, 1999).

Literature (e.g. Cusumano, Kahl, and Suarez, 2015; Galbraith, 2002; Neely, 2008; Sawhney et al., 2004; Wise and Baumgartner, 1999) refers to numerous manufacturing firms (e.g. General Electric, Rolls-Royce, Siemens, IBM) as illustrative examples for firms that heavily benefit from implementing service-related strategies. Moreover, consulting agencies also highlight

the benefits of product-service transition and recommend pursuing service-related strategies to manufacturing firms (e.g. Krishnamurthy, Johansson, and Schlissberg, 2003; Tellefsen, Studinka, Boessenkool, and Henriksson, 2003). Thus, researchers and consulting agencies agree that product-service transition depicts a means for manufacturing firms to increase their competitive position. Nevertheless, studies (e.g. Baveja, Gilbert, and Ledingham, 2004; Hancock, John, and Wojcik, 2008; Neely, 2008) show that manufacturing firms are very often not able to benefit from changing their strategies toward a distinct focus on service.

The problem is that to date research does still not provide an answer to the question how manufacturing firms can implement changes allowing them to evolve from a traditional product-centric firm toward a firm that is able to pursue a service-related strategy. Effective operationalization of service-related strategies is essential for manufacturing firms to benefit from product-service transition. Yet, existing research has not paid sufficient attention to this topic. Moreover, according to Ostrom et al. (2015) organizational adaptation is a precondition to the implementation of service-related strategies in manufacturing firms. However, they also point to a lack of research focusing on the transformation process that comes along with product-service transition.

This thesis aims at closing this research gap as providing a better understanding of how service-related strategies of manufacturing firms can be formulated and implemented not only calls for further research, but is also of high relevance for managerial practice. In order to provide an answer to this question, research needs to overcome the unidimensional focus on product-service transition that is inherent in many studies on product-service transition (e.g. Fang et al., 2008; Mathieu, 2001; Oliva and Kallenberg, 2003; Tukker, 2004). These studies very often focus on the type of offering when analyzing service-related strategies of manufacturing firm, while other aspects that may play a role in product-service transition do not stand in the central focus of research. Decoupling product-related aspects and service-related aspects results in challenges on an operational level (Baines, Lightfoot, Peppard et al., 2009) and makes it difficult for manufacturing firms to formulate adequate service-related strategies. Instead, interactions among different firm activities (Gebauer, Gustafsson, and Witell, 2011) – service-related as well as non-service related activities – need to be analyzed in order to shed light on the question how manufacturing firms can shift from product-related toward service-related strategies.

Only recently, researchers (e.g. Baines, Lightfoot, Benedettini, and Kay, 2009; Kowalkowski et al., 2012; Kowalkowski, Windahl, Kindström, and Gebauer, 2015) acknowledge that product-service transition is a multifaceted phenomenon and that multiple aspects of the transition process need to be considered. This is necessary in order to advance research and to provide frameworks that help managers to deal with product-service transition challenges. Thus, to adhere to this recent call for a shift toward a multidimensional perspective (Kowalkowski et al., 2015), research in the realm of product-service transition needs to employ a holistic approach that allows for analyzing service-related strategies of manufacturing firms as well as their implementation on an operational level. In particular, the implementation of service-related strategies necessitates the establishment of structures and processes that allows manufacturing firms to provide service to their customers on the one hand. On the other hand, cognitive aspects have to be taken into account as well.

As customers are due to enhanced information and communication technology well informed, they are able to define solutions for themselves. Thus, manufacturing firms need to understand that pursuing service-related strategies aiming at identifying customer needs and solving customers' problems by selling product-service solutions is not sufficient anymore (Adamson, Dixon, and Toman, 2012). Researchers (e.g. Chesbrough, 2011; Ramirez, 1999; Vargo and Lusch, 2004; 2008b) argue that manufacturing firms instead have to operationalize strategies in a way that allows for changes along the whole value creation process. In this context, research (e.g. Normann and Ramirez, 1993; Lusch, Vargo, and O'Brien, 2007) highlights the need for manufacturing firms to rethink their value creation activities by employing a systems perspective that supersedes the traditional firm-centered value chain perspective. This involves an active integration of customers and other business partners into value creation processes (Chesbrough, 2011; Grönroos, 2011a; Lusch, Vargo, and Tanniru, 2010). Therefore, researchers need to abandon the firm-centric perspective on service-related activities in order to adequately examine product-service transition by analyzing both, firm-internal activities as well as the focal firm's interactions with firm-external partners.

To study product-service in an appropriate way, a unit of analysis is necessary that allows for coevally investigating the aspects highlighted above. In this thesis, the business model concept is utilized as a unit of analysis. It is understood as follows: a business model is *"… the design or architecture of the value creation, delivery, and capture mechanisms…"* (Teece, 2010: 172) a firm employs. Hence, the business model concept comprises a cross-functional

perspective and includes different aspects (i.e. resources and capabilities, structures among network partners, the nature of relationships within the network (Amit and Zott, 2001; Demil and Lecocq, 2010; Osterwalder and Pigneur, 2004)) that need to be considered in order to provide a better understanding of product-service transition. Additionally, the concept allows for linking the strategic level and the operational level (DaSilva and Trkman, 2014). Thus, the business model is useful to uncover how potential service-related strategies are operationalized and implemented by manufacturing firms. Additionally, the business model depicts *"… a system of interdependent activities that transcends the focal firm and spans its boundaries"* (Zott and Amit, 2010: 216). Thus, it coevally takes firm-internal as well as firm-external activities into account. Due to the loosely coupled nature of relations with customers and other network partners, other concepts that also allow for examining relations among business partners (e.g. out of alliance, network, or governance literature) cannot be directly transferred to the context of product-service transition (Laudien and Daxböck, 2016b). Hence, employing a business model perspective on product-service transition is an appropriate approach as it helps to overcome the shortcomings of extant research.

However, a lack of studies employing a business model lens on the phenomenon of product-service transition can be observed. Without making explicit use of the business model as a unit of analysis, some researchers (e.g. Kindström, Kowalkowski, and Sandberg, 2013; Kowalkowski, 2010) argue that a manufacturing firm's traditional product-centric business model is not suitable to pursue service-related opportunities. Nevertheless, existing research does not provide insights on how service-related strategies of manufacturing firms can be translated into a business model that allows firms to benefit from these strategies. According to Ostrom et al. (2015), the identification of business models that support the pursuit of service-related opportunities as well as the analysis of the transformation process from product-centric to service-centric business models in manufacturing firms are important topics for future research. Although there is increasing attention on business models in the context of product-service transition literature, this research gap still exists for three main reasons: first, product-service transition researchers (e.g. Kindström et al., 2013; Ulaga and Loveland, 2014) often fail to explain their understanding of business models in their studies. Although these researchers overcome the narrow perspective on service-related activities that is inherent in earlier studies by employing a more holistic perspective on product-service transition, they do not uncover how manufacturing firm business models are designed to facilitate service-related strategies. Second, new business model conceptualizations that are

developed in the context of product-service transition (e.g. Nenonen and Storbacka, 2010; Storbacka, 2011; Storbacka, Windahl, Nenonen, and Salonen, 2013) do not, or only implicitly, draw on insights provided by business model literature. As a result, these new business model conceptualizations again have a rather narrow focus on service-related aspects and thus do not provide a holistic picture of a manufacturing firm's system of activities in the context of product-service transition that are reflected in the business models. Third, only very few researchers (e.g. Kowalkowski et al., 2012; Matthyssens and Vandenbempt, 2008) aim at examining a manufacturing firm's shift from product-related strategies toward strategies with an increased focus on services by employing a process perspective. Therefore, the transformation process that occurs when manufacturing firms implement service-related strategies on a business model level is still underresearched. In this context, business model innovation literature can infuse product-service transition research. Studies (e.g. Khanagha, Volberda, and Oshri, 2015; Chesbrough, 2010) provide first insights on how business model change takes place in established firms. Hence, business model innovation literature points to important aspects that also play a role in the context of product-service transition-triggered business models of manufacturing firms and the respective transformation process. To tackle the research gap identified above product-service transition literature and business model literature need to be explicitly integrated.

Against this background, three research objectives that cover the phenomenon under research in its whole depth need to be highlighted:

1) Characterization of business models that are established by manufacturing firms to support product-service transition.
2) Analysis of how business models of manufacturing firms change in the context of product-service transition.
3) Identification of antecedents of and barriers to business model change in the context of product-service transition.

In focusing on these research objectives, this thesis represents a first answer to the recent call for further research made by Ostrom et al. (2015), who classify research on business models in the context of product-service transition as research priority. This thesis uncovers different service-related strategies of manufacturing firms and explains how these strategies are translated into specific business model configurations. Thus, it particularly contributes to

service management research as it helps to better understand how manufacturing firms can operationalize service-related strategies. Additionally, the thesis reveals how manufacturing firms manage the change process that occurs when new business models are implemented due to product-service transition Thereby, existing product-service transition literature is fundamentally extended as underlying mechanisms that foster or hamper the business model change process are exposed. Additionally, this thesis also considerably enhances research on business model innovation. Demil, Lecocq, Ricart, and Zott (2015) recently emphasize that there is still a lack of research dealing with the process of business model change – especially research regarding business model change of established firms is still in its infancy. Furthermore, they ask under which circumstances business model change might be inappropriate or an inefficient option for firms. By employing a business model perspective on product-service transition of manufacturing firms this thesis provides interesting insights for the process-related research on business model change as factors that influence business model change processes in established manufacturing firms are uncovered. As this thesis examines business model change processes in detail, it also sheds light on the question why manufacturing firms very often fail to capitalize on new, service-related strategies.

The thesis is organized as follows: after this introductory chapter, a literature overview of product-service transition research as well as business model research is provided in chapter 2. These two literature streams build the foundation of this thesis. Chapter 3 explains how the three research objectives that have been identified in chapter 1 are approached. Furthermore, it gives a brief outline on the five research papers that build the body of this thesis. These research papers are consecutive in their development over time, but tackle the three research objectives with self-contained research questions. Thus, they constitute the pillars of the overall research project of this thesis. The five papers are presented in chapter 4. Finally, the overall results, the contribution of the thesis, and managerial implications are discussed in chapter 5. Furthermore, this concluding chapter covers limitations of the thesis and gives an outlook on future research.

2 Overview of Existing Literature

2.1 Insights Provided by Prior Research on Product-Service Transition

More and more researchers in different areas of research analyze product-service transition of manufacturing firms (Lightfoot, Baines, and Smart, 2013; Eloranta and Turunen, 2015). In this subchapter the different perspectives on product-service transition are explained in order to establish a common understanding of the phenomenon under research and to provide a basis for the overall thesis.

Literature on product-service transition originates in the seminal paper by Vandermerwe and Rada (1988). In this paper, Vandermerwe and Rada (1988) make use of the term "servitization" to describe the product-service transition of manufacturing firms. In particular, servitization of business is defined as the general movement characterized by managers of traditional product-centric firms who *"… consciously drive their companies into services to gain competitive ground …"* (Vandermerwe and Rada, 1988: 315). Vandermerwe and Rada (1988) regard servitization as a shift or change of strategic focus that concerns the firm as a whole and has influence on the overall value creation logic a firm employs. Similarly, Grönroos (1990) as well as Quinn, Doorley, and Paquette (1990) argue that manufacturing firms need to think in terms of total value delivered to and experienced by the customer instead of merely in terms of offerings.

After these early publications on product-service transition that place emphasis on regarding a manufacturing firm's overall shift toward a service-related strategy in a holistic way, research interest on the topic slowly increased (e.g. Anderson and Narus, 1995; Martin and Horne, 1992; Voss, 1992). In the late 1990s and early 2000s a considerable and relevant increase in the number of studies on product-service transition took place (e.g. Galbraith, 2002; Wise and Baumgartner, 1999; Oliva and Kallenberg, 2003; Phillips, Ochs, and Schrock, 1999) (see Lightfoot et al. (2013) for an overview of the development of the research topic). Researchers who analyze product-service transition use different terms interchangeably to describe the phenomenon. The terms that are referred to most commonly are "service transition" (e.g. Fang et al., 2008; Gebauer and Friedli, 2005; Oliva and Kallenberg, 2003; Salonen, 2011; Ulaga and Loveland, 2014), "service infusion" (e.g. Kowalkowski, Witell, and Gustafsson, 2013; Kowalkowski et al., 2012; Ostrom et al., 2010), and "servitization" (Baines, Lightfoot,

Benedettini, and Kay, 2009; Kastalli, van Looy, and Neely, 2013; Neely, 2008; Turunen and Finne, 2014). To avoid misunderstandings only the term product-service transition is used throughout the thesis, although insights from researchers who make use of other terms are considered as well.

Interestingly, the strong research focus on the overall strategic change related to the whole firm that was inherent in the initial publications (Grönroos, 1990; Quinn et al., 1990; Vandermerwe and Rada, 1988) is not predominant in later work on product-service transition. Instead, main emphasis is placed on the particular portfolio of offerings a manufacturing firm needs to provide to its customers in order to pursue product-service transition. In this context, terminology is also inconsistent as researchers use a variety of terms such as "product-service systems" (Martinez, Bastl, Kingston, and Evans, 2010; Neely, 2008), "hybrid offerings" (Shankar, Berry, and Dotzel, 2009; Ulaga and Reinartz, 2011), or "integrated solutions" (Paiola, Saccani, Perona, and Gebauer, 2013; Matthyssens and Vandenbempt, 2008; Tuli, Kohli, and Bharadwaj, 2007) to describe a new type of offering in which products are enhanced by services.

It is important to know that research on product-service transition developed in autonomous research areas as research communities related to these different areas initially analyzed the phenomenon from their own respective disciplinary perspectives. Only recently a convergence of the various research communities can be observed (Lightfoot et al., 2013; Ostrom et al., 2015). Three research areas have to be highlighted in particular: (1) service management literature, (2) operations management literature, (3) and literature discussing aspects of value creation.

(1) The paper by Oliva and Kallenberg (2003), which discusses how manufacturing firms can manage the transition from products to services, triggered the first area of research that is embedded in service management literature. Subsequent research departs from Oliva and Kallenberg's (2003) basic assumption that manufacturing firms can occupy different positions along the so-called product-service continuum when pursuing product-service transition. This continuum ranges from a product-centric strategy with high importance of tangible goods on the one end to a service-related strategy that places great importance on intangible goods on the other end. In this context, researchers usually focus on one particular aspect of the product-service transition (Kowalkowski et al., 2015). They analyze, for instance, different types of offerings along the continuum (Mathieu, 2001) or changes in the nature of customer

relationships along the continuum (Tuli et al., 2007). However, implementing a service-related strategy is not an easy task for manufacturing firms. As a consequence, research moved away from examining the transition dimension itself in order to place emphasis on the analysis of managerial problems related to service transition processes and the development of suggestions how to solve these problems. In doing so, researchers examine specific aspects related to product-service transition independently.

On the one hand, researchers (Gebauer and Fleisch, 2007; Fang et al., 2008; Nordin, Kindström, Kowalkowski, and Rehme, 2011) highlight strategic risks (e.g. due to the loss of strategic focus or the failure to achieve stakeholder acceptance regarding new strategies) as well as operational risks (e.g. resulting from the challenge to align product- and service-related organizational processes and structures or from leadership issues) that come along with product-service transition. On the other hand, Gebauer et al. (2005), for instance, point to cognitive barriers that may hamper the transition from products to services. Furthermore, research (Gebauer, Edvardsson, and Bjurko, 2010; Gebauer and Friedli, 2005) suggests that the establishment of a specific service-oriented culture is a prerequisite to a manufacturing firm's product-service transition.

Additionally, studies in this first area of research emphasize the limited possibility to transfer capabilities that stem from the traditional product business to the new service-related business (Salonen, 2011; Ulaga and Reinartz, 2011). In particular, Ulaga and Reinartz (2011) examine capabilities that are directly related to the provision of service offerings such as capabilities allowing firms to process and interpret service-related data or the capability to design new service-based offerings. In contrast, Möller and Törrönen (2003) emphasize that manufacturing firms need to develop specific relational capabilities that enable manufacturing firms to better understand customer needs. Another capability-based perspective on product-service transition is employed by Fischer, Gebauer, Gregory, Ren, and Fleisch (2010) who focus on the analysis of dynamic capabilities that facilitate service-related strategies in manufacturing firms. While the findings of these studies provide interesting insights on managerial aspects of product-service transition, they usually disregard the interplay of various factors that play a role in this context (Gebauer et al., 2011; Kowalkowski et al., 2015).

(2) Regarding operations management literature, operational processes in manufacturing firms and in service firms have been two separate disciplines since the 1970s (Heineke and

Davies, 2007). In the context of manufacturing firms, operations management research used to focus mainly on the analysis of production processes. However, the examination of service operations in a manufacturing firm setting recently gains increasing attention (Baines, Lightfoot, Benedettini, and Kay, 2009; Kastalli and van Looy, 2013; Lightfoot et al., 2013). Especially research interest on product-service systems (i.e. offerings that integrate products and services to provide value-in-use (Baines et al., 2007; Neely, 2008)) rose since the late 1990s (e.g. Goedkoop, Haler, te Riele, and Rommers, 1999; Mont, 2001; Tukker, 2004). Similar to Oliva and Kallenberg's (2003) basic understanding of the product-service transition, researchers in the area of operations management develop frameworks that classify different types of product-service systems with solely product-based offerings and solely service-based offerings as the two extremes of a product-service continuum. In contrast to the first research area, these classification schemes focus on characterizing the features and examples of different types of product-service systems in detail (Baines, Lightfoot, Peppard et al., 2009). Additionally, operations management literature discusses how manufacturing firms can orchestrate their service-related operations. In particular, aspects such as vertical integration or the importance to gain control over the supply chain are analyzed (Schmenner, 2009). Furthermore, relationships between a manufacturing firm and its customers are investigated. However, in contrast to service management literature that analyzes the nature of relationships, operations management literature (e.g. Guajardo, Cohen, Kim, and Netessine, 2012; Kim, Cohen, and Netessine, 2007) focuses for instance on examining appropriate contracting mechanisms in the context of product-service systems. However, studies in this area of research also shift away from a narrow focus on service operations in manufacturing firms. Martinez et al. (2010), for example, identify barriers to product-service transition that are similar to barriers identified in the realm of service management-related product-service transition literature. In particular, Martinez et al. (2010) highlight that the transition toward an integrated product-service-oriented organization requires not only the capabilities to design and deliver product-service systems, but also the development of new capabilities, the establishment of new internal processes, a specific product-service culture, specific relationships to customers, and an alignment of strategies.

(3) The third research area does not explicitly analyze manufacturing firms' product-service transition. Instead, this research stream discusses the value creation logic of firms from a general point of view. While research in the first area (e.g. Kindström et al., 2013) points to the need to change a firm's underlying logic without addressing the topic in detail, this third

area of research directly focuses on this important topic. According to researchers who employ this specific focus on a firm's value creation logic (e.g. Chesbrough, 2011; Normann and Ramirez, 1993; Vargo and Lusch, 2004), firms need to consider the set of activities that results from product and service provision. Moreover, they need to rethink the roles of and relations among actors in the whole value creating system instead of thinking in terms of products and services that are provided to customers. This understanding is basically in line with the reasoning by Vandermerwe and Rada (1988) or Grönroos (1990) who already emphasize that manufacturing firms need to establish an enhanced understanding of customers' value creation processes and think about how the firm's offerings (regardless whether tangible, intangible, or hybrid) contribute to the utility a customer receives from the purchase.

This third research area does not consist of a homogenous group of researchers, but is rather dispersed. Nevertheless, the basic findings and suggestions of various researchers who deal with aspects of value creation are commensurable. Among these different groups of researchers the so-called "Nordic School" of service marketing (Gummesson and Grönroos, 2012) points out that service should not be regarded as a specific type of offering, but rather as a way of thinking or a way of doing business (Gummesson, 2007; Grönroos, 2006; Edvardson, Gustafsson, and Roos, 2005). At the same time, Vargo and Lusch (2004) called for a move toward a so-called service-dominant logic in which the traditional dichotomy of goods and services is replaced by a radical distinct perspective on service which is defined *"… as the application of specialized competences (knowledge and skills) through deeds, processes, and performances for the benefit of another entity"* (Vargo and Lusch, 2004: 2). The Nordic School as well as service-dominant logic originate in marketing. However, literature related to strategic management emphasizes similar aspects. Priem (2007; see also Priem, Li, and Carr, 2012), for instance, highlights the need to employ a consumer perspective on value creation. Consumers need to be considered in strategy formulation as the creation of benefits for consumers has a strong influence on a firm's profit generation.

Despite the dispersed nature of research in this third area, there is mutual agreement among all researchers in this realm concerning three main elements. These three elements are of central importance in this area of research and therefore demand further attention. First, instead of focusing on "value-in-exchange" (i.e. value that is created during the manufacturing process by the focal firm and evaluated by the price that is paid in the market)

(Vargo, Maglio, and Akaka, 2008; Vargo and Morgan, 2005), value is co-created during coordinated interaction processes among various actors (focal firm, customers, or other stakeholders) (Grönroos, 2011a; Lusch et al., 2010; Vargo and Lusch, 2008b). Second, researchers (e.g. Vargo and Lusch, 2004: Prahalad and Ramaswamy, 2000) emphasize that active customer integration is crucial to value creation processes as customers act as a valuable source of knowledge. This allows firms to continuously learn about and adjust to changing ecosystem conditions and thus to offer adequate value propositions to their customers (Payne, Storbacka, and Frow, 2008; Lusch et al, 2007; Lusch et al. 2010). Third, a specific value network perspective that supersedes the traditional value chain perspective is the third main element that is addressed by this area of research (Chesbrough, 2011; Vargo and Lusch, 2008b; Normann and Ramirez, 1993). This means that direct linkages to various network partners as well as indirect linkages to third parties need to be considered in value creation processes. Therefore, researchers (e.g. Vargo and Lusch, 2004; 2008b) argue that employing a systems perspective on value creation is necessary.

Lightfoot et al. (2013) emphasize the need to enhance linkages among the various research communities as this improves cohesion and represents an opportunity to enrich future research agendas. To date, a convergence between the first two literature areas can be observed (Ostrom et al., 2015). Although the third research area is not directly related to the phenomenon of manufacturing firm's product-service transition, the main elements discussed by researchers in this context are also of high relevance for manufacturing firms dealing with product-service transition. Therefore, the basic ideas that are promoted by this area of research found their way into product-service transition research (e.g. Gebauer et al., 2011; Matthyssens and Vandenbempt, 2008; Salonen, 2011). Kindström et al. (2013) emphasize that the underlying logic or the firm's mental model on how to create value heavily influences the firm's ability to recognize and pursue service-related opportunities. A firm's strategic thinking in terms of product and service offerings needs to be replaced by a new ground-breaking value creation logic which includes a broader perspective on activities performed by various network partners (Kindström et al., 2013; Kowalkowski et al., 2012; Matthyssens and Vandenbempt, 2008). This firm logic is also heavily influenced by industry-wide "rules of the game" (Matthyssens and Vandenbempt, 2008: 326), which make it even more difficult for manufacturing firms to change their traditional way of doing business.

To overcome the firm-centric perspective, product-service transition literature more and more adopts the idea that value creation is an iterative process, which repeatedly crosses the boundaries of the firm. In particular, the surrounding business ecosystem (customers, complementors, business partners, or other third parties) needs to be considered by manufacturing firms (Chesbrough, 2011; Turunen and Finne, 2013; Vargo and Lusch, 2008b). Close interactions between manufacturing firms and their customers are common in business-to-business settings and have been extensively analyzed in the realm of customer relationship management in the context of industrial management (Ballantyne, 2004). However, interacting with and building relationships to single customers is different from value creation within complex networks. Moreover, as manufacturing firms need to develop expertise in the field of services (Salonen, 2011; Ulaga and Reinartz, 2011) their internal knowledge sources are not sufficient anymore. Knowledge inputs from customers and network partners are necessary (Mina, Bascavusoglu-Moreau, and Hughes, 2014; Chesbrough, 2011). However, a manufacturing firm's relations to existing business partners may not be useful to pursue service-related opportunities (Leek and Canning, 2011). Therefore, researchers (e.g. Frankenberger, Weiblen, and Gassmann, 2013; Gebauer, Paiola, and Saccani, 2013; Jaakkola and Hakanan, 2013; Leek and Canning, 2011) recently shift their focus toward an analysis of the whole value network in order to better understand how service transition processes affect manufacturing firms. Results of these studies show that different types of networks exist that enable a manufacturing firm's transition toward service. They emphasize the need for manufacturing firms to consider aspects such as customer centricity (Frankenberger, Weiblen, and Gassmann, 2013), resources that are being exchanged within the network (Jaakkola and Hakanen, 2013), or capabilities that are necessary for establishing and sustaining the network (Gebauer et al., 2013).

2.2 Insights Provided by Prior Research on Business Models and Business Model Change

Interest on business models took off with the emergence of e-businesses in the era of the "new economy" (Zott, Amit, and Massa, 2011; Morris, Schindehutte, and Allen, 2005). An exponential increase in the number of studies that deal with business models and business model innovation can be observed ever since (Spieth, Schneckenberg, and Ricart, 2014; Osterwalder, Pigneur, and Tucci, 2005; Zott et al., 2011). As the business model represents a

unit of analysis that is still not clearly defined in literature (Spieth et al., 2014; Zott and Amit, 2013; Zott et al., 2011), but which is central to this thesis, this subchapter aims at developing a basic understanding of this concept.

The term "business model" first came up in academic work by Bellman, Clark, Malcolm, Craft, and Ricciardi (1957) and Jones (1960). However, the authors of these articles only refer to the term without elaborating on what a business model is. Osterwalder et al. (2005) emphasize that many researchers still use the term business model rather as a label without understanding the concept's general background or its basic function. Furthermore, the business model concept is often used interchangeably with other concepts such as strategy or tactics (Casadesus-Masanell and Ricart, 2010; DaSilva and Trkman, 2014; Zott and Amit, 2013). The fact that a variety of different definitions and conceptualizations of business models exist in literature (George and Bock, 2011; Morris et al., 2005; Zott et al., 2011) does not help to resolve this issue.

Despite the variety of different definitions, there is a general agreement that a business model comprises value creation and value delivery mechanisms (Casadesus-Masanell and Ricart, 2010; DaSilva and Trkman, 2014) as well as the value capture potential of the focal firm (Osterwalder and Pigneur, 2010; Teece, 2010; Chesbrough, 2007a). This thesis emphasizes the operational role of business models (Spieth et al., 2014). The business model concept is regarded as *"… a reflection of the firm's realized strategy"* (Casadesus-Masanell and Ricart, 2010). Hence, a business model operationalizes strategy and thus becomes *"… a working model of a firm's strategy"* (Cortimiglia, Ghezzi, and Frank, 2016: 415). Furthermore, the business model is seen as a new unit of analysis at the system level (Zott and Amit, 2013). Thus, a business model represents not only the value creation architecture of a focal firm, but also comprises linkages to firm-external network partners (Osterwalder and Pigneur, 2004; Teece, 2010; Zott and Amit, 2010). However, Zott and Amit (2013) emphasize that due to the absence of a common, unified definition of the business model concept it is necessary to clearly define and explain the business model concept in the context of a study's research question.

The lack of definitional clarity results from the parallel emergence of the business model concept in different research fields such as strategy research, entrepreneurship literature, or technology and innovation management literature (Demil et al., 2015; Zott et al., 2011) as well as its popularity in non-scientific publications and management practice (George and

Bock, 2011). Furthermore, the business model concept is utilized to analyze different research objects (Zott et al., 2011). Moreover, researchers and practitioners assign different roles and functions to the business model concept that depend on the distinct motivation that drives the researcher's respective research interest on business models (Spieth et al., 2014). Three main research areas within business model literature can be identified: (1) research dealing with e-business models; (2) the identification of business models in a more general setting; and (3) research employing a dynamic or transformational perspective on business models.

(1) The first area of research is linked to studies on technology-based firms that make extensive use of the World Wide Web to conduct business. Researchers aim at analyzing innovative value creation processes and organizational designs that became possible due to advancements in information and communication technology in the late 1990s. As the value creation mechanisms that these firms employ are considerably different from the business logic of traditional firms that do not rely on web-based technologies to do business at that time, a new unit of analysis was necessary to better understand these innovative ways of doing business (DaSilva and Trkman, 2014; Zott and Amit, 2013). Hence, researchers study different types of these new firms to develop taxonomies and to identify particular components of these firms' business models (e.g. Afuah and Tucci, 2001; Alt and Zimmermann, 2001: Amit and Zott, 2001; Mahadevan, 2000; Weill and Vitale, 2001; Osterwalder and Pigneur, 2004; Timmers, 1998). The resulting archetypes of e-business models were not necessarily congruent as different researchers examined various aspects in this context (e.g. different ways to conduct e-business or the role of a specific firm within the whole value network) (Zott et al., 2011). Usually these components are analyzed independently neglecting any relationships that might exist between different business model components. Furthermore, research on e-business models is rather descriptive in nature. Researchers usually neither refer to a clear theoretical basis nor consider empirical testing (Zott et al., 2011). Two exceptions are Osterwalder (2004) who highlights interrelationships between different business model components as well as Amit and Zott (2001) who base their business model conceptualization on theories that are well-established within the realm of management and strategy literature.

(2) A second area of literature employs the business model concept in order to analyze value creation in a more general research context. This literature stream was mainly triggered by the crash of the dot-com bubble (DaSilva and Trkman, 2014). Researchers place strong emphasis

on customer-focused value creation processes and the analysis of value creation among cooperative business partners (Zott et al., 2011). According to Osterwalder et al. (2005) researchers in this realm make use of the business model concept in different ways. A first group of researchers aims at explaining "real world" examples by depicting the individual business model of a particular firm in detail (e.g. Kraemer, Dedrick, and Yamashiro, 2000; Chesbrough and Rosenbloom, 2002). While these studies help to better understand specific business models, they fail to provide a general understanding of the business model concept. In contrast, a second group (e.g. Teece, 2010; Zott and Amit, 2010) identifies – similar to research on e-business models – specific business model components or develops overarching meta-models that allow for describing a business model irrespective of the particular type of firm or industry (Osterwalder et al., 2005).

However, the multitude of different business model conceptualizations also leads to further fragmentation of the research stream. Therefore, a more detailed analysis of these conceptualizations is necessary. Morris et al. (2005) already provide an extensive overview of a variety of different business model conceptualizations that are developed and utilized by researchers in the context of e-businesses as well as more general business settings. However, researchers continued to contribute to this discussion by developing additional business model configurations. To identify different business model conceptualizations that are of relevance in the context of this thesis, a keyword search including the terms "business model" + "component", "element", "ontolog*", "meta-model", or "conceptualization" in SciVers Scopus was utilized. Only publications that meet academic quality standards (indicated by being listed in Thomson Reuters Citation Index or VHB Jourqual) are considered. Additionally, a berrypicking approach as suggested by Bates (1989) was employed to identify business model conceptualizations that are not published in academic literature, but cited by researchers in academic studies. This berrypicking approach pointed particularly to the business model conceptualization by Osterwalder and Pigneur (2010), which is very often utilized to analyze business models in academic research. Nevertheless, only publications in English language are included. Additionally, business model conceptualizations that are published in academic journals, but lack scientific rigor, are excluded. For example, Johnson, Christensen, and Kagermann's (2008) business model conceptualization published in Harvard Business Review is not developed based on a scientifically traceable approach and therefore not utilized in the context of this thesis.

A majority of the identified business model conceptualizations are developed against the background of e-businesses and have never been applied to a general setting. These e-business model conceptualizations are also excluded from the further analysis. In addition, business model conceptualizations that do not explicitly refer to a particular setting, but are developed out of prior literature on e-businesses are excluded (e.g. the business model conceptualization by Shafer, Smith, and Linder (2005)). To further delimit the number of possible business model configurations, models that explicitly employ a focus on business model innovation are excluded. Voelpel, Leibold, and Tekie (2004), for instance, identify three generic elements in business models based on prior literature. However, their definitions of these elements highlight the role of business model reinvention, which is emphasized in their paper (e.g. *new* customer value proposition, or value network *re*configuration).

The following business model conceptualizations (see table 2.2–1) are identified as result of the applied search criteria. They exemplify the diversity of business model conceptualizations. All these business model conceptualizations are applicable in a general business setting. Their relevance in academic literature is reflected in high citation rates. Moreover, these business model conceptualizations depict the essence of business model research of the last two decades.

Author(s), Year	**Business model conceptualization**	**Employed research method**
Chesbrough and Rosenbloom, 2002 (see also Chesbrough, 2007a)	Six business model components are defined: ▪ Value proposition ▪ Target market ▪ Value chain ▪ Revenue mechanisms ▪ Value network or ecosystem ▪ Competitive strategy	Business model conceptualization is based on prior work (Chesbrough, 2000 – working paper) which makes use of a conceptual approach; the resulting business model conceptualization is employed in a multiple-case study comprising 35 spin-offs of Xerox Corporation; six of these cases are presented in Chesbrough and Rosenbloom (2002)
Demil and Lecocq, 2010	Business models consist of three main components: ▪ Resources and competences ▪ Internal and external organization ▪ Value proposition These business model components influence the volume and structure of: ▪ Revenues ▪ Costs	Business model conceptualization is based on prior work (Lecocq, Demil, and Warnier, 2006 – French language paper) which makes use of a conceptual approach; the resulting so-called RCOV model is mirrored against a single-case study.

Osterwalder and Pigneur, 2010	Four main business model pillars are identified (that can be further fragmented into nine business model building blocks): ▪ Product (value proposition) ▪ Infrastructure management (key activities, key partners, key resources) ▪ Customer interface (customer relationships, customer segments, channels) ▪ Financial aspects (cost structure, revenue streams)	Business model conceptualization is based on prior work (Osterwalder, 2004) which makes use of a thorough modeling approach; the resulting prior conceptualization (Osterwalder, 2004) was further developed and subsequently applied and tested in firms around the world in multiple industries
Teece, 2010	Six business model components are described that are interlinked with each other: ▪ Selection of technologies and features to be embedded in the product/service ▪ Benefits the customer derives from consuming/using the product/service ▪ Market segments to be targeted ▪ Available revenue streams ▪ Design mechanisms to deliver value ▪ Design mechanisms to capture value	Business model conceptualization is based on a conceptual approach and makes use of illustrative cases
Zott and Amit, 2010	Three business model design elements are explained ▪ Content ▪ Structure ▪ Governance These elements are orchestrated and connected by four business model design themes ▪ Novelty ▪ Lock-in ▪ Complementarities ▪ Efficiency	Business model conceptualization is based on prior work (Amit and Zott, 2001) which is grounded on a cross-theoretical foundation and makes use of a multiple-case study comprising 59 case firms
George and Bock, 2011	Three underlying dimensions of business models are identified: ▪ Resource structure ▪ Transactive structure ▪ Value structure	Business model conceptualization is based on a systematic literature review including research papers out of business model literature until December 2008; following a discourse analysis was conducted comprising of 151 surveys from managers of 130 Indian firms

Table 2.2-1: Business model conceptualizations by different authors.
Source: Own illustration.

In general, conceptualizations of business models are helpful as they provide a framework of analysis that enables researchers to compare business models of different firms on an objective basis. To ensure the selection of a suitable business model configuration as a unit of analysis in the context of this thesis, the applicability of the business model configurations presented in table 2.2–1 needs to be examined in more detail. The business model

conceptualizations by Chesbrough and Rosenbloom (2002), Demil and Lecocq (2010), and Teece (2010) can be criticized for their lack of theoretical embeddedness. Additionally, only Chesbrough and Rosenbloom's (2002) model is empirically supported as it is applied in a qualitative-empirical study, while the other two are not empirically validated (the insights gathered by Demil and Lecocqs' (2010) single-case study which analyzes the English soccer club Arsenal FC are rather difficult to transfer to a different setting). However, Chesbrough and Rosenbloom's (2002) business model conceptualization does not clearly distinguish between the business model concept and the strategy concept. This is an essential weakness of this business model conceptualization. A clear distinction between the strategy concept and the business model concept is crucial as otherwise the business model as a concept becomes redundant (Arend, 2013). Although George and Bock's (2011) explanation of business model dimensions is from a methodological point of view clearly traceable, their study has a strong focus on entrepreneurial firms. Hence, it is questionable whether their understanding of the underlying business model dimensions also applies in a manufacturing firm context. In contrast, the remaining two business model conceptualizations by Zott and Amit (2010) and Osterwalder and Pigneur (2010) seem to be appropriate in the context of this thesis' research objectives.

Morris et al. (2005) point out that business model conceptualizations typically lack a thorough theoretical basis. Amit and Zott's (2001) original business model conceptualization is based on a multiple-case study and grounded in well-established theories. Hence, it represents a notable exception from the majority of business model conceptualizations that are not embedded in a theoretical background (Morris et al., 2005). In particular, the meta-model was developed by linking insights from transaction cost economics (e.g. Williamson, 1975; 1979), the resource-based view (e.g. Amit and Schoemaker, 1993; Barney, 1991; Wernerfelt, 1984), network theory (e.g. Shapiro and Varian, 1999; Katz and Shapiro, 1985), and Schumpeterian innovation (Schumpeter, 1934). Amit and Zott's (2001) inherent focus on e-businesses was abandoned in the updated version (Zott and Amit, 2010). Although Zott and Amit's (2010) paper is only conceptual in nature, the transfer of the original conceptualization to a general business setting is traceable. The theoretical basis on which the original conceptualization was grounded still applies as the well-established theories that helped to explain e-business models (Amit and Zott, 2001) have been developed prior to the emergence of e-businesses. All in all, due to its strong theoretical foundation the meta-model by Amit and Zott (2001; see also Zott and Amit, 2010) represents a valuable tool for academic

research that is already utilized in empirical studies (e.g. Cheng, Shiu, and Dawson, 2014; Zott and Amit, 2007; 2008).

Osterwalder's (2004) original business model conceptualization is based on a rigorous modeling approach (see also Osterwalder and Pigneur, 2004). The updated model – the so-called business model canvas (Osterwalder and Pigneur, 2010) – was tested in firms around the world in multiple industries in order to develop a tool that helps managers and entrepreneurs to describe, analyze, and design business models. Thus, the business model canvas is not only well-established in the context of entrepreneurship education (e.g. Blank and Dorf, 2012), but also in managerial practice in a general setting. Moreover, Osterwalder and Pigneur (2004; 2010) also highlight interdependencies among business model elements, which helps managers to better understand how changes in one business model building block affect the whole business model. Therefore, Osterwalder and Pigneur's (2004; 2010) business model canvas has an advantage over other business model conceptualizations as most conceptualizations do not illustrate the interrelationships among business model elements in detail (Zott et al., 2011).

(3) A third research area deals with a transformational view (Demil and Lecocq, 2010) on business models. Researchers emphasize that a static approach that examines state of the art business models as well as novel business models of different firms is insufficient to explain how firms achieve a competitive advantage. Instead, research particularly aims at analyzing business model innovation and thus addresses changes in existing business models (e.g. Amit and Zott, 2012; Bock, Opsahl, George, and Gann, 2012; Casadesus-Masanell and Zhu, 2013; Sanchez and Ricart, 2010). This transformational perspective on business models is highly relevant in the context of this thesis. Business model innovation is often necessary if firms want to unlock potential benefits of new strategies (Amit and Zott, 2012; Johnson et al., 2008). Moreover, some researchers (e.g. Amit and Zott, 2012; Demil et al., 2015) emphasize that firms can achieve business model innovation by restructuring existing resources. Therefore, innovating the business model is according to Amit and Zott (2012) especially beneficial for manufacturing firms as business model innovation is said to be less costly and less time consuming than product innovation. However, the definitional ambiguity regarding the business model concept affects research on business model innovation and causes further inconsistencies regarding definitions and terminology (Spieth et al., 2014; Schneider and Spieth, 2013; Casadesus-Masanell and Zhu, 2013). To avoid misunderstandings the particular

understanding of business model change is explained and definitions are provided whenever relevant within the research papers presented in this thesis.

In general, the literature area that deals with business model innovation very often employs an entrepreneurial perspective (Demil et al., 2015) and highlights that business model innovation is a strategic tool that allows firms to benefit from the potential of a new value creation logic (Cortimiglia et al., 2016; Casadesus-Masanell and Zhu, 2013). Business model innovation is defined as a radical innovation that involves the design of business models that are fundamentally new and able to break the existing value creation logic of an industry (Comes and Berniker, 2008; Markides, 2006). In order to accomplish business model innovation, firms not only need to reframe the employed business logic, but also have to think about novel customer value propositions as well as structural reconfigurations (Spieth et al., 2014). By introducing such radically new business models to the market, firms are able to create a competitive advantage (Amit and Zott, 2012; Michell and Coles, 2003).

When analyzing business model innovation, researchers often focus on highly innovative established firms or on new ventures (Amit and Zott, 2012; Chesbrough, 2007a; Demil et al., 2015). However, business model change is not only linked to firms with a high entrepreneurial orientation. Instead, changing the business model is relevant for all kind of firms as business models are generally not stable over time (Demil and Lecocq, 2010; Doz and Kosonen, 2010), but have to be adjusted especially if environmental conditions change (Bucherer, Eisert, and Gassmann, 2012; McGrath, 2010; Teece, 2010). This calls for reconsidering the narrow definition of business model innovation that only comprises radical new business models. Researchers (e.g. Bucherer et al., 2012; Demil and Lecocq, 2010) suggest classifying different types of business model innovation according to the degree of innovativeness. Schneider and Spieth (2013) point to the need to distinguish between radical business model innovation and more incremental development of the business model that involves adjustments and improvements. Moreover, Cavalcante, Kesting, and Ulhøi (2011) highlight that considering different types of business model changes is especially relevant when analyzing business model change in established firms. As the research objectives of this thesis are linked to established manufacturing firms that pursue a transition from products to services, a more broad definition of business model change that includes both, radical as well as incremental changes, seems to be appropriate

Additionally, the opportunity-related perspective regarding business models as a strategic option, which eventually leads to growth and competitive advantage, needs to be questioned in the context of this thesis. First of all, research (Demil and Lecocq, 2010; Doz and Kosonen, 2010) shows that even if business model innovation represents an opportunity, firms need specific capabilities to successfully approach business model innovation. Moreover, the capability to innovate a business model in a systematic way itself can be regarded as a distinct dynamic capability (Mezger, 2014). Studies show that designing a novel business model does not warrant success. Instead, firms need to be able to thoroughly implement the new business model on an operational level in order to benefit from its potential (Brea-Solís, Casadesus-Masanell, and Grifell-Tatjé, 2015). Moreover, Desyllas and Sako (2013) show that even after a successful implementation, the new business model needs to be defended against competitors. Hence, the business model not only needs to reflect a suitable strategy in an accurate way, but it also has to be managed over time to provide a sustainable competitive advantage (Brea-Solis et al., 2015; Desyllas and Sako, 2013). However, this is not an easy task for established firms as barriers to business model change hamper the implementation of new business models and the continuous adjustment of existing business models. In this context, Chesbrough (2010) highlights cognitive barriers. Managers' decisions regarding business model design seem to be influenced by a firm's success with an extant business model. Sosna, Trevinyo-Rodriguez, and Velamuri (2010) also emphasize the hampering effect of mangers' prior experience and existing knowledge in business model innovation processes. These aspects may hinder firms to capitalize on the potential of an innovative business model. A second reason for abandoning the opportunity-driven perspective on business model innovation is provided by Bucherer et al. (2012) who show that some firms do not proactively pursue the opportunity to innovate their business model. Rather business model innovation is a reaction to threats these firms perceive either internally or from the external environment. Third, Khanagha et al. (2014) point out that business model innovation can even represent a threat to an established firm as novel business models may cannibalize the extant business model of a firm. Furthermore, they explain that business model innovation is a highly complex and uncertain process that requires an extensive amount of resources. This clearly contradicts the viewpoint of Amit and Zott (2012) who regard business model innovation as less cost intensive alternative to other types of innovation. Therefore, both perspectives on business model change – the opportunity-related as well as the threat-driven perspective– are considered relevant in the context of this thesis.

To date, only few studies analyze business model innovation processes in detail. Cortimiglia et al. (2016) analyze the linkage between the strategy making process and business model innovation. They provide evidence that business model innovation is strongly linked to the strategy implementation phase. Furthermore, their study indicates that the way how firms approach business model innovation depends on whether these firms develop new business models based on internal firm strengths or on an analysis of external market conditions. In their single-case study Sosna et al. (2010) show that business model innovation is a step-by-step process that involves trial-and-error learning. This insight is further supported by Khanagha et al. (2014) who emphasize – also against the background of a single-case study – the emergent nature of the experimental learning process that leads to business model innovation in an established firm. However, the process of business model innovation in established firms – and especially the problems that might be occur in this context – is by now still not explained in sufficient detail (Demil et al., 2015).

2.3 Insights Provided by Prior Research Applying the Business Model Concept in the Realm of Product-Service Transition

Service research (e.g. Ostrom et al., 2015; Storbacka, 2011) recently calls for a utilization of the business model concept to study product-service transition. Spring and Aurejo (2009: 444) already claim that *"… the notion of the business model is useful as an integrating concept"* in the context of product-service transition. They explicitly refer to business model literature and argue that aspects that are embedded in the business model concept (e.g. network structure, the access to and transfer of network partner capabilities) can be useful in product-service transition research. Nevertheless, empirical studies that employ the business model concept as a unit of analysis in the context of product-service transition are still rare.

Barquet, de Oliveira, Amigo, Cunha, and Rozenfeld (2013) develop a business model framework that supports a manufacturing firm's strategic focus on a product-service system. Basis for this newly developed framework is a literature review that comprises literature on product-service systems as well as business model literature. In particular, Barquet et al. (2013) refer to Tukker's (2004) classification of product-service systems and link it to Osterwalder and Pigneur's (2010) business model canvas. In a next step, a single-case study is conducted in order to test the theoretically developed business model framework in a first reality-check. As the authors employ a rather normative approach in order to provide a useful

tool for firms that want to benefit from implementing product-service systems, the study does not present in-depth insights how product-service transition influences a manufacturing firm's business model.

In contrast, Witell and Löfgren (2013) seek to identify, describe, and analyze how manufacturing firms use business model innovation to support service-related strategies. They conduct a multiple-case study that comprises six manufacturing firms in order to analyze the change process of the respective business models in detail. While the authors provide interesting insights – especially their findings which point to both incremental as well as radical business model innovation are intriguing – the results are from a scientific point of view somewhat difficult to trace. In particular, it is not fully clear why Witell and Löfgren (2013) coevally make use of the business model conceptualizations by Osterwalder and Pigneur (2010) and Zott and Amit (2010) in order to analyze business model innovation in manufacturing firms. On the one hand, each of the two business model conceptualizations is related to a very different basic understanding of the business model concept. On the other hand, employing both business model conceptualizations at the same time increases complexity. However, this approach does not necessarily enhance the depth of the findings. Hence, coevally making use of both business model conceptualizations is somewhat confusing – especially since the authors do not explicitly explain the benefits of their approach.

More recently, Kindström and Kowalkowski (2014) depict characteristics of business model elements that help manufacturing firms to innovate service offerings. To identify business model elements they employ a synthesizing research approach that draws on data from several previously conducted research projects. The findings result in a new business model conceptualization and provide interesting insights on specific resources and capabilities that are needed to support a manufacturing firm's business model in the context of product-service transition. However, the business model conceptualization comprises elements such as strategy or organizational structure. In their paper, Kindström and Kowalkowski (2014) fail to clearly distinguish these concepts. This is a mistake that can be observed in various studies that refer to the business model concept as the term "business model" has become a buzzword that is used to explain various phenomena (DaSilva and Trkman, 2014). Therefore, it is necessary to provide a clear explanation of the research approach applied in this thesis before tackling the three research objectives identified above.

3 Explanation of the Applied Research Approach

Ostrom et al. (2015) call for more interdisciplinary research in the context of service research. Especially service management literature is still in its infancy and could benefit from input provided by management research in order to foster the development of more adequate constructs and theories (Ostrom et al., 2015). Integrating and synthesizing insights from product-service transition literature and business model literature seems to be an appropriate first step in this direction. With respect to business models, research that goes beyond conceptual work or single-case studies is – despite the increasing attention to the topic – still rare (Demil et al., 2015) and thus lacks well-defined and empirically validated constructs. Therefore, an exploratory research approach is necessary.

The three main research objectives of this thesis are approached in a stepwise way. This way of proceeding results in five separate research papers (presented in chapter 4), which build on each other and reflect the advancement of knowledge throughout the overall research project. In a first step, possible effects of product-service transition on the business model of manufacturing firms need to be identified. To examine these effects, a business model conceptualization needs to be selected that allows for a detailed analysis and comparison of manufacturing firms' business models resulting from product-service transition. As chapter 2 shows, neither product-service transition literature nor business model literature provides a conclusive answer in this context. However, an integrative perspective on both research streams promises interesting insights. Therefore, the first two research papers that have been developed in the context of this thesis aim at conceptually linking insights from service research and business model literature. In doing so, the influence of a service-oriented business logic on the elements of a manufacturing firm's business model is analyzed against the background of a conceptual proceeding. Both papers employ the concept of a service-dominant logic that has been introduced by Vargo and Lusch (2004; 2008b). Although researchers (e.g. Ballantyne and Varey; 2006; Schembri, 2006; Stauss, 2005) criticize service-dominant logic for its lack of specificity and empirical validation, the basic reasoning of service-dominant logic is in line with literature on product-service transition. Neely (2008) already emphasizes that manufacturing firms need to facilitate mutual value creation processes among different stakeholders when implementing service-related strategies. Furthermore, more recent research (e.g. Kindström et al., 2013; Kowalkowski et al., 2012) also highlights the need to consider the underlying service-oriented mental model of

manufacturing firms in the context of product-service transition. Hence, utilizing the somewhat extreme perspective of service-dominant logic (e.g. employing a strong focus on value instead of differentiating between goods and services or focusing on joint value creation among various parties for the mutual benefit of all value creation partners) (Laudien and Daxböck, 2016b) can be useful to analyze whether product-service transition has an effect on the business model and how a manufacturing firm's transition toward service influences the design of its business model.

The first paper by Daxböck (2013) titled *"Value Co-creation as Precondition for the Development of a Service Business Model Canvas"* (see subchapter 4.1) draws on Osterwalder and Pigneur's (2004; 2010) business model concept. It clearly shows that business models of manufacturing firms need to be adjusted in order to account for the requirements that come along with a service-oriented business logic. However, the paper also demonstrates that the business model canvas (Osterwalder and Pigneur, 2010) is not fully appropriate to describe service-related business models of manufacturing firms as it suffers from three limitations that need to be considered when applying it in the context of academic studies on product-service transition. First, the possibility to analyze value creation processes that transcends the focal firm is limited when describing a business model according to the business model canvas. Although key partners and customer segments represent two business model building blocks (Osterwalder and Pigneur 2004; 2010), activities that occur on a network level are not fully explained by the model – especially customers are not regarded as network partners that comprise the potential to enhance the firm-external knowledge base. These activities are of utmost importance in the context of product-service transition as relational aspects of value creation need to be considered (Jaakkola and Hakanen, 2013; Storbacka, 2011). The second drawback of Osterwalder and Pigneur's (2004; 2010) business model conceptualization is the division of the business model into nine building blocks that comprise a variety of aspects related to the overall firm. Such an all-encompassing business model conceptualization makes it difficult to determine the boundaries of a particular business model (Zott and Amit, 2013) and thus to utilize the business model as a unit of analysis which allows to identify and compare the benefits of a specific manufacturing firm business model design. Third, as Morris et al. (2005) already argue, many business model conceptualizations lack a thorough theoretical foundation. This is also a drawback of the business model canvas. Of course, the business model canvas (Osterwalder and Pigneur, 2010) has been developed for practitioners and theoretical considerations are not a major

objective of the related publication. However, the original business model conceptualization, as it is discussed in the dissertation by Osterwalder (2004), is not clearly embedded in theories related to strategic management research. Although business model literature is reviewed intensively and certain aspects of strategy research (e.g. the resource-based view by Wernerfelt (1984)) are considered, the theoretical foundation of the business model conceptualization is rather weak.

To overcome the deficiencies identified related to the business model canvas and to find a more appropriate business model conceptualization, the second paper by Clauß, Laudien, and Daxböck (2014) titled *"Service-dominant Logic and the Business Model Concept: Toward a Conceptual Integration"* (see subchapter 4.2) employs Amit and Zott's (2001; see also Zott and Amit, 2010) understanding of business models. Thus, it provides insights how the three business model elements content, structure, and governance are re-designed by manufacturing firms that implement a service-oriented business logic. The basic findings of this paper are in line with the results by Daxböck (2013). The paper also shows that manufacturing firms need to adjust their business models considerably in order to shift their basic business logic toward service. However, the results of the second research paper also show that the business model configuration by Amit and Zott (2001) allows for a more detailed analysis of the distinct network perspective that is inherent in service-dominant logic. To achieve the extreme position of a service-dominant business logic, all three business model elements need to be changed due to the necessity to develop new service-related capabilities, to adjust organizational administrative structures so that they extend the organizational boundaries in order to facilitate network partner exchange, and to accordingly adopt governance mechanisms that allow for monitoring these exchanges. Hence, the business model conceptualization by Amit and Zott (2001; see also Zott and Amit, 2010) seems to be more appropriate in the research context of this thesis.

These first two papers already provide some interesting insights regarding the first and the second research objective of this thesis. The findings are reflected in propositions that are developed as main results of the two conceptual papers. In this context, it is important to explain the role of these propositions in this thesis. This thesis follows the basic understanding of propositions by Whetten (1989) and Bailey (2008). According to these authors, propositions are useful to present the theoretical position that is developed in the respective papers. They are general statements about concepts that are either newly developed

or drawn from extant literature. It is important to know that propositions are not regarded as synonym to hypotheses (as for instance proposed by Denzin (1970)). In contrast to hypotheses, propositions are not necessarily testable and therefore do not require measures (Bailey, 2008; Whetten, 1989). The development of such propositions is particularly helpful as this process forces the researcher to think about core arguments and the implications of a new or revised thinking (Whetten, 1989).

The first two papers employ a rather normative approach and discuss how manufacturing firms need to design their business models in order to benefit from service-related opportunities only on a conceptual level. Hence, the second step of the research project calls for empirical research in order to reflect as well as extend the core arguments of the conceptual findings. In this context, a research approach is necessary that allows for analyzing characteristics of manufacturing firms' business models in practice. Research questions that are derived from the main research objectives are how and why questions. Thus, qualitative research is appropriate as it enables the researcher to answer these types of questions (Anteby, Lifshitz, and Tushman, 2014). Moreover, qualitative research allows the researcher to dig deeper and uncover underlying mechanisms that help to explain decision making processes of individuals, teams, and organizations (Bluhm, Harmann, Lee, and Mitchell, 2011). Hence, with qualitative research a more detailed understanding on how product-service transition impacts business models of manufacturing firms can be provided. Furthermore, due to the novelty and complexity of the research objectives highlighted in chapter 1, existing theories cannot be directly transferred, which also calls for a qualitative research approach (Edmondson and McManus, 2007 Eisenhardt and Graebner, 2007). Demil et al. (2015) emphasize that theory-building is essential to advance business model research. Theorizing from qualitative research (e.g. case studies) also seems to be adequate in the context of product-service transition as contextualization (Welch, Piekkari, Plakoyiannaki, and Paavilainen-Mäntymäki, 2011) is necessary to allow for employing the more integrative, cross-functional perspective explained above. Hence, the three empirical studies that have been conducted in the context of this thesis make use of qualitative research designs. However, the different research questions of the three studies call for slightly different research approaches that vary in their basic understanding of case study research (see Welch et al. (2011) for an overview and a comparison of different case study methods). A detailed explanation of the nature of the respective research approach is provided in each of the three papers that present the result of the three qualitative-empirical studies.

Although the different research approaches of the three empirical papers resulted in slight differences regarding the sampling approaches, the case firms selected for the respective studies have common firm characteristics. Even though the standard industrial classification code categories vary, all manufacturing firms analyzed in this thesis are operating in a business-to-business setting. Their core offerings are capital-intensive investment goods. Furthermore, firms that are dependent on one key customer are not included into the sample. Suppliers in automotive industry, for example, are not suitable in the context of this thesis as they usually align their strategies with their powerful key customers. Thus, it is most likely that their business models are designed around their key customers as well. This non-random sampling approach allows for an information-oriented case selection process (Flyvbjerg, 2006). In qualitative research, data collection and data analysis is usually an iterative process (Gioia, Corley, and Hamilton, 2013). This allows for selecting extreme cases as well as critical cases (Eisenhardt and Graebner, 2007; Flyvbjerg, 2006; Yin, 2009) that help to clarify open questions and deeper causes. The number of cases selected for each single paper also varies. Eisenhardt (1989) explicitly suggests selecting no more than ten cases. However, as Yin (2009) argues, there is no optimal number of cases. Instead, it can be useful to continue collecting data as long as possible rival explanations are not fully explained. As a consequence of this sampling approach, it is possible to provide in-depth insights based on a limited number of observations. Of course, case study research does not allow for statistical generalizability – as quantitative, theory-testing research does. However, generalizing from case data is possible (Eisenhardt, 1989; Flyvbjerg, 2006; Yin, 2009), although the analytic generalization that results from case study research (Yin, 2009) implies that findings cannot be transferred universally, but are only valid in the context of similar theoretical concepts or principles.

Differences in the research approaches are also reflected in the use of propositions in the respective papers. Depending on the research objective, propositions guide the research process (Yin, 2009) on the one hand (as utilized in the fourth paper of this thesis). On the other hand, they help to summarize the findings and provide a roadmap for future research (Eisenhardt, 1989; Flyvbjerg, 2006; Gioia et al., 2013) (as utilized in the third paper of this thesis). Nevertheless, it is in general not necessary to formulate propositions in qualitative research (Gioia et al., 2013; Flyvbjerg, 2006). Visual representations can also be a helpful tool to highlight findings of qualitative research (Yin, 2009) (as utilized especially in the fifth paper of this thesis).

The third paper in this thesis, *"Understanding Determinants of Business Model Design in the Context of Product-Service Transition"* by Laudien and Daxböck (see subchapter 4.3) employs an abductive research approach as suggested by Dubois and Gadde (2002). In doing so, the authors are able to integrate prior knowledge and new qualitative-empirical data. In particular, this approach allows building on insights from the prior theoretical findings regarding Amit and Zott's (2001; see also Zott and Amit, 2010) business model understanding. In retrospective reflection of the previous two papers, it became clear that researchers need to be careful when applying the business model conceptualization by Amit and Zott (2001) to a manufacturing firm setting. As the second paper shows, the basic meta-model (the three design elements and four design themes) of Amit and Zott's (2001) business model conceptualization is suitable to analyze a manufacturing firm's product-service transition. Moreover, the business model conceptualization was already tested empirically (e.g. Zott and Amit, 2007; 2008). However, the specific conceptualization of the meta-model is still based on a business setting that is linked to high-tech firms or e-businesses. Although the underlying theoretical basis is not restricted to a particular business setting, the measurements of the four design themes that have been applied in previous studies cannot be adopted easily to a manufacturing firm setting. There is no theoretical evidence that the specifications of business model elements and the sources of value creation identified by Amit and Zott (2001) in an e-business setting also apply to business models of manufacturing firms in the context of product-service transition. Hence, the third paper employed the three business model elements of Amit and Zott's (2001; see also Zott and Amit, 2010) business model conceptualization as a basic framework to identify specifications of manufacturing firm business models. In doing so, it is possible to classify different types of business model configurations utilized in the context of product-service provision. Additionally, the results of the paper provide evidence that a manufacturing firm's business model design in the context of product-service transition is clearly determined by the manufacturing firm's service strategy. However, this service strategy does not depict a transition along a product-service continuum, but a combination of multidimensional aspects.

Although the third paper in this thesis does not employ a processual perspective on business model change influenced by manufacturing firms' product-service transition, it provides first indication that not all firms are able to implement an appropriate business model – either due to internal or external strategic misfit. To analyze these aspects in more detail, the fourth paper titled *"Path Dependence as a Barrier to Business Model Change in Manufacturing*

Firms: Insights from a Multiple-case Study" by Laudien and Daxböck (2016a) (see subchapter 4.4) employs a processual approach. The results of this study show that manufacturing firms' business model change processes are often affected by path dependence. This path dependence hinders or decelerates the implementation of a business model that is in line with the firms' respective service strategy. This paper extends the third paper as it examines reasons for implementing a particular business model design in more detail. It shows that strategies are not always realized by implementing a business models without any changes. Instead, business models affected by path dependence do not fully reflect the firm's strategy. Thus, the findings of this paper help to explain the strategic misfit that has been identified in the context of the study presented in paper three.

Paper three and paper four provide intriguing insights regarding characteristics of business models employed by manufacturing firms that pursue product-service transition as well as the change process involved in this context. However, the findings of these papers also raise new questions. In particular, the results point to the need to analyze the emergent or deliberate nature of the way how manufacturing firms design new business models in the context of product-service transition and how they implement these business model changes in more detail. Moreover, a more extensive analysis of antecedents of business model change becomes necessary. The fifth paper in this thesis *"Uncovering the Role of Network Partner Collaboration in Business Model Innovation Processes of Average Market Players"* by Laudien and Daxböck (see subchapter 4.5) tackles these questions with an inductive multiple-case study approach. In particular, it aims at understanding business model change processes of average market players. Analyzing firms in such a specific setting promises intriguing insights as this approach sheds light on a type of firm that is largely neglected by extant research. Average market players as a distinct type of firms are assumed to behave differently compared to their outperforming competitors. The process model that is developed as a result of this paper clearly shows that business model change of average market players is an incremental and emergent process. Furthermore, it points out that network partner collaboration is a crucial element for average market players to successfully – and deliberately – pursue business model innovation. Firms that are not able to learn and benefit from intensive network partner collaboration at best only improve single components of their business models. Other influence factors (e.g. industry, firm type, CEO background) seem to have no – or at least no relevant – affect on business model change processes of average

market player. This provides evidence that an average market position constitutes a firm characteristic that has a strong influence on the business model innovation process.

All in all, the papers in this thesis highlight the importance of (1) considering the manufacturing firm's basic business logic and the ways how value is created when examining service-related strategies of manufacturing firms; (2) integrating insights from business model literature and service research to analyze manufacturing firms' product-service transition; (3) employing the business model as a new unit of analysis that examines business activities on a level between the focal firm and the network level. All papers contribute to both literature streams – product-service transition literature and business model literature. However, it was necessary to shift the research focus over time in order to better understand the process of a manufacturing firm's transition toward an increased focus on service. Thus, while the first two papers place emphasis on analyzing aspects centered in the realm of service research, the more recent papers rather address aspects that are primarily discussed in business model literature.

4 Developing a Deeper Understanding of Product-Service Transition and its Influence on Business Model Design: A Paper-based Approach

4.1 Value Co-creation as Precondition for the Development of a Service Business Model Canvas[1]

Abstract

Environmental changes such as increasing competitive pressure and rising customer power force firms to rethink their way of doing business and to implement a service-oriented business logic. As a result, firms more and more aim at offering solutions instead of selling products in order to meet customer demands more effectively. This transition from a goods-oriented to a service-oriented logic depicts a fundamental change in the mental model underlying the business. Therefore, a redesign of a firm's business model is necessary. This paper analyzes the influence of a product-service transition on the business model canvas against the background of service-dominant logic. The paper analyzes how a service-dominant business logic affects the design of the nine building blocks of the business model canvas. Special emphasis is given to the aspect of value co-creation and the need to integrate customers as key partners in value creation processes. The result of this conceptual paper is a set of propositions that may serve as a basis for future empirical research.

Keywords: Business model canvas; service-dominant logic; value co-creation; customer integration.

4.1.1 Introduction

Firms recently face the challenge to cope with a business environment that is in a constant flux; global competition is increasing, product life cycles are becoming shorter and customer needs are changing frequently (Gummesson, 2007; Teece, 2010). Especially the rise of new

[1] This paper is a single-authored paper by Birgit Daxböck that is published in Studia Negotia: Daxböck, B. 2013. Value co-creation as precondition for the development of a service business model canvas. *Studia Negotia*, 58(4): 23-51. It is recommended to cite the original source of publication. The original publication is available at the following link: http://www.studia.ubbcluj.ro/download/pdf/823.pdf.

information and communication technology puts further pressure on firms to adapt their strategies to the changing business environment. On the one hand, information and communication technology has a major impact on manufacturing processes and product innovation (Osterwalder and Pigneur, 2004). On the other hand, information and communication technology also strongly influence customer behavior (Prahalad and Ramaswamy, 2004). Nowadays, suppliers as well as customers benefit from a widespread access to information and enhanced communication abilities. However, information and communication technology developments especially support a shift of power from suppliers to customers as they contribute to making product and service offerings more transparent and comparable (Kucuk and Krishnamurthy, 2007; Teece, 2010). Customers more and more claim voice related to product- and especially service-design (Chesbrough and Spohrer, 2006). Furthermore, they do not hesitate to share and discuss their experiences with products and services with others within widespread customer communities. Therefore, markets increasingly develop into forums where customers actively participate in value creation processes (Prahalad and Ramaswamy, 2002; 2004).

Offering standardized goods on the mass market is no longer a suitable option for many suppliers as customers increasingly seek customized solutions (Jaakkola and Hakanen, 2013; Moeller, 2008). As a consequence, even traditional manufacturing firms more and more follow recommendations of management literature to move downstream toward the customer (Wise and Baumgartner, 1999). In order to escape the menace of commoditization and to meet customer demand more effectively, they extend their product portfolios by adding services to their core product offerings (Gebauer et al., 2005; Neu and Brown, 2008; Oliva and Kallenberg, 2003). In doing so, firms are forced to adjust their basic business logic as not only the tangible product itself, but to a growing extent also unbundled service offerings that are tailored to customer needs considerably contribute to revenues and following profitability of a firm (Osterwalder and Pigneur, 2010). Hence, a firm has to develop a more customer-centric mindset to be able to deliver solutions to its customers (Galbraith, 2002; Kowalkowski, 2010; Ramirez, 1999). In this context, Vargo and Lusch (2004; 2008b) argue that firms need to overcome the old, mainly goods-dominant business logic (Mill, 1909; Say, 1821) and to replace it by a service-dominant logic (see also Vargo and Morgan, 2005). According to service-dominant logic, value is no longer created solely by the supplier. In contrast, an integration of the customer into the value creation process and thus a joint

creation of value is a necessary precondition that enables firms to meet customer demands (Grönroos, 2011b; Vargo and Lusch, 2004; 2008b).

In addition to redefining value propositions and value delivery processes, a firm moving towards a service-oriented business logic has to think about how to capture value from their new offerings (Teece, 2010). Otherwise, firms risk being trapped in the so-called service paradox (Gebauer et al., 2005). The service paradox is characterized by an increase of costs firms have to spend for additional service offerings that is not accompanied by corresponding higher revenues. As a consequence, a firm's whole value creation network has to be analyzed (Ng, Parry, Smith, Maull, and Briscoe, 2012). This means that firms changing their business logic need to consider not only value creation during production processes within their own value chain, but also the value that is realized during the consumption process of the customer (Grönroos, 2008; Vargo and Lusch, 2004). To consider internal as well as external value creation processes, the business model is a suitable unit of analysis. Business models not only explain internal activities of the focal firm, but also mirror activities performed by suppliers and customers (Zott et al., 2011). Following, firms need to adjust their business models to new market conditions and to the transformed business logic to be able to exploit the potential of services successfully. Nevertheless, it is difficult for firms do deal with this need for change as business models are quite fuzzy constructs and literature does up to now not provide a common understanding of business models and its basic elements (Zott et al., 2011).

The purpose of this paper is to employ a service-dominant logic perspective on the transition process from a goods-focused to a service-focused business model. To date researchers very often only describe specific service-focused business models (e.g. Johnson et al., 2008; Wise and Baumgartner, 1999). However, only a few studies explicitly discuss the transition to a service business model with a particular focus on value co-creation and customer integration (e.g. Frankenberger, Weiblen, and Gassmann, 2013; Kindström, 2010; Nenonen and Storbacka, 2010; Storbacka et al., 2013). In addition, these studies rather focus on specific aspects of service business models, but do not integrate business model concepts and service-dominant logic in a systematic way. Furthermore, it is necessary to address the influence of a product-service transition on particular elements of a business model. Understanding the elements that are relevant for a specific business logic and analyzing their relationships is essential for firms to identify the right measures to implement the new business model

(Osterwalder and Pigneur, 2004). Therefore, this paper aims at analyzing the necessary changes related to the transition from a product-oriented to a service-oriented business model. The basic research questions are: *(1) Which elements of traditional holistic goods-dominant business models have to be changed in which way to upgrade these business models to service business models? (2) How should a service-oriented business model be designed to facilitate customer integration and value co-creation?*

This paper contributes to business model literature and service-dominant logic literature by integrating the core elements of service-dominant logic into the business model canvas originally developed by Osterwalder and Pigneur (2010). In doing so, the paper provides a framework for the analysis of the effects of a growing service orientation on the way how firms do business. Furthermore, the paper gives first insights how to redesign business model building blocks to match the requirements of a service-oriented business logic.

4.1.2 Theoretical Background

Before discussing the need to integrate service aspects into business models in detail, a clarification of basic concepts and a brief explanation of the conceptual framework of this paper are necessary. Therefore, this chapter provides insights into service-dominant logic and gives information on the basic understanding of business models employed in this paper.

4.1.2.1 Service-dominant Logic

More and more manufacturing firms follow the suggestion given by management literature to shift the focus from producing goods towards providing solutions by integrating services in their offerings (Gebauer, 2008; Oliva and Kallenberg, 2003, Wise and Baumgartner, 1999). One benefit for firms refocusing on service activities is rooted in the fact that it is highly difficult to imitate intangible aspects of services. Furthermore, adding services to core products can be seen as a differentiation strategy which aims at attracting new customers and enhancing retention of the existing customer base (Bruhn and Georgi, 2006; Matthyssens and Vandenbempt, 2008). Additionally, the recent progress in information and communication technology allows for an increasing customer participation in value creation processes as customization of products becomes faster and cheaper (Prahalad and Ramaswamy, 2002). As a consequence, the traditional distinction between tangible goods and intangible services becomes more and more blurred (Grönroos, 2006; Gummesson, 2007; Lovelock and

Gummesson, 2004). Consequentially, firms need to develop new ways of value creation by continuously redesigning their relationships with customers and other business partners (Normann and Ramirez, 1993).

In this paper, the concept of service-dominant logic introduced by Vargo and Lusch (2004) is employed to overcome the somewhat outdated differentiation between products and services. Furthermore, service-dominant logic allows for looking at the transition of firms from being a producer to becoming a service provider from a new perspective. In contrast to the old goods-dominant logic, service-dominant logic does not differentiate between tangible and intangible outputs, but defines service (singular) as "…*the application of specialized competences […] through deeds, processes, and performances for the benefit of another entity or the entity itself."* (Vargo and Lusch, 2004: 2). This definition reflects the necessity to employ a completely new way of doing business to be able to successfully implement service-oriented strategies (Vargo and Lusch, 2008a). While goods-dominant logic focuses on the production output, service-dominant logic regards service as the fundamental base of exchange with goods merely being a distribution mechanism for service provision (Vargo and Lusch, 2004; 2008b)

Basically, the concept of service-dominant logic rests on ten foundational premises (Vargo and Lusch, 2006; 2008b), which can be consolidated into three core elements that enhance the general understanding of service explained above. First of all, the concept of *value-in-context* replaces the old goods-dominant logic concept of value-in-exchange (Vargo, 2009; Vargo, Lusch, Akaka, and He, 2010). This means that firms cannot deliver value, but only offer value propositions, which are evaluated exclusively by the beneficiary (the customer). Hence, firms need to understand the value of the customers' experience in using an offering instead of evaluating value according to the production process (Prahalad and Ramaswamy, 2004; Vargo and Lusch, 2004). In this context, service-dominant logic emphasizes the importance of collaborative processes resulting in a joint creation of value. The customer is no longer an exogenous variable, but integrated in a firm's value creation process (Vargo and Lusch, 2008a). In turn, the firm also interacts with the customer's value creation system. Therefore, firms' and customers' service systems form a network by multilaterally contributing to the value creation process resulting in at least temporal cooperation (Grönroos, 2011b; Lusch et al., 2010; Maglio, Vargo, Caswell, and Spohrer, 2009). As a consequence, value is always co-created and bound to the context of the network in which it arises.

This *network perspective* is the second core element of service-dominant logic and supersedes the old goods-dominant logic-related concept of the value chain. Against this background, a value network is defined as *"…a spontaneously sensing and responding spatial and temporal structure of largely loosely coupled value proposing social and economic actors interacting through institutions and technology, to: (1) co-produce service offerings, (2) exchange service offerings, and (3) co-create value…"* (Lusch et al., 2010: 20). Again, this sense and respond logic highlights the need to integrate the customer base and its resources into the value creation process (Lusch and Webster, 2011). On the one hand, a deep understanding of customer needs is required from a firm in order to develop adequate value propositions (Payne et al., 2008). On the other hand, integrating a customer's own network base can also extend the addressable knowledge base of accompany considerably (Prahalad and Ramaswamy, 2000).

The last main element is the specific *resource perspective* adopted by service-dominant logic. In this context, two types of resources have to be distinguished: operand (mainly tangible) resources and operant resources, meaning resources that produce an effect upon other resources. Operant resources are considered primary and superior to operand resources as they are usually dynamic and infinite (Constantin and Lusch, 1994; Vargo and Lusch, 2004). Therefore, they are more adaptive and less imitable than operand resources. Especially in dynamic environments adaptability, agility and constant learning are essential for firms to meet complex customer needs (Lusch et al., 2010). In this context, empowered customers are participating actively in value creation processes and thus become a new source of operant resources. Firms can benefit from the contribution of their customers if they are able to embrace the knowledge and skills customers possess and support customers' willingness to share experiences and to learn from the firm (Prahalad and Ramaswamy, 2000).

To date, service-dominant logic only provides some insights into how the customer's service system should be integrated so that firms can benefit from this new network configuration. Lusch et al. (2010) argue that the different members of value networks are linked by three major elements: (1) their competences, which are used to provide service for the other actors; (2) their collaborative relationships, which are based on rather non-coercive, informal governance mechanisms; and (3) information shared through common standards and protocols. However, the literature on service-dominant logic does not provide satisfying information on how the co-creation process exactly works. The development of value

propositions is explained as a learning process based on market-related sources of information such as financial metrics (Lusch, Vargo, and Wessels, 2008; Lusch et al., 2010). This market-based learning mechanism does not consider the need to integrate the customers' network into the value network to jointly create value. Further research is needed in order to deepen the understanding on activities and structures that enable value co-creation processes. Moreover, since the concept of service-dominant logic is not entirely theoretically founded and has not reached the state of a paradigm yet, a deeper analysis of the core elements is essential. Additionally, the concept is criticized because of its limited managerial implications (Achrol and Kotler, 2006; Ballantyne and Varey, 2006). Therefore, a more practice-oriented perspective on the process of value co-creation has to be taken into account. Nevertheless, research on service business model development can be strengthened by service-dominant logic's particular definition of service and its insights on value creation networks. Vice versa, illustrating the customer integration aspect within the business model can also support the development of service-dominant logic by clarifying the co-creation mechanisms.

4.1.2.2 Basics of Business Models

Since the mid-1990s, practitioners as well as researchers increasingly place emphasis on the concept of business models. Especially in times of increasing competition and severe pressure on profit margins, innovating the business model becomes a less time-consuming and less expensive alternative to product or process innovations (Amit and Zott, 2012; Chesbrough, 2010; Magretta, 2002; Teece, 2010). The product-service transition can be seen as a trigger of business model innovation. For example, Wise and Baumgartner (1999) identify four basic business model types that describe how firms integrate service offerings in their product portfolios. However, they do not explain the underlying processes of business model innovations in general, nor do they draw on the business model as a unit of analysis in particular.

Despite of the growing attention on business models in scientific research in the past 20 years, there is still a lack of definitional clarity (Zott et al., 2011). In general, business models can be understood as a blueprint of economic actions of firms (Osterwalder et al., 2005). They describe mechanisms to create, deliver and capture value (e.g. Afuah and Tucci, 2001; Chesbrough, 2007b; Osterwalder and Pigneur, 2010; Teece, 2010). However, recent research increasingly emphasizes the value creation aspect of business models. Moreover, network relations and collaborative value creation processes are considered in particular, even though

the traditional perspective of value creation through the focal firm does still prevail (Zott et al., 2011). In the context of this paper, business models are defined according to Osterwalder (2004: 15) as *"…a conceptual tool that contains a set of elements and their relationships and allows expressing the business logic of a specific firm. It is a description of the value a company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams."*

Similar to other researchers (e.g. Amit and Zott, 2001; Chesbrough and Rosenbaum, 2000; Teece, 2010; Timmers, 1998), Osterwalder (2004) conceptualizes a meta-model that includes specific business model elements (see also Osterwalder and Pigneur, 2004; 2010). However, the advantage of Osterwalder's (2004) understanding of the business model concept is that its definition already applies a network perspective on value creation. The main elements of Osterwalder's (2004) conceptualization – the so-called four main pillars – are (1) product (or product innovation), (2) customer interface, (3) infrastructure management and (4) financials. Thus, these pillars describe a firm's offerings, its target group, the way how the business operates and the profit a firm aims to achieve. In order to make the business model work, the four pillars need to be aligned with external forces such as competition, environmental change or customer demand (Osterwalder and Pigneur, 2004). Another point in favor of this model is that the four pillars of the business model are further decomposed into nine business model building blocks: value proposition, customer relationships, customer segments, channels, key partners, key activities, key resources as well as cost and revenue structure (for a detailed description see table 4.1–1).

Business model pillar	**Business model building block**	**Description**
Product	Value proposition	Describes the bundle of products and services that create value for a specific customer segment
Customer interface	Customer relationships	Describes the types of relationships a firm establishes with specific customer segments
	Customer segments	Defines the different groups of people or organizations an enterprise aims to reach and serve
	Channels	Describes how a firm communicates with and reaches its customer segments to deliver value propositions
Infrastructure management	Key partners	Describes the network of suppliers and partners that make the business model work
	Key activities	Describes the most important things a firm must do to make a business model work
	Key resources	Describes the most important assets required to make a business model work

Financial aspects	Cost structure	Describes all costs incurred to operate a business model
	Revenue structure	Represents the cash a firm generates from each customer segment

Table 4.1-1: Business model building blocks.
Source: Own illustration adapted from Osterwalder and Pigneur, 2010; Osterwalder et al., 2005.

This detailed fragmentation of the meta-model allows for an in-depth description of a firm's business model. This, in turn, helps managers to generate a common understanding of the model and to identify the most important drivers of their business model (Osterwalder and Pigneur, 2004). Most important, the single building blocks are not independent. They are interconnected and dependent on each other (see figure 4.1–1) (Osterwalder, 2004; Osterwalder and Pigneur, 2004). Changing one element leads inevitably to the necessity of adjusting other elements. Furthermore, by illustrating and mapping all building blocks and their interrelations, changes in the business model can be easily illustrated which makes the evolution of new strategic alternatives apparent (Osterwalder and Pigneur, 2004; 2010).

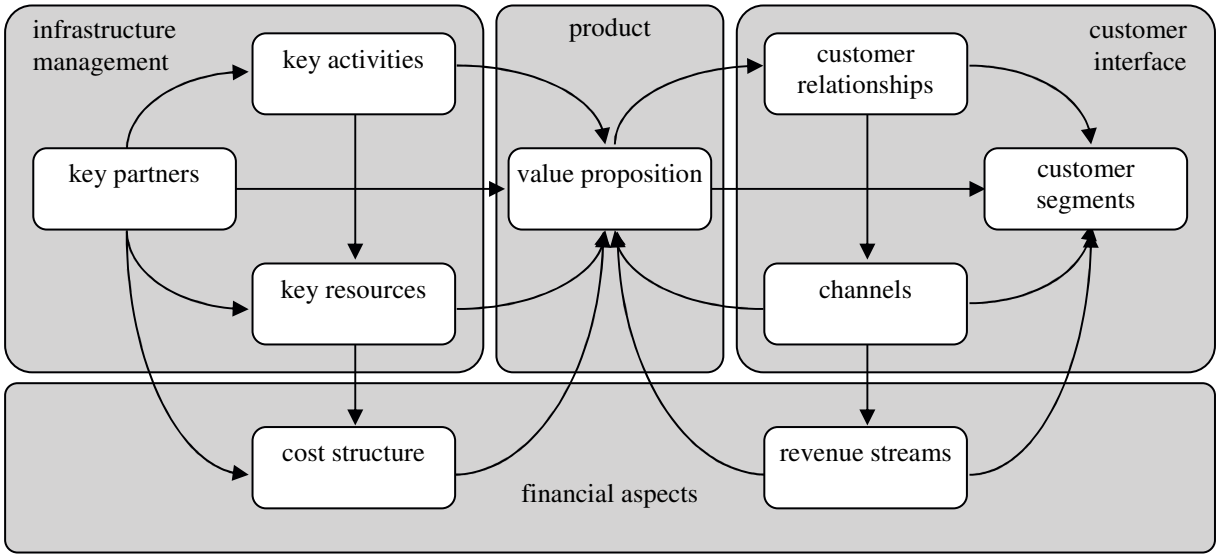

Figure 4.1-1: Business model building blocks and their interrelationships.
Source: Own illustration based on Osterwalder and Pigneur, 2004; 2010.

The original meta-model (Osterwalder, 2004; Osterwalder and Pigneur, 2004) was developed with a particular focus on e-businesses. However, Osterwalder and Pigneur (2010) updated the model later on in cooperation with over 400 practitioners. The goal was to create a meta-model – the so-called business model canvas – that allows managers to *"think through the business model"* (Osterwalder and Pigneur, 2010: 15). Furthermore, the business model canvas was applied and tested in a multitude of different firms and various industries. Thus,

another main advantage of the business model canvas is that it can generally be adapted to match diverse business settings (Osterwalder and Pigneur, 2010).

The need to improve a business model is on the one hand a coercive reaction to changes in a firm's business environment. On the other hand, managers can use a structured approach to proactively redesign specific business model building blocks. In this context, the reinvention of specific business model elements to deliver value in a new way (Lindgardt, Reeves, Stalk, and Deimler, 2009), or more general, the transition from an old business model to a new one (Osterwalder et al., 2005), is referred to as business model innovation. By analyzing the necessity to change the above mentioned business model building blocks according to service-dominant logic, such a structured approach to business model innovation can be pursued. To implement service-dominant logic these building blocks need to be aligned with the core elements of service-dominant logic. In doing so, necessary changes in the business model triggered by an increasing service-orientation of a firm can be identified and analyzed in detail.

Although the meta-model by Osterwalder and Pigneur (2004; 2010) has various advantages compared to alternative business model concepts, its development was mainly influenced by a rather goods-dominant thinking disregarding the need to co-create value with customers. Taking a closer look at the description of the single components, it has to be mentioned that not only the wording (e.g. deliver value to customers instead of creating value with customers) but also the basic understanding of exchange mechanisms (e.g. the role of partnerships in value chains instead of the integration of various service systems to one value network) is highly related to goods-dominant logic. At first glance, some concepts within the customer relationship block of the more recently developed business model canvas (Osterwalder and Pigneur, 2010) could be related to service-dominant logic. For example, they discuss co-creation or the utilization of customer communities as an element within the customer relationship block. However, a closer examination shows that co-creation is rather described as a type of customer-firm interaction or a part of customer relationship management, which suggests that the general underlying logic does not fully match service-dominant logic thinking.

4.1.3 Role of Value Co-creation in Business Models

The transition from a product-oriented to a service-oriented business logic requires a holistic change in the mental model underlying the whole business. As a consequence, even meta-models of the business model concept need to be adapted to adhere to the basic tenets of service-dominant logic. Against this background, it is necessary to examine adjustments that have to be made to the meta-model before analyzing the influence of service-dominant logic – and especially the aspect of value co-creation – on the business model building blocks and their interrelations.

4.1.3.1 Integrating Service-dominant Logic into the Business Model Canvas

A shift in the dominant logic of a firm (Prahalad and Bettis, 1995) goes along with a need for considerable changes within the whole firm (Grönroos, 2006). Especially the transition from a product- to a service-oriented business logic causes considerable managerial challenges (Oliva and Kallenberg, 2003). First of all, service business models tend to be more complex compared to mainly goods-focused business models as the traditional product focus is developed into a process focus of value co-creation (Lusch et al., 2010). In this context, firms actively need to facilitate the joint creation of value (Grönroos, 2011b) by establishing an infrastructure that allows for customer integration in value creation processes (Vargo et al., 2008). Second, firms need to develop specific competences to adjust the customer interface adequately in order to recognize and fulfill changing customer needs (Karpen, Bove, and Lukas, 2012; Lusch et al., 2007). Third, customer relationships have to be redefined to live up to the network perspective of service-dominant logic. Summing up, managing the value creation network is vital to organizational survival of service-oriented firms. Even from a goods-dominant logic perspective, the integration of the customer as an external factor into the service process has always been an essential prerequisite of service provision (Bruhn and Georgi, 2006). Service-dominant logic intensifies the importance of the customer relationship as it forces a firm to jointly create value with its customers. Therefore, transaction relationships need to be replaced by newly developed value creation partnerships (Lusch et al., 2010). This paradigm shift of the business logic results in the need to change the firm's activity system – the business model – fundamentally (Ng et al., 2012).

Many business model conceptualizations already indicate an interplay between firm-internal structures and processes with external network partners and customers (e.g. Chesbrough and

Rosenbloom, 2002; Morris, et al., 2005; Osterwalder and Pigneur, 2004; 2010). Furthermore, researchers often emphasize a customer-centric perspective on business models or even address value co-creation (Frankenberger, Weiblen, and Gassmann, 2013). Additionally, open business models focus on external resources in order to facilitate value creation processes (e.g. Chesbrough, 2006; 2007b). However, when speaking about customer centricity scholars usually refer to strategies such as customer orientation or relationship management which were developed based on goods-dominant logic (Vargo and Lusch, 2008a). Open business models on the other hand usually focus on opening research and development or intellectual property management to external contributors and do not include long-term partnerships in any other ways (Frankenberger, Weiblen and Gassmann, 2013). Hence, instead of a one-sided perspective (supplier focus or customer focus), a balanced centricity including all members of the value network has to be considered in the business model conceptualization (Gummesson, 2008).

As discussed before, the business model canvas (Osterwalder and Pigneur, 2010) does not explicitly illustrate value co-creation processes according to service-dominant logic. One way to further emphasize the co-creation aspect within the business model would be to change the product related block of value proposition to a process related aspect of value co-creation. However, altering the meta-model's building blocks is not helpful. First, changing one building block would result in changes of all other building blocks. Nevertheless, the customer interface would still be inadequate in regard to the core elements of service-dominant logic, as customer segments would still be regarded as "targets" instead of partners for value co-creation. In order to fulfill requirements related to service-dominant logic, a more explicit integration of customers is strongly needed. Second, from a firm's perspective the focus on value propositions is still important. Even though firms are – according to service-dominant logic – not able to create value by themselves, they need to make value propositions in order to initiate value co-creation processes with their customers.

Following, these value propositions are exclusively evaluated by the customer (Vargo and Lusch 2004; 2008b). As a consequence, value is jointly created by all actors within the value networks through exchange of resources and knowledge. These networks are viewed as open systems, which allow for constant learning and adaption to a changing environment (Lusch et al., 2010). Osterwalder and Pigneur's (2004) meta-model does not account for such close relationships between the focal firm and the customer, nor does the business model canvas

(Osterwalder and Pigneur, 2010) do so. To date, feedback from the customer base to the focal firm is only indicated by the link between the revenue flows and the value proposition block. In general, this consideration is in line with the learning mechanism via financial metrics proposed by Lusch et al. (2008). However, as stated before, a more direct transfer of information and knowledge is necessary to successfully implement a service-dominant business logic. To facilitate resource transfers from customers to the focal firm, it is necessary to perceive customers not only as "targets", but as key partners. According to Osterwalder and Pigneur (2004; 2010), key partners can be used to acquire particular resources. By linking the customer segments to the key partners building block and thus creating an indirect feedback loop from the value proposition block back to the infrastructure management pillar, it is possible to include the co-creation aspect into the model while still focusing on the firm perspective of value proposition (see figure 4.1–2).

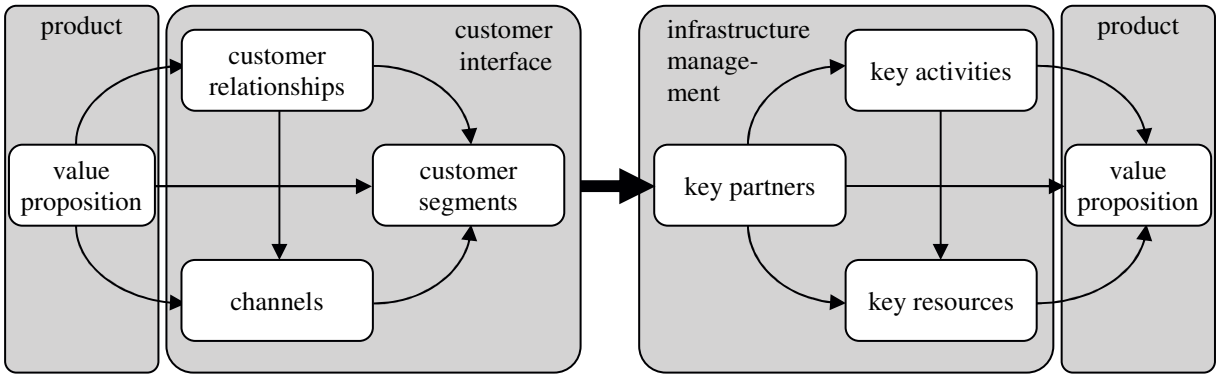

Figure 4.1-2: Interrelationship between customer interface and infrastructure management.
Source: Own illustration.

4.1.3.2 Development of Research Propositions

Proactively changing a business model requires a structured approach. Mapping and linking the underlying processes and elements by using a meta-model and changing each one of them is a suitable course of action (Osterwalder, 2004; Scott-Kemmis, 2012). Taking a look at the meta-model, the transition from a goods-oriented to a service-oriented focus might influence each single business model building block and firms changing their business models toward service-oriented solutions need to make changes in multiple dimensions as various business model elements are interrelated and interdependent (Storbacka et al., 2013).

Value proposition. A value proposition includes quantitative (e.g. price) as well as qualitative elements (e.g. customer experience) (Osterwalder and Pigneur, 2010). The definition of a

particular value proposition of service-oriented firm as well as transition paths from a goods orientation to a service orientation will vary depending on the firm's context-specific strategy (Storbacka et al., 2013). However, to implement service-dominant logic accordingly, firms need to understand that value propositions based on service-dominant logic are rather value-supporting processes. Not only the exchange of goods and service is of importance, but also the exchange of information and other operant resources (Lusch et al., 2010). Furthermore, customer-firm interactions are necessary to enable customers to create value-in-context in their everyday practice (Grönroos, 2008). Additionally, firms need to be aware of the fact that they serve as performance providers or problem solvers and therefore have to develop a deep understanding of a customer's needs (Storbacka et al., 2013). This is not only true in business-to-business aspects, where intense relationships between supplier and customer can be observed frequently (Ballantyne, 2004). A stronger focus on customers' experiences with products and services during the usage process is also increasingly relevant in business-to-customers aspects (Prahalad and Ramaswamy, 2004).

Proposition 1a: Implementing service-dominant logic enhances the service focus and reduces the product focus of the value proposition.

Proposition 1b: Firms implementing service-dominant logic are more interested in the value created by customers during the usage process of an offering than firms that remain in a goods-dominant business logic.

Key activities. Similar to the value propositions block, the key activities a firm performs not only depend on the service focus, but also on general factors such as market strategy or industry focus. However, firms focusing on service-oriented solutions will rather follow the "value shop" concept to organize their value creation activities (Osterwalder and Pigneur, 2004). This means that they will focus on detecting and fulfilling customers' needs and thus on problem discovery and problem solving activities (Osterwalder and Pigneur, 2004; 2010). The main business focus shifts from being a producer to being a provider (Storbacka et al., 2013). To implement service-dominant logic, firms need to support the value creation processes of their customer and thus, serve as value facilitators. As a consequence, they need to create opportunities to develop interactions with customers (Grönroos, 2008) in order to engage in an active dialog (Prahalad and Ramaswamy, 2000).

Proposition 2a: Implementing service-dominant logic changes the role of a firm from being a producer of offerings to being a provider of offerings.

Proposition 2b: Implementing service-dominant logic enhances the need for interaction with customers.

Key resources. The definition of service according to service-dominant logic refers to the process of using one's resources for the benefit of another entity. In this context, all economic actors are resource integrators (Vargo and Lusch, 2004; 2008b). The concept of value-in-context implies that customers not only integrate resources supplied by the firm in their value creation process, but also consider resources at their own disposal or sourced from other partners (Lusch and Webster, 2011). The whole value network aims at co-creating valuable solutions to mutually improve all network partners' well-being (Vargo and Lusch, 2011). In this context, a special emphasis has to be placed on operant resources such as knowledge and skills. Moreover, special capabilities are necessary to develop adequate value propositions (Osterwalder and Pigneur, 2004) as well as to actively manage the value co-creation process (Karpen et al. (2012) discuss in this context the role of specific interaction capabilities). To develop and use such operant resources effectively, learning mechanisms and knowledge transfer from customers to the firm (and vice-versa) are of importance (Madhavaram and Hunt, 2008). Firms need to relate knowledge management activities to value co-creation processes instead of relying on information technology-enabled processes (Payne et al., 2008). Therefore, the ability to learn directly from the customer base and from other network partners becomes more important (Lusch et al., 2010). Furthermore, as the product-service transition is a rather stepwise approach (Storbacka et al., 2013) firms utilize experimentation trial-and-error learning to change elements of their business models (Chesbrough, 2010; Sosna et al., 2010).

Proposition 3a: Firms implementing service-dominant logic develop specific interaction capabilities facilitating the co-creation of value.

Proposition 3b: Designing value propositions is related to a feedback learning mechanism based on operant resources provided by the customer base.

Customer segments. Implementing service-dominant logic also has an influence on considerations regarding customer segmentation. However, traditional criteria for customer

segmentation such as requirements regarding different distribution channels, prices, offerings, types of relationships as well as the varying profitability of different customers (Osterwalder and Pigneur, 2010) are still relevant. Furthermore, a firm's decision whether to serve, for example, the mass market or to follow a niche market strategy might not be influenced by the product-service transition at all. Service-dominant logic is not only applicable to niche market strategies or business-to-business settings, in which close relationships are established with a manageable amount of customers. In contrast, service-dominant logic argues that strategies from business-to-business settings can be translated to business-to-customers settings (Vargo and Lusch, 2008a; 2011). Customers are an essential source of operant resources – in all different settings (e.g. Lusch et al., 2010; Prahalad and Ramaswamy, 2000). Of course, different customers have a different willingness to participate in co-creation processes (Rosenbaum and Massiah, 2007; Yi and Gong, 2013) as well as different skills, which also determine the perceived value for a customer (Prahalad and Ramaswamy, 2000). As a consequence, for service-oriented firms the type of relationship will be the most important segmentation criteria. On the one hand, firms need to manage customer diversity and facilitate value co-creation for customers with a different degree of sophistication (Prahalad and Ramaswamy, 2000). On the other hand, the integration of specific customers in order to gain access to operant resources is regarded as a strategic choice (Lusch and Webster, 2011). Hence, firms should focus on integrating key customers, who value a firm's value propositions and are willing to provide operant resources in return.

Proposition 4: Firms implementing service-dominant logic segment key customers based on their willingness and ability to share information.

Key partners. Osterwalder and Pigneur's (2004) meta-model directly links the building blocks "key resources" and "key partnerships". Besides the optimization of operations and processes and the reduction of risk, the acquisition of specific resources is one major reason for firms to engage in partnerships. Against this background, Osterwalder and Pigneur (2010) distinguish between four types of relationships: strategic alliances, coopetition, joint ventures and buyer-supplier relationships to assure reliable supplies. By employing service-dominant logic, firms have to further consider the importance of operant resources provided by the customer such as market-related knowledge (Madhavaram and Hunt, 2008). Furthermore, to facilitate experiential learning and thus the constant improvement of value propositions, feedback loops with all stakeholders are necessary to acquire knowledge about customers'

needs and to learn how to meet them. To do so, a two-way information flow with customers as well as with all other stakeholders has to be established (Lusch and Webster, 2011). Hence, customers' service systems represent valuable key partners and need to be integrated with a firm's existing partner network. Moreover, it can be assumed that value network partners are linked more closely and become more dependent upon each other (Frankenberger, Weiblen, and Gassmann, 2013; Storbacka et al., 2013).

Proposition 5a: Firms implementing service-dominant logic integrate customers as well as other network partners to gain access to specific service capabilities.

Proposition 5b: Firms implementing service-dominant logic have closer relationships with their value network partners.

Customer relationships. As customers are integrated in a firm's partner network, customer relationships play a major role in business models that are based on service-dominant logic. Value is (co-)created when customers interact with the resources and capabilities provided by a relationship with a supplier as well as by other actors within the value network (Lusch and Webster, 2011; Vargo and Lusch, 2004; 2008). While Osterwalder and Pigneur (2010) relate this building block to different types of relationships (e.g. direct, personal assistance vs. indirect relationships such as self-service), in this paper the nature of the relationship is emphasized. According to service-dominant logic, relationships should be beneficial for all involved parties to be in line with the specific definition of service. Hence, firms need to establish a dialog of equals with their customers (Prahalad and Ramaswamy, 2000) and they need to ensure that the acquisition of resources through customer relations does not lead to a one-sided exploitation of the customer's knowledge base. Negative examples would be specific open innovation projects, where customers surrender their property rights without receiving value in return (Kozinets, Hemetsberger, and Schau, 2008; Prahalad and Ramaswamy, 2004). Hence, customer-supplier relationships require multi-directional linkages, while each actor influences the value creation of the other (Grönroos, 2008). Instead of a rather hierarchical value chain perspective with firms "targeting" customers in the market, customer relationships based on service-dominant logic become more heterarchic (Hedlund, 1986; 1993) resulting in collaborative relationships of all partners within the value network and in symmetrical exchange of information and other operant resources (Kowalkowski, 2010).

Proposition 6: Firms implementing service-dominant logic facilitate multi-directional value creation activities that enable customers to interact with other network partners on eye level.

Channels. Channels connect the value propositions of a firm with the customer segment and reflect all possible interaction points between suppliers and customers (Osterwalder and Pigneur, 2004). Originally, the building block "channels" is rather related to distribution channels and focuses on the delivery of value to customers. However, this paper goes further and interprets channels as interaction mechanisms, which not only allow for distributing goods and services to customers, but which facilitate the joint creation of value. To employ service-dominant logic successfully, firms need to establish such interaction channels actively and thus encourage the reciprocal exchange of information and other resources (Grönroos and Ravald, 2011).

Of course, this consideration is strongly linked to the customer relationship aspect of the business model. Even though an integration of customers is a prerequisite of value co-creation, customer relationships do not necessarily need to be direct. To be able to manage the complex relationships within service business models, firms already heavily rely on information and communication technology. This provides a virtual platform for a close integration of customers and suppliers into value creation networks (Tuunanen, Myers, and Cassab, 2010) which seems to be crucial for the success of the adjusted or newly developed business model. Moreover, technology is an enabler to liquefy information, meaning the separation of information from its physical form. Therefore, information can flow more easily from one entity to another. By using channels based on information and communication technology, the knowledge transfer from customers to the firm can be facilitated. In turn, the firm is able to constantly reconfigure its resources and thus to improve its ability to offer more adequate value proposition (Lusch et al., 2010).

Proposition 7a: Channels based on information and communication technology enhance the exchange of information and facilitate the co-creation of value.

Service delivery is also more and more supported by information and communication technology (Belvedere, Grando, and Bielli, 2013). With advancements of information and communication technology in the mass market, customer acceptance of digitized services increases even in the business-to-customers market (Tuunanen et al., 2010). While

technology-generated self-service has usually decreased the personal interaction, today's information and communication technology enables interpersonal exchanges similar to face-to-face contact (Breidbach, Kolb, and Srinivasan, 2013) and allows for a more personalized communication at reasonable costs (Osterwalder and Pigneur, 2004). Therefore, developments in information and communication technology change the characteristics of customer relationships and exchange mechanisms as it facilitates the coordination of diverse partners within the value network (Davis, Spohrer, and Maglio, 2011; Osterwalder and Pigneur, 2004). On the one hand, information and communication technology changes the balance of market power in favor of customers due to enhanced information access, increased transparency and the ability to exchange information within large online-customer communities. Today, customers are even able to create value for themselves (e.g. customers-to-customers markets). Hence, empowered customers try to capitalize on their improved position by gaining a stronger influence on market exchange processes (Kucuc and Krishnamurthy, 2007; Prahalad and Ramaswamy, 2004; Steward and Pavlou, 2002). On the other hand, firms can stimulate the customers' willingness to participate in the value creation process and use the customer's contribution to their own benefit. By treating customers at an eye's level and rewarding them for their involvement, specific tasks can be transferred to the customer base. However, firms need to provide customers with specific tools or establish common standards to facilitate knowledge transfer and value co-creation (Briscoe, Keränen, and Parry, 2012; Lusch et al., 2010).

Proposition 7b: Empowered customers are willing to participate in value creation based on information and communication technology as long as their participation enhances their own value-in-context.

Proposition 7c: To benefit from the use of channels based on information and communication technology, firms establish common standards and instruct customers in using them.

Cost structure and revenue stream. The transition from a product- to a service-oriented business logic influences financial streams as offering services can provide a more stable source of revenues as extensive investments in tangible goods are usually more dependent on economic cycles (Oliva and Kallenberg, 2003; Wise and Baumgartner, 1999). For example, Rolls Royce changed its airline business from a goods-dominant logic to the provision of service when offering leasing contracts instead of selling engines (Ng et al., 2012). However,

the product-service transition does not necessarily result in service-dominant thinking (Kowalkowski, 2010). Not only lack of organizational arrangements supporting the transition but also cognitive limitations of managers increase the risk of being caught by the service paradox (Gebauer et al., 2005). As long as the customer remains an exogenous variable in the value creation process, firms still apply goods-dominant logic even when offering intangible goods (Lusch et al., 2007; Vargo and Lusch, 2008a). Nevertheless, in the example of Rolls Royce the transition not only addresses more continuous revenue streams and a solution-oriented activity focus, but also the improvement of customer utility (offering leasing contracts to ensure the long-term efficiency of airplanes). The value proposition needs to fit the customer's capabilities and resources in order to achieve a high value-in-context (Ng et al., 2012). To achieve high revenues, firms need to change their mental model.

Proposition 8a: Firms implementing service-dominant logic are affected by an increase of costs.

Proposition 8b: Firms implementing service-dominant logic are able to realize an increase of revenues that is higher than the increase of costs.

4.1.4 Conclusion, Limitations and Outlook

This paper examines how a growing service-orientation affects the business model design in manufacturing firms. In this context, the business model canvas of Osterwalder and Pigneur (2004; 2010) serves as overall theoretical framework for this paper. Insights on how business models need to be redesigned can be derived from the concept of service-dominant logic (Vargo and Lusch, 2004; 2008b). By discussing three major aspects of service-dominant logic, value-in-context as well as service-dominant logic's specific network and resource perspectives, insights are provided that a service-oriented business logic substantially affects all nine business model building blocks of Osterwalder and Pigneur's (2004; 2010) business model conceptualization, regardless what kind of service offerings are involved in particular.

What clearly distinguishes service-dominant logic from goods-dominant logic is that a reciprocal provision of service supersedes the provision of – either tangible or intangible – goods (Vargo and Lusch, 2008a) while the focus is shifted from exchange to interactions (Grönroos, 2006). Integrating and supporting customers to facilitate their resource integration and value co-creation processes within the network is the main challenge for a truly service-

dominant business model (Lusch and Webster, 2008). Especially the integration of the customer base in the value creation process plays a central role to effectively accomplish the transition towards a service-oriented business logic. As a consequence, adaptations of the meta-model by Osterwalder and Pigneur (2004; 2010) are necessary in order to display the role of the customer as a provider of operant resources in the business model. A direct link from the customer segments building block to the key partners block illustrates this interrelationship. Following, the propositions can be understood as an attempt to portray the influence of service-dominant logic on each single business model building block. Most notably, the propositions indicate that all nine business model building blocks are affected by an implementation of a service-oriented business logic. Of course, an integration of customers in value creation processes is the most fundamental aspect of the new business model. Nevertheless, due to the interdependencies of building blocks changes in the customer interface pillar result in the need to adjust other building blocks as well.

This research provides only a first attempt to describe the development of service-oriented business models. However, due to its conceptual nature this paper may lack explanatory power. Especially the intensity of modifications in each single business model building block cannot be explained within this paper. It can be assumed that the design of a specific business model is also dependent on particular context-related circumstances. This aspect was not considered in this research. Moreover, this paper does not explain precisely how firms can establish service-oriented business models in practice. Hence, detailed research on specific means to configure business models especially in order to apply the new perspective on customer relations is still necessary. Nevertheless, newness and complexity of the research question gave reason for following a more exploratory research approach.

Several interesting and important implications for future research can be highlighted. Especially the need for further empirical research has to be pointed out. First of all, a more detailed analysis of specific influences of service-dominant logic on the business model elements in business practice is necessary. This could be achieved by qualitative research – for example in-depth interviews with managers that already implemented service-dominant business models. Second, the question arises which service related capabilities need to be developed by firms that increase their service focus. Again, this can be answered by qualitative research. Nevertheless, besides focusing on a firm perspective of service capabilities it could also be of interest to gain insights into the customers' point of view.

Which expectations do customers have related to value propositions? In other words, which service-related capabilities are demanded by customers? Furthermore, the customers' opinion may also be of relevance related to the co-creation aspect of service-dominant logic. Customer surveys could analyze the willingness of customers to participate in the co-creation of value. It might also be interesting to further examine customers' perspectives on value creation. What benefits can customers gain from value propositions? Is there a gap between the value-in-context intended by the service provider and the value-in context perceived by the customers? Either qualitative or quantitative research could be useful to answer these questions. The addressed topics for future research are only a few issues that emerge from this research. Both, service-dominant logic as well as research related to the concept of business models can be strengthened by an integrative approach. Hence, future research focusing the research topic addressed in this paper is highly appreciated.

4.2 Service-dominant Logic and the Business Model Concept: Toward a Conceptual Integration[2]

Abstract

Firms are recently affected by an ongoing change of customer behavior. Customers are no longer solely interested in product offerings but call for a provision of service solutions that accompany these offerings. This development forces firms to rethink their basic business logic by paying more attention to the crucial service aspect. This change goes along with a need for firms to redefine their idea of how to create and capture value. Against this background, we ask: How does an increased focus on service influence a firm's business model? We examine this question based on the service-dominant logic concept as well as the business model concept and discuss possibilities how to adapt the business model to a service-dominant business logic. As a result, we develop a set of propositions describing the influence of a firm's service-dominant business logic on basic elements of a firm's business model. Our research shows that a fundamental re-design of the business model is necessary to successfully implement service-dominant logic.

Keywords: Service-dominant logic; business model; value co-creation; customer integration.

4.2.1 Introduction

In the 21st century value chains have already undergone and still undergo a considerable change. Due to the integration of national markets, shorter product-lifecycles, and an enhanced use of information and communication technology (Prahalad and Ramaswamy, 2002; Teece, 2010), firms have to deal with a changing customer role. As a result, firms are forced to re-organize value chain activities in order to be able to match the new customer driven market needs. This triggers a need for firms to adjust their business model.

To gain a broader scope of action and to enhance flexibility, many firms extend their portfolio of offerings by adding service elements to ensure customer retention (Gebauer et al., 2005;

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Oliva and Kallenberg, 2003). From a traditional perspective, firms distinguish between a knowledgeable, experienced, and innovative supplier and a passive, inexperienced customer who is not embedded into value creation processes but only consumes value (Ramirez, 1999; Vargo and Lusch, 2004). Consequently, the traditional business logic that focuses on production has to be re-defined, as it does not allow for an integration of a customer perspective in the process of value creation.

The service-dominant logic concept (Lusch et al., 2007; Vargo and Lusch, 2004; 2008b) helps to better understand the transition of firms from solely focusing on selling goods to aiming at providing integrated service solutions. Although the service-dominant logic concept suffers from a lack of rigidity and is by now at least not fully empirically supported (Achrol and Kotler, 2006; Grönroos, 2011b), it is helpful for understanding the service transition process as it overcomes the narrow goods-focused understanding of value creation and allows for integrating a customer perspective in value creation activities. Not surprisingly, the transition of the basic business logic from a goods-dominant logic to service-dominant logic goes along with a growing importance of customer-oriented thinking (Kowalkowski, 2010) and an integration of the customer into long-term service relationships that serve as a necessary framework for value co-creation (Vargo and Lusch, 2004). Furthermore, service-dominant logic highlights that value creation processes are not only linked to the firm level but are influenced by external value creation networks. However, only few firms successfully exploit the profit potential of enhanced, more service-focused value creation networks (Gebauer et al., 2005; Oliva and Kallenberg, 2003). This is not surprising as the transition from a product-oriented to a service-oriented business model not only requires re-evaluating the value propositions, but also to think about how to design adequate processes for service co-creation and resource integration between the firm and its customers. Thus, a holistic, system-based analysis of the value-creating space, namely the firm's business model (Ng and Briscoe, 2012), is required. Without adapting the business model to the employed business logic, a firm fails either to make adequate value propositions, or to capture value from customer-directed offerings (Teece, 2010).

From a research perspective, recently the interest in business models virtually exploded (Chesbrough, 2010; Zott et al., 2011). As many successful practical examples demonstrate the competitive potential of new business models (Johnson, 2010), the business model as unit of analysis made its way into innovation and management research. Although the adoption of

innovative business models by firms has already been recognized in business research (Schneider and Spieth, 2013; Teece, 2010), it is only recently that the scale and speed at which innovative business models are diffusing into business practice has attracted the attention of scholars and practitioners (Massa and Tucci, 2014). Research on business models already covers aspects of the firms' interaction with its environment. Studies especially cover the development of open business models (Chanal and Caron-Fasan, 2010; Chesbrough, 2007a), customer value co-creation (Nenonen and Storbacka, 2010; Plé, Lecocq, and Angot, 2010; Storbacka, Frow, Nenonen, and Payne, 2012), or the role of networks within new business models (Calia, Guerrini, and Moura, 2007; Maglio and Spohrer, 2013).

Although previous studies have addressed service innovations or even the transition from product- to service-based business models (Kindström, 2010), until now, no systematic concept that integrates the holistic view on a firm's business model and the premises of service-dominant logic has been developed. As changes in a firm's extant business model can be regarded as a prerequisite for a successful adaption of service-oriented strategies (Karpen et al., 2012), we address this striking research gap and provide a concept that integrates the premises of service-dominant logic thinking into the business model concept. We aim at answering the research questions: *(1) Does a transition from goods-dominant logic to service-dominant logic trigger a necessity to adjust the design of business models? (2) How should the elements of a business model be re-designed to support the implementation of a service-dominant business logic?* Our paper addresses these questions conceptually. First, the literature on service-dominant logic and business models is reviewed separately in order to provide a basic understanding of these concepts. Second, we reflect each dimension of the business model concept developed by Amit and Zott (2001) to highlight needs for change in case of transferring goods-dominant to service-dominant business models. Against this background, we develop a set of propositions that give first insights into the design elements of service-oriented business models in general. We close with a discussion of our findings and a presentation of implications for management and research.

4.2.2 Conceptual Background

To be able to discuss consequences of service-dominant logic for business model design, a clarification of basic concepts is necessary. Therefore, we provide insights into service-

dominant logic by explaining the main elements of this train of thoughts and give information on our basic understanding of business models.

4.2.2.1 Service-dominant Logic

Practitioners as well as researchers are well aware of the increasing strategic importance of services and management literature emphasizes the need to refocus firm activities to a more service-oriented perspective (Gebauer et al., 2005; Karpen et al., 2012; Schneider, Spieth, and Clauß, 2013). Coevally, service-dominant logic introduced by Vargo and Lusch (2004) gains more and more interest within marketing literature. Service-dominant logic also emphasizes the importance of an increased service-focus. However, the underlying, still goods-centered rationale to approach and analyze the transition process addressed above is scrutinized (Vargo and Lusch, 2008a). According to service-dominant logic reasoning, service-orientation is much more than an increased emphasis on services. Competing in the field of service forces firms to abandon the old industrial or goods-dominant logic and to employ a new service-oriented paradigm as basic strategic logic (Lusch et al., 2007). Therefore, service-dominant logic requires an entirely different way of doing business.

Goods-dominant logic focuses on the value-chain concept and assumes that products or services are endued with value during the production process (Vargo and Lusch, 2008a). After manufacturing is completed at the very end of the value chain, the contact with the customer is limited to the scope of a single transaction (Vargo and Lusch, 2004). When the customer is in possession of the good, its value inevitably decreases through wear and tear. Consumption in this regard is seen as a destruction of value (Vargo and Lusch, 2008a). Hence, the aim of the firm's value creation process is to standardize products and processes in order to be as efficient as possible and to maximize profit or to sustain competitive positions. Transitional concepts such as integrating services to core products (c.f. the product-service continuum by Oliva and Kallenberg (2003)) or more customer-centered perspectives which aim at offering solutions instead of tangible products (Galbraith, 2002; Matthyssens and Vandenbempt, 2008)) still view customers as an exogenous variable in the value creation process (Lusch et al., 2007; Vargo and Lusch, 2008a). Services are usually defined as intangible units of outputs. They remain to be mere, somehow inferior add-ons to core products (Kowalkowski, 2010).

In contrast, service-dominant logic takes a comprehensive and fundamentally different lens on how business processes should be seen and carried out. Based on ten foundational premises (FPs) service-dominant logic not only represents a shift in the type of basic firm offerings, but also determines a completely different mind-set compared to goods-dominant logic (Vargo and Lusch, 2008a).

Service-dominant Thinking: Service Focus	Value Driver: Value-in-context	Focus on Operant Resources	Central Role of Networks
▪ Service is the fundamental basis of exchange (FP1) ▪ Goods are distribution mechanisms (platforms) for service provision (FP3) ▪ All economies are service economies (FP5)	▪ Indirect exchange masks the fundamental basis of exchange (FP2) ▪ Firms cannot deliver value but only offer value propositions (FP7) ▪ Value is always uniquely and phenomenological determined by the beneficiary (FP10)	▪ Service requires the application of operant (instead of operand) resources (knowledge and skills) (FP1) ▪ Operant resources are the fundamental source of competitive advantage (FP4) ▪ All social and economic actors are resource integrators (FP9)	▪ Customers are always co-creators of value (FP6) ▪ A service-centered view is inherently customer oriented and relational (FP8) ▪ Context of value creation is exchange of actors within a service network (implied by FP 1 and FP9)

Table 4.2-1: Main elements and foundational premises of service-dominant logic.
Source: Own illustration based on Vargo and Lusch (2008b: 7).

The foundational premises reflect the basic elements of service-dominant logic thinking, which can be subsumed in four interrelated and recurring categories (see table 4.2–1). First of all, service (singular) is seen as the fundamental basis of exchange and defined as *"… the application of specialized competences […] through deeds, processes, and performances for the benefit of another entity or the entity itself."* (Vargo and Lusch, 2004: 2). In this context, service-dominant logic does not focus on the differences between goods and services as units of output, but considers their relationship, whereas goods derive their value through the service they provide (cf. FP 1, 3, 5) (Vargo and Lusch, 2004; 2008b).

Second, firms cannot create value during the manufacturing process, but only offer value propositions, which are evaluated exclusively by the customer (Vargo and Lusch, 2008a). The value and also the willingness to pay is determined by the perceived utility of the customer and generated during use (Vargo and Lusch, 2008a). As a consequence, exchange processes and following competence and service development processes are viewed in a unique way by each actor (Chandler and Vargo, 2011). For this reason, the real value of a firm's value proposition is bound to the context within which it is co-created by the customer (cf. FP 2, 7,

and 10). Therefore, the real value is inevitably value-in-context (Vargo, 2009; Vargo et al., 2010). Hence, firms are forced to offer value propositions according to the context of interaction. This leads to a general shift of the managerial focus from internal efficiency to external effectiveness (Vargo and Lusch, 2008a).

Third, firms and customers are always resource integrators. This implies that value is co-created by the exchange of valuable resources. Especially operant resources, which are based on skills and capabilities and act upon other resources are necessary to create adequate value propositions and thus can be a fundamental source of competitive advantage. In contrast, operand resources, meaning mainly tangible resources on which an operation or act is performed to produce an effect, decrease in their relative importance (cf. FP 4, 9) (Constantin and Lusch, 1994; Vargo and Lusch, 2004). As operant resources are exchanged, service-dominant logic sets new requirements about the intensity, scope, and nature of customer interaction. In line with Karpen et al. (2012), we argue that firms need to establish new capabilities and structures in order to interact with their customers.

Against this background, the fourth main element is related to the network perspective of service-dominant logic, as individual value for customers and firms can only be co-created in close collaboration between firms and customers (Grönroos, 2011b; Maglio et al., 2009). Customers in this regard represent resource providers and a new source of competences for firms (Prahalad and Ramaswamy, 2000). As customers define the value of service, they experience the firms' offerings in their individual context, learn how to maximize utility, and compare it to alternatives in their realm, they are no longer seen as decoupled from the firm but as mutual partners (Vargo et al., 2008). Firms and customers reciprocally co-create value, with each party bringing their own unique resource accessibility and integrability into that process (Vargo and Lusch, 2008a). As according to this view, value can only be created in processes that integrate resources, improvements of value creation processes need to extend the focus from transactions to integrated service systems. Service systems are defined as *"… arrangements of resources (including people, technology, information etc.) connected to other systems by value propositions"* (Vargo et al., 2008: 149).This system is *"(1) capable of improving the state of another system through sharing or applying its resources […], and (2) capable of improving its own state by acquiring external resources…"* (Maglio et al., 2009: 403). To highlight the aspect of value co-creation, Lusch et al. (2010: 20) emphasize the necessity to establish specific value networks, which are understood as a *"… spontaneously*

sensing and responding spatial and temporal structure of largely loosely coupled value proposing social and economic actors interacting through institutions and technology, to: (1) co-produce service offerings, (2) exchange service offerings, and (3) co-create value…". The integration of a customer's service system guarantees not only a continuous flow of information, but also helps a firm in developing service competences and reflecting the firms fit in the system (cf. FP 6, 8).

All in all, the main purpose of value as defined by service-dominant logic is not an increase of wealth for the firm, but increasing adaptability, survivability, and system wellbeing of the whole beneficiary system (Vargo et al., 2008). This influences the design of organizational systems and shows that the firm's perspective on capturing value changes from short-term financial returns to the long-term value creation potential over the lifetime of the interaction relationship (Payne et al., 2008).

4.2.2.2 Business Models

In order to understand how parameters of the business model should be aligned to the rationales of service-dominant logic, a congruent understanding of the business model concept is needed. Since the 1990s, the concept of business models has gained increasing attention from scientific research (Schneider and Spieth, 2013). *"Understanding how business works and how value is created for different stakeholders has become the grail quest of management scholars in recent years"* (DaSilva and Trkman, 2014: 381). Business models define the internal and external organizational system in which value is created (Teece, 2010). Because of differences in these systems, the same idea arising from two different organizations will likely yield two different economic outcomes (Chesbrough, 2010). Scholars acknowledge the significant role business models play for firm performance and in generating competitive advantage (Zott et al., 2011).

Business model concepts have been rather independently developed by different management disciplines such as e-business, strategy, innovation, and technology management or different streams of organizational research (George and Bock, 2011; Zott et al., 2011). Therefore, linkages between the proposed business model concepts remain up to now sparse and to date no general accepted definition of the term is available.

Morris et al. (2005) categorize business model definitions into economic, operational, and strategic definitions. Economic definitions focus on profit generation, operational definitions are related to the architecture of internal processes and activities, which aim at generating value, and strategic definitions refer to market positioning, interactions across organizational boundaries or growth. However, as business models integrate organizational and strategic aspects, definitions combining these categories are of interest:

> *"A business model articulates the logic and provides data and other evidence that demonstrates how a business creates and delivers value to customers. It also outlines the architecture of revenues, costs, and profits associated with the business enterprise delivering that value."* (Teece, 2010: 173)

> *"We define a business model as a representation of a company's underlying core logic and strategic choices for creating and capturing value within a value network"* (Shafer et al., 2005: 202)

> *A business model is "…an architecture for the product, service and information flows, including a description of the various business actors and their roles; and a description of the potential benefits for the various business actors; and a description of the sources of revenues."* (Timmers, 1998: 4)

Although the definitions differ slightly, the adopted perspective on business models focuses on the strategic logic and on firm-centric activities related to a firm's value proposition model, value creation model, and value capture model as well as on the boundary spanning and networked nature of business models. Therefore, the business model as a unit of analysis offers a systemic perspective on how to do business (Zott et al., 2011). According to Zott and Amit (2013), business models consist of subsystems that have been designed to maximize the value for all stakeholders. In this context, a business model consists of an activity system among internal and external actors in order to co-create and capture value (Zott and Amit, 2010).

Related to service-dominant logic, the business model can be seen as the structural and social template in which value co-creation (can) take place. Besides organizational design factors, a business model comprises interconnected resources and capabilities (Nenonen and Storbacka, 2010) that enable the firm and the firm's network partners to jointly create value for all

involved actors. In line with this, we employ the definition by Zott and Amit (2008: 5) who define a business model as *"… a structural template of how a focal firm transacts with customers, partners, and vendors"*. Their view of the business model is based on the assumption that the focus of organization design shifted from the administrative structures to the structural organization of exchanges with external stakeholders and that the locus of value creation increasingly extends traditional firm boundaries. The aim of designing a business model should be to define, link, and monitor activities of co-creating actors to compete successfully in a market (Chesbrough and Schwartz, 2007). Therefore, an analysis of the business model from a service-dominant logic perspective should primarily focus on an interaction-based conceptualization compared to the more common value based conceptualizations of the business model (e.g. Johnson, 2010). Thus, we follow Amit and Zott (2001) who highlight three business model dimensions: transaction content, transaction structure, and transaction governance (see table 4.2–2). These dimensions are all directed to maximize the joint value creation potential of internal and external networks. Moreover, customer integration can be conceptualized at all three business model layers, because the authors adopt – amongst other things – ideas from strategic network theory for this conceptualization. Hence, the concept links a firm's network configuration to its value creation processes, indicating that value is (co-)created by the network rather than by the firm alone (Amit and Zott, 2001).

Transaction Content	Transaction Structure	Transaction Governance
▪ Information and goods that are being exchanged ▪ Resources and capabilities required to enable exchange	▪ Network size ▪ Ways in which parties are linked and exchanges are executed ▪ Order and timing of exchanges ▪ Flexibility and adaptability of transaction structure	▪ Nature of control mechanism (e.g. trust, incentives) ▪ Locus of control of flows of information, goods, and finances

Table 4.2-2: Sources of value addressed by business model construct.
Source: Own illustration based on Amit and Zott (2001: 514).

The three layers of the business model are seen as design elements of the activity system. The transaction content defines which activities have to be performed in order to create customer value. Therefore, the content of the transactions within the activity system sets the scope of a firm's business activities as well as the requirements for capability development and resource deployment (Zott and Amit, 2010). The specific content in this regard is defined by intangible

and tangible assets (information and goods) that are being exchanged (Amit and Zott, 2001). The transaction structure describes how activities are linked. It therefore defines the sequence and the relative importance of the activities in a business model (Zott and Amit, 2010). In addition to the administrative structure, it also refers to the parties that participate in the exchange and the means by which they are connected (e.g. mechanisms adopted to facilitate exchanges). Complexity and density of the transaction structure influence flexibility, adaptability, and scalability of the actual transactions (Amit and Zott, 2001). Finally, transaction governance defines the roles and responsibilities of the actors in the activity system as well as the mechanisms by which their activities are coordinated and the content of exchange is controlled (Zott and Amit, 2010). Governance mechanisms are tools that are used to establish and structure exchange relationships (Heide, 1994). Governance can be divided into formal and informal governance. “Formal” corresponds to a more contractual-oriented understanding of governance, while “informal” is associated with a relational, trust-based view and cooperative atmosphere (Dyer and Singh, 1998; Faems, Janssens, Madhok, and van Looy, 2008; Liu, Luo, and Liu, 2009). Formal governance implies that specific rules are set and recorded for a transaction. In addition, the monitoring of compliance with rules and the handling of rule violations are explicitly set (Williamson, 1999). This measure, although necessarily incomplete regarding potentially occurring situations, offers a defined reference level for ex-post revisions. In case of informal governance, rules are often just abstractly formulated and not written down. The monitoring of compliance with rules is unscheduled and the sanctioning of violations does not follow explicitly recorded procedures (Liu et al., 2009). Formal governance requires at the beginning of a transaction a clear specification of mutual behavioral expectations and entails higher predictability (Williamson, 1999). Informal governance leaves more room for ambiguity. It is based on abstract goals, values, norms, and thought patterns and restricts the scope of action less than formal governance (Ghoshal and Moran, 1996).

4.2.3 Service-dominant Logic and Business Model Design

Literature provides evidence that the design of new business models is influenced by an increasing importance of service (Kastalli et al., 2013; Nenonen and Storbacka, 2010; Storbacka et al., 2012). Therefore, it is not surprising that in recent years prominent service-related business models have been developed. Johnson (2010), for example, proposes a set of twenty different business model types – seven of them encompass a clear service focus (e.g.

"Do more to address the job": integrating additional solutions beyond the traditional product and service portfolio to increase customer satisfaction or "Servitization of products": substituting one-time product transactions by long-term service agreements). Many of these business model types include service propositions that are directed to the long-term maximization of value-in-context. In these models, individual goods and services are mainly understood as a kind of platform that allows for establishing value co-creation (Vargo and Lusch, 2008b). The diffusion of these newly developed, highly service-related business models can especially be analyzed in business-to-business settings where many firms are about to or already shift to new business models like full service contracting (Freiling, Wassermann, and Laudien, 2012; Schneider et al., 2013). Ng et al. (2012) highlight the transition of Rolls Royce' airline business. While traditionally the firm's value proposition has been goods-dominant (i.e. selling engines to aircraft manufacturers), nowadays service provisions are directed to the maximization of customer utility (i.e. service contracts with airlines are concluded to ensure the reliability and thus long-term efficiency of airplanes). Other examples in the business-to-business context would be IBM or GE. Nevertheless, firms focusing at business-to-customer relations – for example Apple – employ service business models as well (Vargo and Lusch, 2008a).

To be able to analyze possible influences of service-dominant logic thinking on the design of business models, the existing "dominant logic" that describes the basic plan of firms how to do business (Bettis and Prahalad, 1995) has to be changed. Value co-creation cannot be assumed to take place automatically (Grönroos, 2011b). Firms have to take strategic actions and adjust their basic idea of doing business to be able to match the growing demand for service and to facilitate value co-creation. This seems to be a crucial precondition for establishing service-related business models. Furthermore, a service-dominant orientation requires the development of several firm level capabilities (Karpen et al., 2012). As this affects the whole firm (Grönroos, 2006), it is most likely that a firm cannot offer a service-dominant value proposition as long as its internal processes are not adjusted and remain standardized. Employing service-dominant logic requires changes of the underlying logic how a business works. Hence, also fundamental changes of the firm's extant activity system are necessary (Chesbrough, 2010; Ng and Briscoe, 2012; Ng et al., 2012).

Mapping the underlying processes and elements of a specific business model, identifying their interrelationships and lastly changing each one of them, is one possible way of

facilitating business model re-design (Scott-Kemmis, 2012). Although previous studies have addressed service innovation or even the transition from product- to service-based business models (Kindström, 2010), an integration of service-dominant logic thinking and the business model concept is yet to be established. To provide guidelines for the transition of a firm from solely offering goods to providing integrated service solutions, we mirror each of the model design elements against the requirements of the service-dominant logic.

4.2.3.1 Influence of Service-dominant Logic on the Transaction Content

First, the transaction content has to be considered, which relates to the information and goods being exchanged as well as to resources and capabilities enabling this exchange. Adopting service-dominant logic, the central unit of exchange is service, which comprises of all necessary elements that are required by the service beneficiaries (Vargo and Lusch, 2004). Especially the value-in-context perspective has to be taken into account. The individual assessment of the value of a firm's value proposition subsumes objective elements (goods, resources etc.) and subjective aspects (functionality, symbolic value etc.) (Payne et al., 2008). As these collective value perceptions vary among individuals according to specific contextual requirements or preferences, the value of firm offerings is not equal for potential customers. Furthermore, this means that the value being created or transferred in exchange does not hold the same value as the physical objects exchanged (Vargo et al., 2008). This perspective is important as it causes a necessity to replace an objective perspective on value by a subjective value perspective that is determined by the structure of needs of the partners taking part in the value creation process. In offering a service, a firm must consider the customer's perspective, its own perspective as well as the one of multiple stakeholders in the associated service system. Each of these raises different concerns about what can be or should be offered, and each requires a different reasoning strategy (Maglio and Spohrer, 2013) that is based on a sense and response logic (Lusch and Webster, 2011). Moving the locus of value creation from exchange to context, requires a different understanding of value from one based on units of firm output to one based on processes that integrate resources. Value co-creation in service systems takes place through a process of proposition, acceptance, and evaluation of value. Service providers propose value in the market based on their competences and capabilities. This value proposition is accepted, rejected, or unnoticed by other service systems in need of resources (Maglio et al., 2009). Even in case of acceptance, the individual willingness to pay for the offering varies with the individual value-in-context.

For the design of business models, value-in-context means that value propositions need to address the contextual requirements of customers. As these may vary among different interactions (with different customers or even with the same customer), value propositions need to be more flexible and wide-ranging. As this limits the possibility to standardize products and processes firms are required to find ways to align customizable offerings with efficient internal value creation. For instance, insights from mass customization can be adapted to offer highly individualized service in a timely and cost efficient manner.

Proposition 1a: The design of service-dominated business models requires that the content of interaction is ultimately service-dominated, meaning that goods, services, information etc. have to be aligned with the requirements of service beneficiaries.

The reciprocal provision of service supersedes the production and distribution of (either tangible or intangible) "units of outputs" (Vargo and Lusch, 2008a). Against this background, a focus on interaction instead of exchange is needed (Grönroos, 2006). It is no longer possible to distinguish between the provider and the recipient of value as value creation is based on collaboration. As collaboration between value-creation partners has to be established, severe changes are required regarding the time-related perspective on value creation experiences. The rather short-term goods-dominant value perspective is replaced by a more long-term service-dominant logic perspective on value creation. In other words: it is most likely that due to the need for collaboration in service-dominant business models one-time transaction revenues are typically replaced with long-term recurring revenue models (e.g. leasing or pay-per-use) (Johnson, 2010).

Proposition 1b: Implementing service-dominant logic causes a need to re-define the basic understanding of transactions. The transaction partners no longer exchange goods/services against money but relevant resources in order to co-create value-in-context.

Even if firms aim at creating value jointly with network partners, this task is not easy to achieve as it is first of all necessary to acquire and develop specific resources and capabilities that are necessary to enable value co-creation (Karpen et al., 2012). On the one hand, business models should facilitate the application and exchange of operant resources (Vargo and Lusch, 2004) as especially these resources are of relevance in integrating network partners into value

creation processes. While operand resources are primarily tangible, static resources that require some action to make them valuable, operant resources are primarily intangible, dynamic resources that are capable of creating value (Vargo and Lusch, 2008a). Making use of operant resources is helpful as it goes along with an enhanced focus on service provision that replaces the old focus on product sales. In this view, firms need to develop relevant capabilities that enable partners to engage in co-creation activities (Nenonen and Storbacka, 2010; Storbacka et al., 2012). While traditionally relevant competences were related to technological resources and internal process efficiency, the transition to service oriented business models requires the establishment of capabilities that are generating value for the partner and help to integrate the resources of the partner into value creation. Examples of such capabilities are customer and market insight processes, sales and account management, customer experience management, customer relationship management, and customer service management (Nenonen and Storbacka, 2010). Furthermore, firms need to establish relevant capabilities in order to recognize changing market needs and adapt the organization to new requirements regularly (Doz and Kosonen, 2010).

To be able to benefit from value co-creation, firms are required to establish adequate channels for an exchange of operant resources (Lusch et al., 2010). Once established, these channels are also helpful to provide assistance to the network partners during their usage of the provided service offerings (Vargo and Lusch, 2008b). Service-oriented business models should take into account that enabling interaction with network partners is crucial as this opens a new source for operant resources (Grönroos, 2006; Prahalad and Ramaswamy, 2000). In the business model context, this means that connection points need to be established that enable a co-creation with customers. Payne et al. (2008) for instance proposes that so-called service encounters need to be initiated along the customer journey. These encounters should integrate the processes and goals of customers and service providers and ensure an ongoing exchange of operant resources. They can range from information materials to collaborative workshops.

Proposition 1c: In order to facilitate exchange with network partners, firms need to develop and apply primarily operant resources.

Madhavaram and Hunt (2008) argue that firms are further required to establish so-called meta-operant resources like market sensing or absorptive capacity that are not only linked to the firm level but help to transfer a sense of service-dominant thinking and behavior to the

employee level. Interaction with network partners should take place on different levels. Therefore, it is of utmost importance to develop basic collaborative competences and a variety of interaction competences (Karpen et al., 2012; Lusch et al., 2007) as otherwise the results of implementing service offerings may for both sides not come up to the expectations. Karpen et al. (2012) reflect the requirements for an integration of service-dominant logic into the orientation and culture of the firm. They propose that six interaction capabilities are needed in order to ensure mutual understanding and resource integration among service providers and customers. (1) Individuated interaction capability: To learn how customer processes work, understand their contextual factors, and respond to expectations of individual customers; (2) Relational interaction capability: To be able to establish social and emotional bonds by stimulating dialogue and improve social interaction with customers; (3) Ethical interaction capability: To be able and willing to act fair and non-opportunistic toward customers especially through information transparency; (4) Empowered interaction capability: To enable customers to actively engage in joint value creation by providing adequate channels and interfaces and giving priority to their opinions; (5) Developmental interaction capability: To be able to assist customers to develop new relevant competences by training, advices or information provision; (6) Concerted interaction capability: To be able to facilitate coordinated service processes by synchronizing mutual activities and aligning goals.

Proposition 1d: To enable a successful exchange of value, transaction partners have to develop specific collaborative competences.

4.2.3.2 Influence of Service-dominant Logic on the Transaction Structure

Inevitably, changes of the transaction content entail a modification of the transaction structure. The traditional firm-focused value chain is replaced by a value-creation network (Lusch et al., 2008). This is of relevance, as value co-creation does not only affect two parties, but is open for a contribution of many partners (Gummesson, 2007). Actors become increasingly dependent on each other's processes and activities, which requires process harmonization across and within organizational boundaries (Oliva and Kallenberg, 2003).

Nenonen and Storbacka (2010) state that the effectiveness of a business model for value co-creation is determined by the internal configurational fit between all business model elements and the external configurational fit between provider's and customers' business models. Based on the value network concept a higher complexity of value creation processes has to be

taken into account by firms. Linking multiple network partners in one coherent framework is not an easy task – especially when these partners are also embedded in idiosyncratic service systems. According to Vargo et al. (2008) value co-creation is not limited to specific activities of any one exchange or a dyad. It occurs through the integration of existing resources with those available from a variety of service systems, which include internal (e.g., own, employees), private (e.g. friends, stockholders), and market-facing (suppliers, other economic exchanges) systems and resources.

To successfully build and maintain a value creation network, firms have to be aware not only of their direct network partners as including them into the joint network goes along with secondary effects that are caused by linking the firm networks. In this regard, firms need to be aware of their relative network position and the availability of ties towards actors in the service system (Nenonen and Storbacka, 2010). One main aspect in this context is that an enhanced overall network size may provide a broader base for firms to externally acquire resources. Since complexity issues may limit the integration of the entire business model into the service network, Storbacka et al. (2013) propose to set up separate smaller units in which networks with customers and suppliers are developed in order to co-create specific solutions. In case of success, they, together with their service network, can be reintegrated into the main organization (Markides, 2013).

Proposition 2a: By implementing service-dominant logic, firms are confronted with the challenge to handle multi-dimensional value creation activities that take place in a combined network of different service systems.

The goods-dominant logic-related old value chain concept implies a hierarchical perspective on suppliers and customers that is characterized by superior suppliers and customers that adopt the role of only being a target in a market (Vargo and Lusch, 2008b). This traditional perspective needs to be changed as customers are during the value co-creation process not only integrated in a value creation network (as for example in the case of co-production or mass-customization), but contribute to the development of this system by bringing in their idiosyncratic service system. This multidirectional linkage leads to a – at least temporary – cooperation between the involved value systems (Grönroos, 2011b). As a consequence, the exchange between the partners that takes place is in this case not hierarchical any more but much more characterized by a heterarchic relationship between supplier and customer that interact at eye level. Concerning the structure of the interaction, firms need to support value

co-creation with their customers (Nenonen and Storbacka, 2010). In order to do so, customer and provider entities must be able to grant each other access to their relevant resources (Maglio and Spohrer, 2013). If interactions are not established yet, suppliers need to actively create them (Grönroos and Ravald, 2011) – for example by providing customers with specific tools or establishing common standards and protocols, which enhance the exchange of information and facilitating value co-creation (Lusch et al., 2010). In order to facilitate value co-creation, structures need be established that constitute an open business model (Chesbrough and Schwartz, 2007).

Proposition 2b: To implement service-dominant logic successfully, suppliers are required to provide structures that enable an integration of customers in value co-creation.

Related to this new perspective of multidirectional interactions between service systems, customers obtain the status of operant resources as they actively contribute to the value creation process. To replace the traditional "monologue" between suppliers and customers that aims at selling goods (e.g. one-sided promotion), both parties have to upgrade their relationship and enter a stage of dialogue as this is a precondition for value co-creation (Lusch et al., 2008). In this context, a firm has to specify the type of dialogue that seems to be most promising to foster the collaboration between suppliers and customers. Most importantly, this dialogue should not be based on an indirect transfer of information (action-reaction), or in other words feedback learning through the market, but rather represent a conversation or discussion that is characterized by a direct communication of suppliers and customers. Besides the organizational and administrative structure mentioned above, open business models require specific processes and activities that actively foster interaction (Chesbrough and Schwartz, 2007). Payne et al. (2008) differentiate three exchange practices (encounters): (1) communication encounters which are primarily carried out in order to connect with customers, and promote and enact dialogue (e.g. through advertisements, brochures, internet websites and manuals) (2) usage encounters referring to service that supports customer usage (e.g. using an internet banking service) and (3) service encounters which comprise customer interactions with customer service personnel or service applications (e.g. via a contact centre). Furthermore, firms are required to structurally integrate customers by providing multiple contact points (e.g. provide feedback channels, invite and motivate customers improve service) (Nenonen and Storbacka, 2010; Plé et al., 2010).

Proposition 2c: To implement service-dominant logic successfully, firms need to establish processes to foster customer interaction and dialogue.

Service-dominant logic aims at meeting customer needs in a complex and dynamic environment. Therefore, it is impossible for firms to remain static. On the contrary, they need to adapt to changing requirements and continuously develop well-fitted value propositions (Doz and Kosonen, 2010; Teece, 2010), i.e. service offerings (Lusch et al., 2007) that match market needs. In this context, firms need to take advantage of the newly established value networks and the exaggerated conversation with their customers. Value networks are open systems that are constantly learning. They are in a flux and evolve against the background of a need to adapt to changing environmental conditions (Lusch et al., 2010). To exploit the potential benefits of service-dominant logic thinking, firms have to establish strategic agility, which enable them to recognize, assimilate, and apply and external information (Doz and Kosonen, 2010). Therefore, absorptive capacity (Cohen and Levinthal, 1990) and adaptive competences play a major role (Lusch et al., 2007) as they promote the emergence of a new business model configuration. Besides the recognition and internal communication of opportunities and threats, firms need to be able to decide upon the internal requirements and reallocate resources whenever needed (Doz and Kosonen, 2010).

Proposition 2d: Suppliers need to implement structures that enable a continuous exchange of information with the business environment as precondition for a flexible reaction to customer needs.

4.2.3.3 Influence of Service-dominant Logic on the Transaction Governance

Transaction governance mechanisms refer to the flow of resources and the related modes of control (Amit and Zott, 2001). Within the traditional goods-dominant logic, customers and suppliers pursue their own individual goals (e.g. profit maximization) and therefore can be regarded as competitors. In contrast, considering service-dominant logic's definition of service (using one's resources for the benefit of another (Vargo and Lusch, 2004)), the main objective is the joint creation of value and thus "increasing the pie" for all actors instead of "claiming the largest possible piece". Vargo and Lusch (2008b) even claim that the purpose of service systems is primarily the increase of the well-being of the system itself as every member eventually benefits from an improved system. The joint value creation can be seen as the generation of relational rents (Dyer and Singh, 1998). Generating relational rents has to be

safeguarded by the establishment of adequate governance mechanisms in order to control and coordinate joint activities and behaviors.

As operant resources in exchange partnerships have to be adapted to the context of the customer, they are highly relation-specific. Their relative value is idiosyncratically bound to the relationship and in case of termination of the partnership their value decreases significantly (Dyer and Singh, 1998; Williamson, 1999). For example, if a maintenance service or distribution system is specifically developed for an individual customer, its relative value cannot be fully transferred to other processes with different requirements. Some skills and knowledge resources, which were developed in the course of the co-creation relationship (especially specific implicit knowledge about the customer), will be irrelevant or even hindering in another context. Hence, mechanisms are necessary in order to ensure the amortization of these relation-specific resources through long-term interaction (Dyer and Singh, 1998). Furthermore, members of the value network need to be motivated to participate and actively share operant resources as knowledge or complementary assets. Therefore, in service-dominant business models self-enforcing informal governance mechanisms (e.g. trust or reciprocity) should be developed among the actors (Edvardsson, Holmlund, and Strandvik, 2008; Lusch et al., 2008). Since operant resources are very often quite unique and therefore require an individual adaptation to the context of the actors (Vargo and Lusch, 2008b), formal governance mechanisms may not be able to safeguard the transfer of operant resources adequately. They require predefinition and codification and are limited in their performance. Furthermore, formal mechanisms might indicate distrust (Ghoshal and Moran, 1996) and therefore hinder the flow of operant resources.

As informal governance mechanisms develop over time in the course of repeated interactions, they go along with a better understanding of the partner, which enables a better synchronization of joint processes (Dyer and Singh, 1998) and thus increases the efficiency of the co-creation relationship. Value co-creation depends on the coordination of activities across individuals, organizations, and firms as well as often intimate relationships that involve sharing resources, risks, and rewards. Coordination of action across a network depends on information flows. As it is almost impossible to support these activities with tools or technologies, informal mechanisms are fundamental for valuing and communication between service system entities (Maglio and Spohrer, 2013).

Proposition 3a: To enable effective value co-creation within the value network it is necessary to develop relational governance mechanisms.

Value networks are not owned by a specific firm, but consist of a variety of different service systems. However, the architecture of value networks can be designed actively and thus firms can aim at becoming a "value network architect" (Lusch et al., 2010) or a value network's "prime integrator", who is – as proposed by Lusch et al. (2007) – in a stronger competitive position. This means that even if a value network consists of formal and social bonds between actors, it should be actively managed by the focal firm. This argument is in line with findings in the innovation network literature that show that a specific network management function enhance the functionality of joint processes through coordination and control (Landsperger, Spieth, and Heidenreich, 2012). In this context, the concept of a "customer as a strategic choice" (Lusch and Webster, 2011) has to be emphasized. The ability to provide adequate value propositions depends to a certain degree upon the choosing of "good" customers, who value the firm's service propositions and are willing to provide reciprocal service as well.

Proposition 3b: To control the flow of information within the value creation network a firm needs to assign specific roles to network partners to strengthen its network position.

Table 4.2–3 sums up service-dominant logic-triggered needs business model adjustment.

Business Model Construct	Key Issues
Transaction Content	
Information and goods that are being exchanged	▪ Providing service instead of producing goods/services ▪ Sense and response instead of make and sell ▪ Value-in-context instead of value-in-exchange
Resources and capabilities required to enable exchange	▪ Operant instead of operant resources ▪ Development of collaborative and interaction competences
Transaction Structure	
Network size	▪ Value network instead of value chain ▪ Collaboration of numerous service systems within the value network (network of networks) ▪ Stakeholder perspective (internal and external)

Ways in which parties are linked and exchanges are executed	▪ Interactions instead of exchange ▪ Multidirectional linkages of numerous network partners instead of supplier-customer relationship ▪ Heterarchic relationships instead of hierarchy ▪ Enabling customers to interact
Flexibility and adaptability of transaction structure	▪ Continuous exchange of information ▪ Constant adaption to changing customer needs ▪ Value networks as open systems ▪ Development of absorptive capacity and adaptive competences
Processes and timing of exchanges	▪ Value co-creation instead of added value ▪ Conversation instead of monologue ▪ Direct communication instead of action-reaction (increase of speed of information) ▪ Establishing adequate information exchange structures
Transaction Governance	
Locus of control of flows of information, goods, and finances	▪ Positioning the firm within the value network ▪ Proactive selection of network partners ▪ Assigning roles to network partners ▪ Matching own resources and competences with those of other service systems in the value network
Nature of control mechanism (e.g. trust, incentives)	▪ Mutual wellbeing instead of profit maximization ▪ Cooperation instead of competition ▪ Building of relation specific assets ▪ Knowledge transfer ▪ Complementary resources ▪ Establishing informal governance mechanisms as trust or reciprocity

Table 4.2-3: Specific adjustment needs of business models in case of implementing service-dominant logic.
Source: Own illustration.

4.2.4 Discussion, Limitations and Outlook

Our paper analyzes effects of the transition from a goods-dominant to a service-dominant business logic on the business model design. Based on Amit and Zott's (2001) business model concept we provide conceptual insights into effects triggered by this transition that cause a need for re-designing transaction content, transaction structure, and transaction governance. By contrasting insights from business model and service-dominant logic research in these dimensions, we develop ten research propositions. We show that firms that wish to integrate service-dominant strategies need to adjust the content of their transactions. As the focus shifts from transactions of physical goods to value co-creation, core-competences need to be reconsidered and new capabilities need to be developed. In order to do so, firms are required

to reflect upon their transaction structure. As value is being co-created in service systems among suppliers, customers, and other actors, firms need to reconsider their traditional boundaries. Processes and organizational administrative structures need to extend the organizational boundary in order to enable intense interaction with customers. Last, information and resource exchanges in complex value co-creation systems need specific approaches for coordination and control. Primarily informal, trust based governance mechanisms should be established to reduce opportunism and maximize joint benefits. However, these should be complemented by dedicated management functions in order to ensure efficient, coordinated resource flows.

By now, we are confident that being able to link the elements of a business model to a service-dominant business logic in a differentiated, efficient and effective way can be seen as a source of competitive advantage for a firm. As a business model provides a valuable structural template for mapping the current business logic of the firm, reflecting the elements of a business model might be a first step to identify the prevailing business logic, to overcome inertia and later on to change the way of doing business. In developing and discussing strategic options, the business model acts as a symbolic artifact that stimulates a creative decision-making process (Hacklin and Wallnöfer, 2012).

Since service-dominant logic is mainly criticized because of its limited managerial implications (Achrol and Kotler, 2006; Ballantyne and Varey, 2006), an integration of service-dominant logic thinking and the business model concept is highly eligible. The business model concept provides a framework that helps firms to deal with very often customer-driven service requirements. By referring to this concept and including it in our thoughts, we are able to transfer the discrete service-dominant logic concept to a managerial level. In this regard, managers can rely on the theoretical implications when rethinking their business model or developing entirely new business models. Our conceptual thoughts could be considered in business model generation workshops. Our rather general propositions could be adapted to concrete business requirements when applying for instance the prominent business model canvas (Osterwalder and Pigneur, 2010) or analogy based approaches (Johnson, 2010; Kaplan, 2012).

We are aware that we are only able to analyze the need for change on a very general level. We are due to newness and complexity of our research topic not able to go more into detail and to analyze change processes that take place within the business model layers. The developed

propositions represent a first step to identify specific business model parameters that need to be adjusted in order to proactively shape service-dominant business models. They are a starting point for future empirical research that may contribute to developing a more detailed understanding of the way that service-oriented business models work.

Our study provides a first approach for future researchers to develop concepts that guide managers during the process of implementing a service-oriented business model. However, we are aware that due to the conceptual nature of the paper our research is affected by certain limitations.

First, service-dominant logic has not reached the state of a theory yet (Vargo and Lusch, 2008b) and likewise the concept of business models is not entirely theoretically founded (Zott et al., 2011). We also need to emphasize that changing a business model is not always a structured process, but very often related to experiments (Chesbrough, 2010) and organizational learning (Sosna et al., 2010). The transformation of a business model is highly influenced by the organizational culture (Bock et al., 2012) and in most cases requires changes on the organizational culture vice versa. This is especially relevant if the entire organization needs to shift from a goods-dominant to a service-dominant paradigm. Managers have to consider certain barriers to accomplish a successful transition to a new business model. For example, an early failure could stop the learning process causing a lock-in in the existing model (Sosna et al., 2010). Furthermore, Chesbrough (2010) identified cognitive barriers because established business models strongly influence managers' information search and information filtering processes.

As we considered all dimensions of the business model from a service-dominant logic perspective, intermediate stages or parallel business models were not considered in our study. As the transition between a goods-dominant logic and a service-dominant logic might not be possible for an entire business at once, further studies could investigate opportunities for firms to transform the business model in an evolutionary process (Demil and Lecocq, 2010; Sosna et al., 2010) or to operate more than one business model simultaneously (Markides, 2013; Storbacka et al., 2013).

We believe that future research should continue where we left off. We perceive a need for empirical work. However, we suggest focusing on qualitative research before conducting quantitative studies in order to further analyze the interdependency of business models and a

changing dominant logic and to define elements of service-dominant logic and business model more precisely. Informed by well documented examples of successful business models (Johnson, 2010), learning from business practice might be necessary before concluding a general concept of service-dominant business models. As proposed elsewhere (Nenonen and Storbacka, 2010) considering insights from social network analysis (Granovetter, 1985) could clarify the importance of ties and positions of service integrators in value networks.

In spite of the mentioned limitations, we feel confident that applying the business model concept in a service-dominant logic context can foster academic research and provide useful insights for managerial practice.

4.3 Understanding Determinants of Business Model Design in the Context of Product-Service Transition[3]

Abstract

Changing ecosystem conditions increasingly cause manufacturing firms to strive for service-related opportunities. Prior research emphasizes the importance of this so-called product-service transition, but only analyzes isolated aspects of this phenomenon. We argue that product-service transition is multidimensional in nature. Therefore, we employ a business model lens that allows for encompassing a holistic perspective and for examining multiple interrelated issues of product-service transition. Against the background of a multiple-case study comprising 17 cases, we identify four specific business models that each draw on a distinct source of value creation. We show that the choice of a particular business model results from the employed service strategy. Furthermore, we uncover antecedents that determine the success of a business model in the context of product-service transition.

Keywords: Business model design; product-service transition; service strategy; manufacturing industry; multiple-case study.

4.3.1 Introduction

Manufacturing firms are recently challenged by an ecosystem-driven need to integrate services into their portfolio of offerings (Eggert, Hogreve, Ulaga, and Muenkhoff, 2014; Kowalkowski et al., 2015; Ostrom et al., 2010). Especially advancements in information and communication technology and following an integration of national markets led to intensified competition and to an increased transparency and comparability of product offerings (Kastalli et al., 2013; Teece, 2010). This development unfolded a new type of customer behavior that is characterized by a faster adaption to product innovation (DaSilva and Trkman, 2014; Prahalad and Ramaswamy, 2002) as well as a high demand for customized solutions (Jaakkola and Hakanen, 2013; Ulaga and Reinartz, 2011). As a consequence, manufacturing firms need to rethink their traditional product-centered way of doing business in order to

[3] This paper is co-authored by Sven M. Laudien* and Birgit Daxböck* [*equal contribution]. It is currently under review in a peer reviewed journal. Please note that differences between this manuscript and the final publication may exist. In case of questions, please contact the author of this thesis (birgit.daxboeck@gmail.com).

pursue service-related opportunities (Gebauer, Edvardsson, Gustafsson, and Witell, 2010; Oliva and Kallenberg, 2003; Davies and Brady, 2000). Neely (2008: 107) refers to this product-service transition as "servitization" and addresses this phenomenon as a development that *"…involves the innovation of an organization's capabilities and processes so that it can better create mutual value through a shift from selling products to selling Product-Service Systems."*

Although the rationale and the benefits of product-service transition are already explained by literature (e.g. Cusumano et al., 2015; Oliva and Kallenberg, 2003), traditional manufacturing firms often struggle to successfully implement a service-related strategy (Fang et al., 2008; Gebauer et al., 2005). As Neely's (2008) definition already indicates, modifying a firm's portfolio of offerings from stand-alone products to service-oriented solutions is not sufficient in this context. Instead, firms need to rethink the whole value creation process (Eggert et al., 2014; Ramirez, 1999). In doing so, they have to shift their perspective of value creation from a firm-centered perspective toward a system perspective which understands value creation as an iterative process involving customers as well as other business partners (Chesbrough, 2011). Hence, a firm needs to change its basic business logic of how mutual value is created for all parties within the firm's business ecosystem (Gebauer, Edvardsson, Gustafsson, and Witell, 2010; Neely, 2008). As a consequence, an analysis of the product-service transition should not focus on the service content of offerings in isolation – as the majority of existing studies does (e.g. Fang et al., 2008; Neu and Brown, 2005; Oliva and Kallenberg, 2003) – but consider interactions with other firm activities (Gebauer et al., 2011).

Against this background, a new unit of analysis is necessary that allows for coevally considering firm-internal and firm-external aspects. We argue that the business model is an appropriate unit of analysis to investigate product-service transition as it *"… is a reflection of the firm's realized strategy"* (Casadesus-Masanell and Ricart, 2010: 195). Therefore, the business model allows analyzing the outcome of service-related strategies manufacturing firms employ. Additionally, the business model encompasses a system-level perspective (Zott and Amit, 2013) that includes firm-centric activities as well as activities spanning the boundaries of the firm (Zott et al., 2011). Thus, by focusing on the business model as unit of analysis it is possible to include interactions between the focal firm and the business ecosystem that are crucial in the context of product-service transition into our research.

Some researchers already address product-service transition by referring to the business model concept. These researchers mainly focus on value creation aspects of business models (e.g. Kastalli et al., 2013; Wise and Baumgartner, 1999), on specific "real world" examples of business models (e.g. Mason and Spring, 2011; Ng et al., 2012), or develop new business model conceptualizations in the context of product-service transition (e.g. Storbacka et al., 2013). In contrast to these studies, we make use of the business model concept to analyze how manufacturing firms implement service-related strategies in detail. We depart from the assumption that there is no best practice business model that results from a manufacturing firm's product-service transition. Manufacturing firms perceive the need for or the opportunity to pursuing a service-related strategy in different ways (Kowalkowski et al., 2015). As a consequence, these firms may employ different business model designs to respond to this challenge. However, it is by now unclear which factors influence business model configurations in the context of product-service transition (Ostrom et al., 2015). Against this background, we ask: *(1) How can business models manufacturing firms employ as a result of product-service transition be characterized and categorized? (2) Why do manufacturing firms make use of a specific business model design in the context of product-service transition?*

We contribute to a deeper understanding of product-service transition by identifying four different business models that result from service-related strategies of manufacturing firms. In doing so, we provide evidence that product-service transition is a multidimensional phenomenon and challenge the by now mainly unidimensional view on product-service transition prevalent in literature (e.g. Eggert et al., 2014; Oliva and Kallenberg, 2003). According to our case data, all four identified business models manufacturing firms employ can be a suitable response to product-service transition challenges in a mature industry. This insight highlights that different types of service offerings, different linkages to network partners, and different governance mechanisms can successfully be utilized by manufacturing firms in pursuing product-service transition. Thus, our results contrast the viewpoint presented by Cusumano et al. (2015) who state that the maturity level of an industry determines the amount and design of service offerings. Furthermore, we enhance literature by uncovering antecedents that determine the success of manufacturing firm business models in the context of product-service transition.

4.3.2 Background

Product-service transition is a phenomenon that has attracted interest during the last decades by practitioners as well as by researchers (Cusumano et al., 2015; Galbraith, 2002; Neely, 2008; Wise and Baumgartner, 1999). Ostrom et al. (2015) highlight that research on product-service transition is reflected in two different, but recently converging literature streams. The first literature stream (e.g. Baines, Lightfoot, Peppard et al., 2009; Kastalli and van Looy, 2013) is enrooted in an operational management perspective and focuses on analyzing how manufacturing firms implement service-based strategies. The second literature stream (e.g. Mathieu, 2001; Tuli et al., 2007) aims at understanding how manufacturing firms develop service-based strategies and how these strategies are translated into changes on the value proposition level. Research on product-service transition very often departs from the basic assumption that product-service transition is unidimensional in nature and shifts between an entire product focus and a complete service focus manufacturing firms employ (Oliva and Kallenberg, 2003). This assumption is currently widely accepted in literature (Kowalkowski et al., 2015). Against the background of this assumption, researchers analyze, for example, organizational factors that influence product-service transition (e.g. Gebauer et al., 2005; Neu and Brown, 2005), capabilities manufacturing firms need to possess in order to pursue product-service transition (e.g. Fischer et al., 2010; Ulaga and Reinartz, 2011), or the role of a specific service culture manufacturing firms need to develop to successfully implement service-related strategies (e.g. Gebauer, Edvardsson, and Bjurko, 2010; Gebauer and Friedli, 2005).

Only recently, researchers take into account that product-service transition could also be multifaceted (Kowalkowski et al., 2012; Kowalkowski et al., 2015) and call for a more integrative research approach to this phenomenon (Gebauer et al., 2011; Lightfoot et al., 2013). In this context, researchers assume that manufacturing firms not only need to think about the design of the firm-internal aspects, but also have to consider external factors such as changes in the behavior of customers and other network partners (Gebauer et al., 2013; Gustafsson, Kristensson, and Witell, 2012) in the context of product-service transition. In an attempt to overcome the shortcomings of a unidimensional perspective on product-service transition, researchers (e.g. Ostrom et al., 2015; Storbacka et al., 2013) call for employing a business model lens as it allows for a differentiated view on product-service transition. Some researchers already refer to the term business model in this context. However, on the one

hand business model conceptualizations developed in the context of product-service transition (e.g. Storbacka, 2011; Storbacka et al., 2013) often encompass a rather narrow focus on service-related aspects. On the other hand, researchers (e.g. Davies, Brady, and Hobday, 2007; Kindström et al., 2013; Ulaga and Loveland, 2014) often use the term business model as a buzzword, but fail to provide a traceable understanding of business models that is tied to insights provided by business model literature. Against this background, we believe in the necessity to establish a basic understanding of the business model concept before we utilize it in the context of our research.

Although the business model concept receives increasing attention, a standard definition of this concept has not been developed yet (George and Bock, 2011; Spieth et al., 2014; Zott et al., 2011). However, a consensus emerged that business models provide an understanding of the way how firms do business by describing mechanisms how to create value and deliver it to stakeholders (Casadesus-Masanell and Ricart, 2010; DaSilva and Trkman, 2014). Additionally, business models display a firm's ability to generate value and capture a part of that value (Chesbrough, 2007a; Teece, 2010).

The existing service-focused business model conceptualizations (e.g. Storbacka, 2011; Storbacka et al., 2013) cannot be applied in our research context as they only look at service-related issues and do not provide a holistic picture of how firms create, deliver, and capture value. We need a business model conceptualization that allows for considering and comparing all possible configurations of business models in the context of product-service transition. In our paper, we employ the business model conceptualization of Amit and Zott (2001; see also Zott and Amit, 2010) which depicts an overarching meta-model and provides a framework that allows for analyzing realized product-service transition strategies in a comprehensive way within and across a focal firm's boundaries. In contrast to other business model conceptualizations, the Amit and Zott (2001; see also Zott and Amit, 2010) meta-model can be utilized to compare business model designs along predefined and distinct dimensions. Moreover, this business model conceptualization is in contrast to other business model conceptualizations based on a cross-theoretical background (Morris, et al., 2005). Although the business model conceptualization of Amit and Zott (2001) was developed in an e-business context, due to its linkage to a theoretical background (Schumpeterian innovation, network theory, resource-based view, and transaction cost economics) that is highly relevant in the context of manufacturing firms, it can also be employed in our research context. This

theoretical embeddedness is important for us as we aim at understanding determinants of business model design choices in the context of product-service transition.

Amit and Zott (2001; see also Zott and Amit, 2010) distinguish three different design elements. First, *content* comprises goods and information that are being exchanged. It determines resources and capabilities that are necessary to enable the exchange. Second, *structure* refers to all internal and external parties as well as exchange mechanisms that link these different parties in order to facilitate exchange. Last, *governance* encompasses mechanisms that are used to assign the execution of specific activities to distinct parties.

The configurations of the three design elements determine four different design themes that are each linked to a specific source of value creation (Amit and Zott, 2001). In detail, the four design themes can be characterized as follows (Amit and Zott, 2012; 2001; Zott and Amit, 2010). Firms that employ a *novelty-centered* design theme aim at continuously innovating content, structure, and governance (e.g. pursuing the forward or backward integration of activities, or developing new governance designs). The main objective of a *lock-in-centered* business model design theme is to improve retention of customers and other business partners. In this context, firms configurate content, structure, and governance in a way that switching costs and network externalities increase a customers' willingness to maintain the business relationship. A *complementarities-centered* business model design theme creates value by capitalizing on complementarities among resources and activities. Firms may, for example, bundle specific activities (e.g. integration of products and services) or offer additional complementary value propositions that are not directly linked to the exchanged good. Last, to benefit from an *efficiency-centered* business model design theme firms need to configurate the business model design elements content, structure, and governance in a way that allows for reducing transaction costs for all partners. Figure 4.3–1 illustrates the business model conceptualization by Amit and Zott (2001; see also Zott and Amit, 2010).

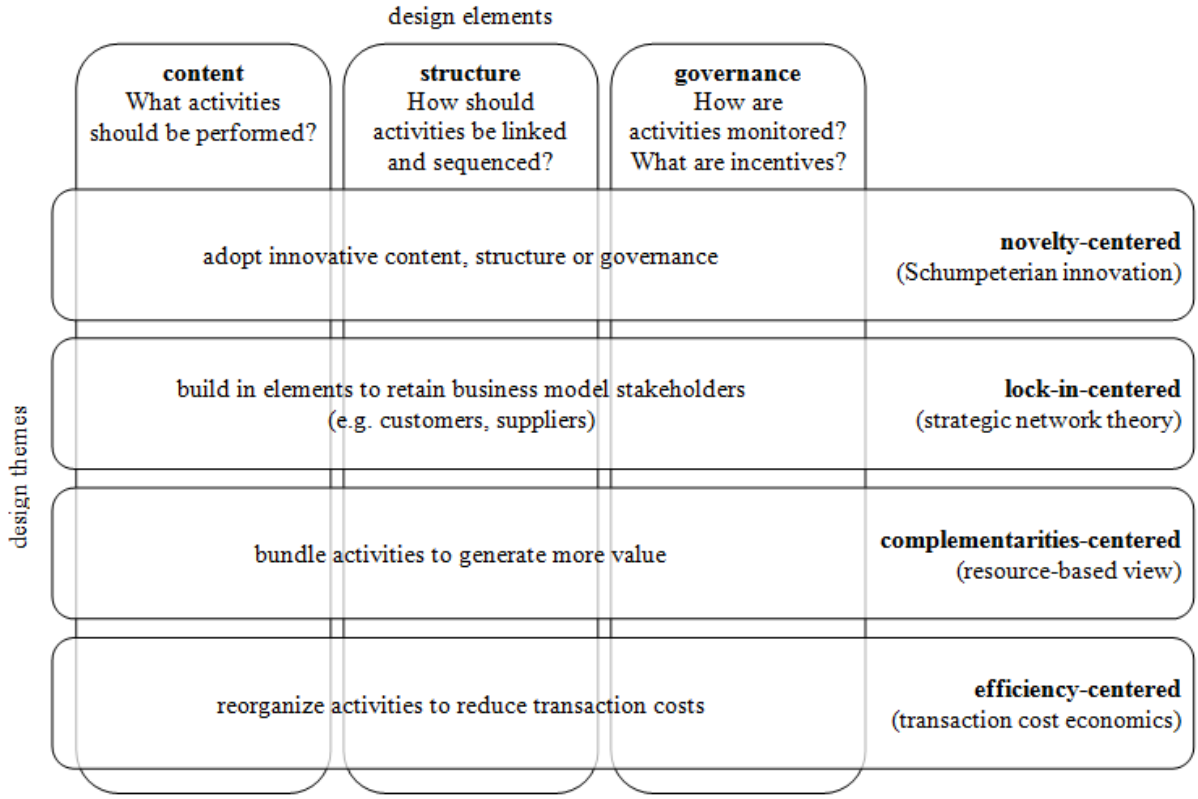

Figure 4.3-1: Business model conceptualization by Amit and Zott.
Source: Own illustration based on Amit and Zott (2001) and Zott and Amit (2010).

4.3.3 Methodology

4.3.3.1 Research Method

Analyzing how manufacturing firms strategically approach product-service transition and understanding their strategic choices that become manifest in the firms' business model designs requires a deep insight into determinants of firm decisions. Consequentially, we regard a case study approach (Eisenhardt, 1989) to be an appropriate method to research this phenomenon. Especially in the realm of rather new and still insufficiently explored research contexts, case studies are likely to provide accurate and valuable theoretical insights (Eisenhardt and Graebner, 2007; Orum, Feagin, and Sjoberg, 1991) and helpful to gather rich, in-depth data (Anteby et al., 2014; Bluhm et al., 2011; Yin, 2009). Furthermore, Welch et al. (2011) emphasize that case study research also contributes to contextualization and thus helps to illustrate and communicate theory.

Although we investigate a rather novel phenomenon, our main objective is not to set up a radically new theory, but to advance existing theory. Therefore, especially systematic

combining (Dubois and Gadde, 2002) is an appropriate procedural method to reach our research objective. In contrast to grounded theory (Glaser, 1992; Glaser and Strauss, 1967), that mainly focuses on the process of data collection and theory discovery without taking prior research into account (Eisenhardt and Graebner, 2007; Langley, 1999), systematic combining places emphasis on theory development. It is characterized by a systematic matching of empirical data and literature (Dubois and Gadde, 2002). Hence, an abductive logic is employed that integrates inductive and deductive reasoning (Durand and Vaara, 2009). Therefore, it allows for an integration of existing literature and new empirical insights. Systematic combining is also utilized by other researchers (e.g. Erkama and Vaara, 2010; Edvardsson et al., 2008; Harryson, Dudkowski, Stern, 2008) who emphasize the benefits of this method. Therefore, we are confident that our approach is appropriate related to our research aim.

4.3.3.2 Data Collection

We selected 17 case firms by using purposeful sampling (Denzin and Lincoln, 2005; Patton, 2002). Our sample consists of firms that operate in business-to-business settings in mature manufacturing industries as these industries are particularly characterized by firms that pursue product-service transition in order to increase profitability (Oliva and Kallenberg, 2003). The case firms' headquarters are located in Austria, Germany, and The Netherlands. To ensure comparability and to reduce extraneous variation (Eisenhardt, 1989), we selected firms that do not make use of more than one business model at the same time. This excludes firms from our study that utilize for instance so-called dual business models as described by Markides and Charitou (2004). As a consequence, our sample only consists of firms with a maximum of 1,000 employees. Additionally, we selected manufacturing firms with a firm age of at least ten years. This was necessary as new ventures are usually not challenged by product-service transition. According to Dubois and Gadde (2002), sampling is a continuous process that overlaps with data analysis. Hence, based on publicly available information we carefully selected cases that were assumed to provide similar results (literal replication) as well as contrasting results (theoretical replication) (Yin, 2009). In this context, Yin (2009) suggests – in contrast to Eisenhardt (1989) – that there is no ideal number of cases. Instead, he points to the necessity to go on with data collection until no new information can be obtained. We achieved saturation with a sample size of 17 cases. Table 4.3–1 provides detailed descriptions of the case firms that define of our sample. Due to the fact that our research touches sensible

firm information, the representatives of the case firms asked us not to disclose any information that may reveal the identity of their firms. We respect their concerns and therefore present anonymized data.

Case firm	Industry	Market presence	Firm description
Case 1: MAH	355 – special industry machinery, except metalworking	Worldwide	High complex core product offering; accompanied by a wide range of service offerings (e.g. consultation, engineering, long-term maintenance contracts)
Case 2: HOL	353 – construction, mining, and materials handling	National market in Western Europe	Variety of different product segments; some pre-sales services (consultation, engineering), but only few after service offerings (low maintenance products)
Case 3: VOE	353 – construction, mining, and materials handling	National market in Central Europe	Standardized as well as customized products (custom built machinery); only very basic service offerings
Case 4: WES	355 – special industry machinery, except metalworking	Worldwide	Variety of different product and service offerings; despite firm's tradition in manufacturing specialized machinery, wide range of service offerings
Case 5: KRA	353 – construction, mining, and materials handling	Central and Eastern Europe	One main core product that is accompanied by service offerings (e.g. installation, maintenance); additional service offerings that are independent from product sales
Case 6: MOE	349 – miscellaneous fabricated metal products	Central Europe	One core product (standardized as well as customized versions); variety of service offerings; additional complementary product-and service offerings provided by network partners
Case 7: PRE	354 – metalworking machinery and equipment	Europe	Core product: special-purpose machinery; additionally more standardized products; only few service offerings that are linked to core product
Case 8: TEM	356 – general industrial machinery and equipment	Central and Eastern Europe	Non-standardized products manufactured according to customer specifications; very few service offerings
Case 9: MES	354 – metalworking machinery and equipment	Worldwide	One core product offering; customization possible; wide range of service offerings (e.g. maintenance and repair, rental, financial services)
Case 10: WIN	355 – special industry machinery, except metalworking	Europe	Project-based business with a strong focus on service offerings (ranging from rather small engineering services up to management of large engineering projects)
Case 11: GLS	344 – fabricated structural metal products	Western Europe	Different product categories from very simple to highly specialized offerings; only few service offerings (e.g. logistics, installation)
Case 12: STO	344 – fabricated structural metal products	National Market in Central Europe	Highly customized products; no distinction between products and service, but provision of integrated solutions
Case 13: SLI	344 – fabricated structural metal products	Worldwide	Project-based business with strong focus on services (especially engineering and consulting)

Case 14: MDM	346 – metal forgings and stampings	National Market in Central Europe	Customized product offerings; only few service offerings (consultation); basic after sales services (e.g. installation) are provided by network partners
Case 15: LUX	349 – miscellaneous fabricated metal products	Europe	Project-based business; highly customized product offerings and wide range of services (e.g. installation, maintenance, trainings)
Case 16: IGL	355 – special industry machinery, except metalworking	Central Europe	Core product consists of several components that are combined to customized solutions; wide range of product-related services (e.g. maintenance, rental, financial services)
Case 17: TOR	356 – general industrial machinery and equipment	National Market in Central Europe	Highly customized product that is accompanied by services; service offerings are not sold separately, but are integrated in product offerings

Table 4.3-1: Sample description.
Source: Own illustration.

Data collection took place between December 2013 and May 2015. We used two main data sources: (1) We conducted semi-structured interviews as they are especially useful to gain insights from people that experience the phenomenon of interest (Gioia et al., 2013). (2) We analyzed a vast amount of archival data covering documents such as annual reports, firm websites, and other material provided by the informants (e.g. newsletters to customers and employees).

Each in-depth interview lasted between 60 and 120 minutes. In order to ensure informant competence (Kumar, Stern, and Anderson, 1993) our key informants were CEOs. In contrast to other firm representatives, CEOs are allowed and able to provide insights into the firm's strategic acting. Furthermore, they are also in a position to provide detailed information on realized strategies reflected in the firm's business model design. However, we were not interested in collecting individual perceptions of the CEOs but approached the CEOs as a source of knowledge related to the overall firm. All interviews were based on an interview guideline that was developed in line with suggestions from literature (Eisenhardt, 1989; Gioia et al., 2013; Yin, 2009). This interview guideline reflected insights from existing literature, particularly Amit and Zott's (2001) business model understanding. However, we did not operationalize constructs or thought about any relation of variables in advance. Moreover, our interview questions were rather broad so that interviewees had the opportunity to discuss the topic of interest openly. Furthermore, we allowed for alterations of the interview guideline as our research progressed (Eisenhardt, 1989; Gioia et al., 2013; Yin, 2009). The interviews took place at the premise of the particular case firm with two investigating researchers present – one handling the interview questions, the second making general observations and taking minutes (Eisenhardt, 1989).

After synthesizing interview data and archival data, several follow-up phone calls with the interviewed CEOs were conducted to clarify any inconsistencies between the two data sources as well as to collect additional data necessary in the context of our research. By doing so, we triangulated data and gained a broader and more objective overview of the case firms' activities. Thereby, we were able to strengthen the validity of our research (Gibbert, Ruigrok, and Wicki, 2008; Yin, 2009).

4.3.3.3 Data Analysis

Basis of our data analysis are two separate coding procedures. These coding procedures were applied to interview data and archival data to condense it and to enhance its meaning (Miles and Huberman, 1994). The first coding procedure was based on a tentative set of expected codes (Strauss and Corbin, 1990). These expected codes resulted from the definition of the business model design elements content, structure, and governance provided by Amit and Zott (2001). We looked for specifications of content, structure, and governance in a manufacturing firm context so that our findings refer to Amit and Zott (2001), but are in detail independent from the insights Amit and Zott (2001) gathered with regard to an e-business setting. To avoid being limited by insights from prior research and to allow for new ideas to emerge, we applied a second, open coding procedure to our data following suggestions by Gioia et al. (2013). The first as well as the second coding procedure were conducted by the authors independently. We compared the results of the codings to avoid misinterpretations and to check for reliability (Miles and Huberman, 1994). In no instance was there a conflict between the independent coding results of the authors. Therefore, we are confident that the results of the coding procedures are reliable.

The results of both coding procedures were combined in write-ups for each individual case. These write-ups were further enriched by selected quotes as well as tables providing key facts about the individual case firms. Against this background, we conducted a thorough within-case analysis which allowed us to gain an in-depth understanding of each case firm's currently applied business model design and the reasons that made the firm choose this specific business model design. In a next step, we searched for patterns across cases following suggestions by Eisenhardt (1989) and Yin (2009). In particular, we looked whether analogies exist among the different cases with respect to the various business model designs identified in the within-case analysis. We grouped case firms that show similarities and checked inter-group differences as suggested by Eisenhardt (1989). We used replication logic

and checked rival explanations as suggested by Yin (2009) to refine identified patterns and to elaborate emerging propositions. To be in line with systematic combining (Dubois and Gadde, 2002), we also included insights from existing literature into our analysis and went back to the original data in order to ensure accuracy between literature, empirical data, and emerging theory.

All in all, data analysis provided in-depth information on different types of business model designs as well as reasons why manufacturing firms employ a specific business model design as a result of product-service transition. In a last step, we presented our final results to the interviewed CEOs in order to double check and refine them.

4.3.4 Case Study Results

Against the background of our case data, we are able to identify specifications of the business model design elements content, structure, and governance manufacturing firms employ in the context of product-service transition. The insights presented in table 4.3–2 depict the results of the first coding procedure that was based on a tentative set of expected codes.

Business model design elements (Amit and Zott, 2001; Zott and Amit, 2010)	**Business model design element definitions** (Amit and Zott, 2001: 514)	**Business model design element specifications** (case data)
Content	Information and goods [offerings] that are being exchanged	▪ Exchange of transaction-related information with network partners ▪ Exchange of information regarding customers experience and user behavior ▪ Exchange of market-related information with network partners ▪ Exchange of relationship-related information with network partners ▪ Highly standardized product offerings ▪ Adjustment of standardized product offerings to customer needs ▪ Highly customized product offerings tailored to customer needs ▪ Basic service offerings (e.g. delivery and assembly) ▪ Advanced service offerings (e.g. engineering, maintenance and repair) ▪ Stand-alone service offerings (e.g. financial services, trainings, consulting)
	Resources and capabilities that are required to enable the exchange	▪ Value creation based on firm-internal resources and capabilities ▪ Value creation based on an integration of network partner's resources and capabilities ▪ Technological capabilities as precondition for network partner exchange ▪ Shared interaction capabilities as precondition for network partner exchange

Structure	Network size	▪ Small network consisting of core business partners ▪ Small network consisting of core business partners; additionally enhanced network consisting of loosely coupled further business partners ▪ Exaggerate network; integration of direct and indirect (e.g. customers of customers) business partners ▪ Large network consisting of direct and indirect business partners as well as research institutions, and government agencies
	Ways in which parties are linked and exchanges are executed	▪ Network linkages based on personal relations ▪ Network linkages based on professional relations ▪ Exchanges based on ad-hoc interactions ▪ Exchanges based on shared standards and predefined processes ▪ Technology-enabled exchanges (e.g. smart systems)
	Order and timing of exchanges	▪ Exchange in a dispersed network controlled by the focal firm ▪ Free exchange within a dense network ▪ Single transaction-based exchange with network partners ▪ Continuous exchange with network partners ▪ Network exchange initiated by focal firm ▪ Network exchange initiated by network partners
	Market mechanisms	▪ Direct interaction between the focal firm and its network partners ▪ Interaction between the focal firm and its network partners fostered by third party intermediaries ▪ Focal firm provides and manages a platform for exchange between various network partners
	Flexibility and adaptability of transaction structure	▪ Rigid transaction structures within the network ▪ Highly flexible transaction structures within the network
Governance	Locus of control of flows of information, goods, and finances	▪ Centralized supervision of relationships with network partners by focal firm ▪ Delegation of responsibilities within the network
	Nature of control mechanisms, e.g. trust and incentives	▪ Utilization of formal governance mechanisms, e.g. contracts, guidelines, guarantees ▪ Utilization of informal governance mechanisms, e.g. trust, network culture ▪ Extrinsic incentives (e.g. financial benefits, privileges related to the supply with firm offerings) motivate active participation in value creation processes ▪ Intrinsic incentives (e.g. empowerment, quality of relationship)motivate active participation in value creation processes

Table 4.3-2: Manufacturing firm business model determinants in the context of product-service transition: Results of the first coding procedure.
Source: Own illustration.

We made use of the business model design elements and the definitions of these elements provided by Amit and Zott (2001) as basis of our first coding procedure. Our manufacturing firm setting does not allow for transferring business model design element specifications identified by Amit and Zott (2001) in the context of e-businesses. Therefore, we

independently looked for business model design element specifications that are in line with the definitions provided by Amit and Zott (2001). As a consequence, the business model design element specifications we present are novel. They provide a variety of choices how to configurate business model design elements of manufacturing firms in the context of product-service transition.

When having a detailed look at the business model design element configurations employed by manufacturing firms in the context of product-service transition, we found two interesting aspects. First, we identified four different configurations for each business model design element. Interestingly, our case data reveals that these business model design element configurations cannot be freely combined. We found only four business model designs that are of relevance for manufacturing firms in the context of product-service transition. Second, according to our case data, each of the four identified business model designs of manufacturing firms is determined by one specific, different dominant source of value creation. This dominant source of value creation transcends into each business model design element. This finding stands in contrast to Zott and Amit (2007) who argue that a business model design can draw on multiple sources of value creation at the same time. When analyzing the four sources of value creation that are of relevance for manufacturing firms in the context of product-service transition, we see that they can be explained by four different theoretical approaches, namely transaction cost economics, resource-base view, network theory, and Schumpeterian innovation. This finding is similar to Amit and Zott (2001) who show that the same theoretical approaches explain the sources of value creation in e-business and characterize four different business model design themes (efficiency-centered, complementarities-centered, lock-in-centered, and novelty-centered design theme). Hence, we are able to transfer these design themes to our research setting. Table 4.3–3 provides a description of business model design element configurations and respective sources of value creation related to our research setting.

Configurations of business model design elements			Source of value creation ↓ *Business model design theme*
Content	**Structure**	**Governance**	
▪ Strong focus on product business; services offered only to a limited extent ▪ Exchange of information related to single transactions; exchange with network partners reduces information asymmetries and enhances transparency ▪ Network partners' resource input (ideas, feedback) is considered only to a limited extent	▪ Standardization of processes is a main objective ▪ Either just in time production or scalability of transaction volume in order to decrease transaction costs; high degree of capacity utilization ▪ Network partners are not actively integrated in value creation process	▪ Strong focus on formal governance mechanisms ▪ Contracts are a necessary precondition for any transaction in order to enhance transparency and to reduce risks ▪ No specific incentives to motivate network partners to participate in value creation processes	Focus on reduction of transaction costs ↓ *Efficiency-centered business model design*
▪ Product business of central importance; service add-ons that enhance value of product offerings ▪ Combination of product- and service-related resources and capabilities ▪ Utilization of network partner resources and capabilities only to a limited extent	▪ Product business and service business is heavily interwoven (e.g. same business units responsible for product offerings as well as service offerings) ▪ Cross-selling of product and service offerings ▪ Network partners are integrated in value creation processes only if necessary	▪ Strong focus on formal governance mechanisms ▪ Contracts are a necessary precondition for any transaction in order to enhance transparency and to reduce risks ▪ If incentives are offered to motivate network partners to participate in value creation processes, they are extrinsic in nature	Focus on synergies between product business and service business ↓ *Complementarities-centered business model design*
▪ Strong focus on product business; basic service offerings ▪ Highly customized products; strong focus on customer needs; hence, intense exchange of information ▪ Trust is promoted through extensive exchange of relationship-related information	▪ Strong focus on integration of network partners in value creation processes ▪ Network linkages based on personal relations ▪ Learning investments made by all network partners; knowledge about and enhancement of each other's capabilities enable repeat transactions	▪ Strong focus on informal governance mechanisms; formal governance mechanisms are rarely utilized ▪ Network linkages are enhanced through mutual support and loyalty ▪ Intrinsic incentives (based on community concept) motivate network partners to actively participate in value creation processes	Focus on network partner retention ↓ *Lock-in-centered business model design*

▪ Product- and service-related offerings are combined and aligned to provide optimal value to customers ▪ Continuous improvement of existing offerings according to feedback from network partners ▪ Continuous development of new capabilities based on exchange with network partners	▪ Strong focus on integration of network partners in value creation processes ▪ Network linkages based on professional relations; personal relations are less important ▪ Linkages among network partners highly flexible and can easily be adjusted to new market conditions	▪ Combination of formal and informal governance mechanisms to optimize knowledge exchange and knowledge creation within the network ▪ Extrinsic as well as intrinsic incentives are utilized to motivate network partners to actively participate in value creation processes ▪ Network partners are allowed to influence focal firm's processes and standards	Focus on innovative ways of value creation ↓ *Novelty-centered business model design*

Table 4.3-3: Configurations of manufacturing firm business models in the context of product-service transition. **Source:** Own illustration.

Against the background of our results, we propose:

Proposition 1: Business model designs manufacturing firms employ as a result of product-service transition are determined by one dominant source of value creation that becomes manifest in each business model design element.

In a next step, we were interested in uncovering factors that explain different approaches to product-service transition that are reflected in manufacturing firms' business model design choices. An open coding procedure revealed that two service-related dimensions – *service intensity* and *service attitude* – determine how manufacturing firms design their business models as a result of product-service transition. Details on the open coding procedure and the identified service-related dimensions are presented in table 4.3–4.

1st order concepts	2nd order themes	Aggregate dimensions
▪ Customers expect services as prerequisite to buying a product ▪ Services are industry standard ▪ Services do not allow for differentiation	Basic services as means to prevent a decrease of value generation	*Service intensity*
▪ Services are inseparably linked to product offerings ▪ Services enhance value of product offerings ▪ Services allow for creating a competitive advantage by means of differentiation	Add-on services as means to enhance product-based value generation	
▪ Services go beyond product business ▪ Services support customers actions ▪ Services offer an opportunity for diversification	Stand-alone services as means to enhance value generation	

▪ Willingness to share information with network partners ▪ Willingness to react to network partner requests ▪ Willingness to learn from network partners ▪ Willingness to jointly develop new offerings with network partners	Degree of openness toward network partners	*Service attitude*
▪ Development of knowledge integration mechanisms ▪ Empowerment of employees to facilitate network partner collaboration ▪ Transfer of capabilities to network partners to facilitate collaboration ▪ Implementation of reciprocal learning processes to improve network partner collaboration	Degree of availability of mechanisms to integrate network partners	
▪ Proactively approaching network partners ▪ Acting as a role model for network partners ▪ Establishment of norms and values for network partner collaboration ▪ Orchestration of network relations	Degree of influence on network development	
▪ Abstaining from opportunistic behavior toward network partners ▪ Development of an understanding for value creation processes of network partners ▪ Agreement on ethical guidelines on a network level ▪ Improvement of overall value creation processes for the benefit of all network partners	Distribution of benefits among network partners	

Table 4.3-4: Service-related influence factors on business model design choices of manufacturing firms in the context of product-service transition: results of the second coding procedure.
Source: Own illustration.

The service intensity dimension refers to the strategic importance of service offerings in terms of their contribution to value generation. The more emphasis firms place on service intensity, the more these firms seize opportunities to unlock new sources of value generation by providing services that enhance the value of their products or generate value on their own. This approach is in line with service management literature (Antioco et al., 2008; Gebauer et al., 2005; Oliva and Kallenberg, 2003) that encompasses a unidimensional perspective on product-service transition.

However, service intensity is not the only dimension manufacturing firms have to regard when pursuing product-service transition. Our findings reveal that service attitude is a second strategic dimension that is of relevance in this context. Service attitude describes a firm's mindset in terms of how to collaborate with network partners. It is important to understand that this dimension is different from concepts such as service orientation (e.g. Homburg, Hoyer, and Fassnacht, 2002; Lytle, Hom, and Mokwa, 1998) or customer orientation (Narver and Slater, 1990; Slater and Narver, 1998) as these concepts do not encompass a network perspective (Hunt and Lambe, 2000). Our understanding of service attitude can be associated

with explanations given by researchers (e.g. Priem, 2007; Karpen et al., 2012) who emphasize the need to change the underlying firm mindset in order to enhance value generation. According to our findings, firms show either a high or a low service attitude. This can be explained by the fact that service attitude represents a firm's mindset that is deeply enrooted in the firm so that changes only have an impact when they are of substantial nature.

The influence of service strategy on the business model design of manufacturing firms in the context of product-service transition is determined by the emphasis manufacturing firms place on the two dimensions service intensity and service attitude. Four groups have to be distinguished:

(1) One group of case firms (GLS, HOL) does not follow a distinct service strategy, which can be observed based on the low emphasis these firms place on service intensity as well as service attitude. Therefore, the strategic actions of these firms are driven by needs of the product business. The very little emphasis these firms place on service intensity and service attitude delimits opportunities to gain a competitive advantage that is based on differentiation. Hence, competition is in this context mainly based on costs – an aspect we clearly see in our sample. While experiencing a need for adequately coping with cost-based competition, case firms belonging to this group aim at generating benefits based on economies of scale. Furthermore, they strive for controlling as many steps of the value creation processes as possible to reduce interactions with network partners – a behavior that results from the low service attitude. The strategy of these firms that is characterized by the reduction of production costs and transaction costs is reflected in an efficiency-centered business model.

(2) Another group of case firms (IGL, KRA, MAH, WIN) follows a service strategy that is characterized by the objective to benefit from a service business that is closely linked to the product business. This basic strategy becomes apparent in a high emphasis these firms place on service intensity and a low focus on service attitude. Firms belonging to this group base their strategy on the insight that it is possible to enhance competitiveness based on combining available resource and capabilities in new ways. In doing so, these firms create synergies and thereby enhance the value of their resources and capabilities by opening new opportunities for generating value. The need for securing access to and control of resources and capabilities in order to generate a sustainable competitive advantage based on the recombination of resources and capabilities prevents these firms from enhancing their resource base or developing new capabilities by interacting with network partners. This way of acting is

related to the low service attitude that is prevalent in these firms. The strategy of these firms becomes manifest in a complementarities-centered business model.

(3) A different type of service strategy is employed by another group of case firms (MDM, PRE, TEM, TOR, VOE). These case firms build their strategy on the basic idea of increasing stability and enhancing the continuity of network partner relations. They transform their basic strategic focus into a high attention paid to service attitude and a low focus on service intensity. Service is by these firms understood as enabler to increase product sales and works as means to intensify network ties. A higher network density crystallizes in an improved competitive position as it reduces the possibility that network partners search for new business opportunities and terminate the ones they already exploit. The service strategy of firms belonging to this group does not necessarily lead to the development of a service business as service is mainly a kind of wrapping for products and has no or only very little impact on value generation on its own. Accordingly, the service strategy of this group of firms leads to making use of a lock-in-centered business model.

(4) A last group of firms in our sample (MES, MOE, LUX, SLI, STO, WES) makes use of a service strategy that is built on the willingness to look for new business opportunities, no matter whether these opportunities match the extant value creation logic of these firms. Firms of this group are willing and able to question and, if necessary, to redefine their extant value creation logic with the aim to innovate and improve firm value generation. Their focus on innovation goes along with an equally high service intensity and service attitude. The service strategy of this group of firms is reflected in a novelty-centered business model.

Figure 4.3–2 summarizes our findings related to the influence of a manufacturing firms' service strategy on the business model design employed in the context of product-service transition.

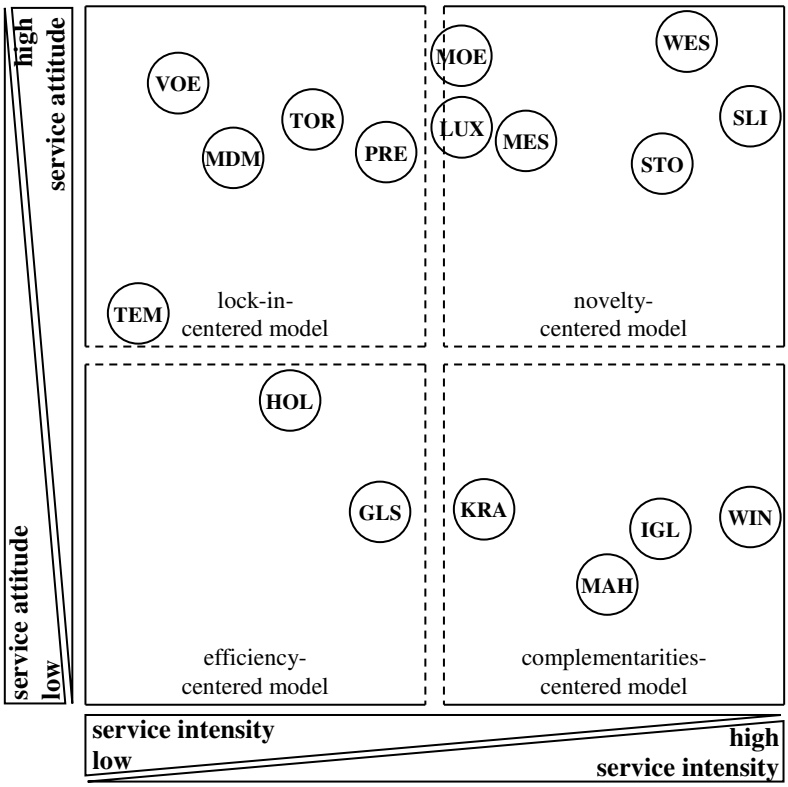

Figure 4.3-2: Business model classification scheme.
Source: Own illustration based on case data.

Against this background we propose:

Proposition 2a: The emphasis manufacturing firms place on service intensity influences the choice of the business model design in the context of product-service transition.

Proposition 2b: The emphasis manufacturing firms place on service attitude influences the choice of the business model design in the context of product-service transition.

Proposition 2c: Service intensity and service attitude are not mutually exclusive.

Although we found evidence that only one dominant source of value creation explains the business model design choice of manufacturing firms in the context of product-service transition, we observe that the respective business model designs the firms employ as a consequence of the chosen source of value creation slightly differ in terms of content, structure, and governance. This allows for the assumption that the boundaries between an efficiency-centered, complementarities-centered, lock-in-centered, and novelty-centered

business model are not perfectly selective – an insight that is basically in line with Zott and Amit (2007). However, this insight needs to be backed up with further information. As we were not able to explain this finding based on the condensed cross-case data, we went back to the original individual case data to look for patterns that can be of use in understanding the observed slight differences in the design of the business model elements in the context of product-service transition that occur despite only one source of value creation being of relevance for each case firm. The data revealed that the differences are caused by the extent the implemented business model designs match the case firms strategies. Following this train of thoughts, three different groups of case firms can be distinguished:

Case firm group I consist of firms (MDM, SLI, STO, TOR, WES, WIN, VOE) characterized by a business model design that shows a high degree of external and internal fit. External fit is determined by the extent to which the employed specifications of the business model elements content, structure, and governance match ecosystem conditions and are therefore a useful operationalization of the firm strategy. Internal fit is determined by the coherence of the business model design elements content, structure, and governance. Both aspects are of relevance as they account for the stability of the employed business model design. The CEO of TOR explained:

> *"We are quite dependent on our customers. We operate in a very price-driven market and need to comply with customer demands. However, over time we established relationships to specific key customers that allow for a close collaboration. Those customers are the ones that not only provide the best profits, but also important information."*

He emphasized that his firm is not in a position to determine structures and exchange processes as TOR does not have the bargaining power to do so. However, being familiar with market conditions that are temporarily stable allows TOR to run a well-proven business model that is free from inconsistencies. The CEOs of the case firms MDM, VOE, and especially WES brought forward the same argument. The CEO of WES exemplified:

> *"We know the different players in our business ecosystem very well. We know that we are capable at providing a variety of different offerings by ourselves. However, we know that in some cases we have to rely on specific specialists in order to best match the*

customer needs – even if this means integrating offerings provided by direct competitors into the overall package. In the end, usually all involved parties benefit."

Following the logic of the abductive approach we employ in this paper, we mirrored the insights gathered related to case firm group I with prior literature. In contrast to Cusumano et al. (2015), we observe that in a mature industry service offerings provided by firms considerably differ so that there seems to be no "best practice" to respond to a distinct specification of ecosystem conditions. The firms in group I differ in terms of the employed business model. However, the employed business models are according to the CEO statements stable and currently not in a flux. This is remarkable as it points to the existence of differences in how manufacturing firms can successfully respond to product-service transition. A manufacturing firm strategy toward product-service transition seems to be on the one hand determined by firm bargaining power; an insight that is supported by Zott and Amit (2007; 2008). On the other hand, network centrality needs to be taken into account as it influences access to information – an aspect Lechner, Frankenberger, and Floyd (2010) as well as Salk and Brannen (2000) already discuss. Moreover, the importance of capabilities has to be highlighted as especially the case of WES shows that successfully responding to product-service transition may be enabled by network partner resources and capabilities – an insight that is closely linked to the findings of Afuah (2000).

Against this background we state:

Proposition 3a: In the context of product-service transition, manufacturing firms employ business models that are characterized by a high internal and external fit. These business models are stable over time.

Case firms belonging to group II (HOL, KRA, MES, MOE, LUX) currently employ a business model design that is highly suitable for the ecosystem conditions these firms experience. However, our case data provides evidence for a lack of internal fit of these business models. For these case firms the configurations of the business model design elements content, structure, and governance are according to our case data basically in line with the dominant source of value creation. However, the firms seem to be affected by a shadow of the previously employed business model design that manifests in a deviation from the standard designs of content, structure, and governance we observe related to manufacturing firms in the context of product-service transition. Although we did not collect

longitudinal data, the statements of the CEOs of the case firms belonging to group II allow for the assumption that these case firms recently changed their strategy with respect to the main source of value creation. This strategic change is by now not perfectly reflected in the business model design as the business model is not finally settled and adjustments of content, structure, and governance still take place. The CEO of MOE stated:

> *"Realizing strategic changes and implementing new ways of doing business takes time. Especially employees need to be open-minded towards change – and sometimes even our business partners. I know that we have yet to reach our goals. Sometimes it's a struggle and there are setbacks, but overall I think that we are on a good way."*

He further explained that a successful change of strategy calls for breaking free from long-established routines and very often requires an acquisition and development of new resources and capabilities. Therefore, a transformation phase is most likely to happen. This transformation phase that is caused by barriers to strategic change is reflected in the lack of internal fit of the business model the case firms of group II employ.

Our insights are supported by prior literature (e.g. Capron and Mitchell, 2009; Kraatz and Zajac, 2001) that already points to the existence of barriers to strategic change. In the context of product-service transition, especially cognitive barriers seem to be of importance (e.g. Fischer et al., 2010; Kowalkowski et al., 2012). Chesbrough (2010) points to the importance of cognitive barriers related to business model change. He states that managers' information processing and decision making processes are influenced by prior success of established business models. Hence, business model redesign takes time – an insight that is also supported by McGrath (2010). We observe the same phenomenon. However, related to our study it is important to highlight that we do not focus on an individual-level of analysis so that we are only able to discuss cognitive barriers on an aggregated level.

Taking these insights into account we propose:

Proposition 3b: In the context of product-service transition, manufacturing firms experience a transformation phase where they temporarily employ business models that are characterized by a high external fit and a limited, but still considerable internal fit. These business models are

subject to adjustments and converge into business models that are stable over time when a high internal fit is achieved.

Group III consist of case firms (GLS, IGL, MAH, PRE, TEM) that employ a business model design characterized by a lack of external fit and/or internal fit. Our case data reveals that two reasons account for making use of an inadequate business model design related to the case firms subsumed in group III. The case firms GLS and PRE lack external fit in their business models. This lack of external fit results from the fact that these firms to not have a planned strategy at all or attempt to operationalize a strategy that is not suitable for the prevailing ecosystem conditions. The business models employed by these case firms may show a high degree of internal fit. However, this does not qualify these business models as an adequate reply to product-service transition due to their emergent nature or a linkage to an unprofitable strategy. The CEOs of GLS and PRE, for example, complained about difficulties to create revenues out of their service business that stem from a lack of willingness of customers to pay for service offerings, which points to the relevance of a lack of external strategic fit and following business model fit in these cases. The CEO of GLS explained:

> *"We tried to offer services for a fee. However, we never accomplished to motivate our customers to pay for these services. Instead, customers criticized this practice and demanded receiving services for free. Hence, we stopped increasing our portfolio of service offerings or even removed specific services from our portfolio of offerings in order to decrease costs."*

In contrast, the case firms IGL, MAH, and TEM are negatively affected by a lack of internal business model fit. Even though their strategies seem to be highly suitable to respond to ecosystem conditions, a lack of ability to design the business model elements in a coherent way prevents these firms from adequately dealing with product-service transition. An explanation for this lack of coherence could be that the firms are affected by structural inertia. This insight is exemplified by a statement of the CEO of MAH. He told us:

> *"It is frustrating. Whether I turn the steering wheel or not, the vessel sails straight ahead."*

Taking into account existing literature as our abductive way of proceeding requires, we find support for the importance of a fit between ecosystem conditions and the employed strategy

(e.g. Venkatraman, 1989; Zajac et al., 2000). However, this is basically not surprising but a new insight related to the choice manufacturing firms make on the business model design in the context of product-service transition. We propose:

Proposition 3c: A lack of fit between firm strategy and ecosystem conditions is reflected in a manufacturing firm business model that is not suitable for dealing with product-service transition.

Literature on structural inertia (Hannan and Freeman, 1984; Kelly and Amburgey, 1991) supports our reasoning related to the lack of an internal business model fit. In this context, the work of Tushman and O'Reilly (1996) has to be highlighted as they point out that firms that have been very successful in the past – which especially applies to MAH – often rely on structures and institutionalized values and norms that are linked to their initial source of success. By doing so, these firms are likely to experience structural inertia which paves the way for manufacturing firms to make use of a business model that lacks internal coherence and can therefore not successfully be utilized in the context of product-service transition. We propose:

Proposition 3d: A persistence in a business model that lacks internal fit leads manufacturing firms to make use of a business model that is not suitable for dealing with product-service transition.

4.3.5 Discussion and Conclusion

Our paper provides a new perspective on manufacturing firm service strategies in the context of product-service transition and sheds light on how these strategies are realized in the firms' business models. We depart from the business model understanding provided by Amit and Zott (2001; see also Zott and Amit, 2010), but transfer their business model understanding that emerges from an e-business research setting to a new manufacturing firm research context. As a result, we uncover how manufacturing firms design the business model elements content, structure, and governance in the context of product-service transition. The identified business model specifications are considerably different from the ones Amit and Zott (2001) describe based on their e-business research setting. However, although the specifications differ, the sources of value creation we found are the same Amit and Zott (2001) highlight related to their different research setting. Our case data provides no

indication for the relevance of further sources of value creation in the context of organizing value creation activities. This insight is remarkable as it provides evidence that only four basic sources of value creation seem to influence the design of business models irrespective of the industry we look at. However, we see in contrast to Amit and Zott (2001) that in our research setting the design of the business model elements follows only one dominant source of value creation that is coevally translated into the content element, the structure element, and the governance element of the business model.

Furthermore, our study discloses that manufacturing firms deal with product-service transition in different ways which is reflected in the utilization of business models designs that follow different sources of value creation. Our study clearly reveals that the employed business model design in the context of product-service transition is determined by the service strategy a manufacturing firm establishes. Although researchers (e.g. Casadesus-Masanell and Ricart, 2010; DaSilva and Trkman, 2014) discuss the interrelation between strategy and business model design in theory, there is still a lack of clear empirical evidence in this context (Cortimiglia et al., 2016). We reduce this research gap and contribute to a better understanding of the relation between strategy and business models.

Related to product-service transition, our findings are of particular interest as we show that service strategies of manufacturing firms are not unidimensional. We expose that a manufacturing firm's service strategy is reflected in the firm's emphasis on the two dimensions *service attitude* and *service intensity*. Hence, manufacturing firms do not move along a product-service continuum (see e.g. Oliva and Kallenberg, 2003; Neu and Brown, 2005) that ranges from provision of product offerings to a provision of service offerings. Instead, different strategies are viable and can result in the implementation of different stable business models. Thus, our case data does not indicate a convergence toward a "best practice" business model design. This result of our study backs up Kowalkowski et al. (2015), who call for a more differentiated perspective on product-service transition. Moreover, according to our case data the services manufacturing firms provide are considerably diverse. We do not see a dominance of a specific type of service offerings in our sample that consist of manufacturing firms closely linked to only one specific industry. Thus, our results form a sharp contrast to Cusumano et al. (2015) who argue that the industry lifecycle has an influence on the type of service offerings of manufacturing firms.

This line of reasoning is supported by an additional insight we were able to gather. In terms of designing a business model that is suitable to adequately deal with product-service transition, manufacturing firms need to pay special attention to the business model fit. The external fit between strategy and ecosystem conditions has been widely discussed over the last decades (see e.g. Yamakawa et al., 2011; Zajac et al., 2000). As the business model is a reflection of a firms' strategy, it is not surprising that it also needs to match ecosystem conditions. Therefore, business models need to be changed over time as a dynamic external strategic fit (Zajac et al., 2000) is necessary. Though, our study uncovers that the degree of internal fit of the business model needs also to be considered. Achieving external business model fit is important; but it does not guarantee success on its own. Without a distinct internal business model fit even a strategy that perfectly matches ecosystem conditions and a business model that is line with this strategy can be useless. However, we need to highlight that our study is not based on longitudinal data so that we cannot examine the role of external and internal business model fit related to change processes that take place over time.

Business model literature (e.g. Casadesus-Masanell and Zhou, 2013; McGrath, 2010; Khanagha et al., 2014) points to the importance of new market players when it comes to the introduction of differing business model designs in well-established markets. New market players come up with new business model designs that are later on copied by incumbent firms. This could serve as an explanation why we observe differences in the business model designs our sample firms make use of. However, our sample only includes established market players which per se delimits the relevance of this explanation. Moreover, our case data clearly indicates that manufacturing firms normally design their business models based on a defined strategy so that imitation of a competitor's business model does not seem to play a role in this context.

The results of our study are particularly interesting for managerial practice. We show several options how manufacturing firms can successfully deal with product-service transition. To choose a suitable option, manufacturing firms need to be aware of external conditions as well as to be informed about firm-internal capabilities. It is of utmost importance to align both aspects as otherwise the established service strategy may be unsuccessful. In contrast to existing product-service transition literature (e.g. Fang et al., 2008; Gebauer et al., 2005; Oliva and Kallenberg, 2003), we advocate that solely increasing the amount of service offerings is not always the right way for manufacturing firms to ensure survival in turbulent

times of market change. It can be much more promising to enhance the embeddedness of network partners – especially customers – which can contribute to the emergence of a specific market niche that opens up new strategic opportunities. Nevertheless, manufacturing firms should not forget that changing or implementing a business model is a highly complex task (Mezger, 2014). To successfully manage this challenges, specific problem solving capabilities (Helfat and Peteraf, 2015) as well as a set of service-related operational capabilities (Ulaga and Reinartz, 2011) that is suitable to support the strategic choice of the manufacturing firm how to approach product-service transition is a necessary precondition which may depict a serious obstacle to product-service transition.

Our results call for future research that encompasses a processual perspective and contributes to a better understanding of how product-service transition related business model changes evolve over time. Furthermore, a look at performance effects of different business model designs in the context of product-service transition could provide interesting insights. We encourage researchers to take on where we have left off and hope that our insights may foster future research focusing on the interesting topic of product-service transition triggered business model change.

4.4 Path Dependence as a Barrier to Business Model Change in Manufacturing Firms: Insights from a Multiple-case Study[4]

Abstract

Business model change processes are a still underresearched phenomenon. Especially barriers to business model change and in this context path dependence of business models lack a deeper understanding. We address this issue by examining business model change processes of manufacturing firms that pursue service transition against the background of a multiple-case study. The contribution of our paper is twofold: (1) We show how business model change processes take place in detail. In doing so, we considerably enhance business model literature that employs a processual perspective on business model change. (2) Our findings allow for a new perspective on business model change as we provide empirical evidence that path dependence needs to be considered in this context. We are able to identify determinants and mechanisms that influence to which extent path dependence affects business model change processes. Hence, we enrich business model literature by applying the path dependence concept on a business model level.

Keywords: Business model change; path dependence; service transition; manufacturing industry; multiple-case study.

4.4.1 Introduction

During the last decade business models have become an increasingly important topic for research (Schneider and Spieth, 2013; Zott et al., 2011) as well as for managerial practice (IBM Global Business Services, 2006; Lindgardt et al., 2009). Quickly changing ecosystem conditions (Casadesus-Masanell and Zhu, 2013; Teece, 2010) that are triggered by technological innovation (Chesbrough, 2010; Magretta, 2002; Teece, 2010) force firms more and more to think outside the box and following to redesign their way of doing business. In this context, adjusting internal structures and processes is not enough as effectively dealing with these ecosystem changes also calls for redefining firm-external relations (Amit and Zott,

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2012; Chesbrough, 2011). Therefore, firms are challenged to adjust their business model in order to be able to commercialize on new market conditions.

However, changing the business model may not be an easy task for firms as the change process is likely to be affected by the extant business model that influences possible transformation patterns (McGrath, 2010). In other words: managerial decisions made in the past very often still cast a shadow on the firms' scope of action related to business model change (Chesbrough and Rosenbloom, 2002, DaSilva and Trkman, 2014). Nevertheless, by now this aspect has not been researched sufficiently. Research (e.g. Cavalcante et al., 2011; McGrath, 2010) only mentions path dependence as side aspect and especially fails to define what path dependence of business model change really is. We aim at closing this research gap by explicitly analyzing business model change against the background of path dependence.

Our research is embedded in a manufacturing industry setting as we assume that business model change follows different rules in different industries. Especially manufacturing firms are recently challenged by a need to change their business model. Literature (e.g. Kindström et al., 2013; Ulaga and Loveland, 2014) points to an ecosystem-driven need for manufacturing firms to change their value creation processes by shifting their traditional product focus in the direction of a more service-oriented perspective on how to do business. This so-called service transition results in a need for business model change. Researchers already refer to well-known firms such as Rolls Royce (e.g. Neely, 2008; Ng et al., 2012), IBM (e.g. Amit and Zott, 2012; Chesbrough, 2007a; 2011), or Xerox (e.g. Chesbrough, 2007a; Chesbrough and Rosenbloom, 2002) in order to exemplify the relevance of business model change for manufacturing firms that undergo a service transition process. Therefore, a manufacturing industry setting is especially suitable to analyze business model change processes in detail.

Furthermore, according to literature (Gebauer et al., 2005; Ulaga and Reinartz, 2011) only a few manufacturing firms are able to benefit from implementing service-focused strategies and following from redesigning their business models. Business model change is often a process that is driven by experimentation and trial-and-error learning (Khanagha et al., 2014; McGrath, 2010; Sosna et al., 2010). Moreover, experimenting with new business model designs requires resources as implementing a new business model design is costly and time-consuming (Bohnsack, Pinkse, and Kolk, 2014; Sosna et al., 2010). Researchers (e.g. Chesbrough, 2010; Chesbrough and Rosenbloom, 2002) emphasize that cognitive constraints

of managers prevent firms from changing their business models that have been successful in the past and lead these firms to being trapped in inappropriate business model designs. Manufacturing firms very often mainly exploit existing capabilities (Ulaga and Reinartz, 2011) although they need to develop new service-related capabilities to follow a service transition (Neely, 2008; Neu and Brown, 2005). All these aspects point to path dependence as determinant of business model change in the context of manufacturing firms and therefore also support the choice of our research setting.

Against this background we ask: *(1) How do manufacturing firms change their business model in order to respond to challenges caused by service transition? (2) How does path dependence affect the business model change process of manufacturing firms in this context?*

In doing so, we follow a call by Demil et al. (2015) who explicitly point to the need for further research focusing on business model change processes in established firms. Moreover, our research also aims at answering the question *"… how path dependency constrains future changes in a business model"* raised by DaSilva and Trkman (2014: 387). The importance of this question is also emphasized by George and Bock (2011: 85) who state that *"… questions of business model path dependence remain unresolved"*. We answer these questions and provide empirically grounded insights how path dependence influences business model change processes of manufacturing firms in the context of service transition.

The remainder of this paper is organized as follows. We base our research on a commensurable theoretical framework that is enrooted in the well-established business model conceptualization by Amit and Zott (2001) and enhanced by insights drawn from the path dependence approach (Sydow, Schreyögg, and Koch, 2009; Vergne and Durand, 2011). The elements of this framework are explained in section 2. In section 3, we present research propositions that are thoroughly developed out of our theoretical background. The propositions depict an extension of our basic research questions and therefore allow us to analyze path dependent business model change processes triggered by service transition in a more detailed way. Section 4 is dedicated to the explanation of our research methodology. Our research is based on a multiple-case study approach; the design of our study follows suggestions by Yin (2009). The findings of this multiple-case study are highlighted in section 5 and discussed against the background of existing literature in section 6. The main insights of our study and their implications for research and business practice as well as limitations of our research are presented in section 7.

4.4.2 Theoretical Background

4.4.2.1 Business Model Concept and Business Model Change

Business model research was triggered by the rise of e-businesses during the internet boom in the late 1990s. Since then, the importance of this research stream considerably increased and is still growing (DaSilva and Trkman, 2014; Morris et al., 2005; Osterwalder et al., 2005; Zott et al., 2011). Despite the increasing number of publications, there is by now neither a clear definition of a business model itself (DaSilva and Trkman, 2014; Zott et al., 2011), nor of business model change (Bucherer et al., 2012; Spieth et al., 2014) available. In general, business models can be understood as a blueprint or a framework that helps to explain how value is created, delivered, and captured by the focal firm and its network partners (e.g. Casadesus-Masanell and Ricart, 2010; Demil and Lecocq, 2010; Morris et al., 2005; Teece, 2010; Zott and Amit, 2010; 2013). However, researchers emphasize different roles of business models (see Spieth et al. (2014) for an overview). Therefore, it is important to explain our understanding of the business model concept in detail.

In this paper, we follow Zott and Amit (2010, see also Amit and Zott, 2001; Zott and Amit, 2013; Zott et al., 2011) who regard the business model concept as a new unit of analysis that is conceptualized *"… as a system of interdependent activities that transcends the focal firm and spans its boundaries"* (Zott and Amit, 2010: 216). Hence, the business model concept does not only focus on firm-centric activities, but also considers how the focal firm is embedded in its business ecosystem (Zott and Amit, 2010; 2013). According to Amit and Zott (2001; 2012; see also Zott and Amit, 2010), a business model consists of the three design elements content, structure, and governance. Content refers to the activities that are performed within the activity system. This involves the exchange of products, services, and information between the various network partners as well as the capabilities required to facilitate this exchange. Next, structure depicts the linkages and the sequencing of the system's activities. Furthermore, aspects such as network size or the flexibility and adaptability of the system are explained. Last, governance describes by whom the activities are performed as well as the locus and nature of control of transactions within the activity system. When configurating these three design elements, firms can make use of four different so-called design themes that depict the value drivers of a firm's business model. First, a novelty-centered design involves an innovative (new to the market) conceptualization of the business model elements content, structure, and governance. Next, a lock-in-centered design

comprises a business model conceptualization that aims at achieving a high degree of customer and other network partners' retention. Third, by designing complementarities-centered business models firms can make use of value-enhancing effects of interdependent activities. Last, the value driver of efficiency-centered designs refers to the reduction of transaction costs.

The initial paper on business models by Amit and Zott (2001) is deeply embedded in an e-business setting. However, the resulting business model conceptualization can be easily transferred to the context of manufacturing firms as its theoretical foundation is built upon well-established theories and approaches that predate the e-business era such as transaction cost economics (e.g. Williamson, 1975), network theory (e.g. Katz and Shapiro, 1985), resource-based view (Barney, 1991; Wernerfelt, 1984) or Schumpeterian innovation (Schumpeter, 1934). This cross-theoretical perspective also distinguishes Amit and Zott's (2001) business model conceptualization from other business model conceptualizations (Morris et al., 2005). As the business model concept stems from managerial practice, researchers often fail to explicitly explain the theoretical underpinnings of the concept (George and Bock, 2011; Schneider and Spieth, 2013). Therefore, we are sure that employing Amit and Zott's (2001) theoretically well-defined business model conceptualization is appropriate in the context of our research.

Nevertheless, business models are not static. They need to be adjusted over time to be viable especially in the context of changing environmental conditions (Amit and Zott, 2012; Bucherer et al., 2012; McGrath, 2010). Hence, a transformational approach is required that regards the business model as a tool to handle organizational change (Demil and Lecocq, 2010). However, researchers refer to different terms which are used inconsistently and interchangeably in this context. When describing changes of a firm's business model, they for instance refer to business model innovation (e.g. Amit and Zott, 2012; Chesbrough, 2007a; Cortimiglia et al., 2016), business model evolution (e.g. Bohnsack et al., 2014; Demil and Lecocq, 2010; Doz and Kosonen, 2010), or business model experimentation (McGrath, 2010; Sosna et al., 2010), just to name a few. While business model innovation is mainly seen as the introduction of a fundamentally different, game-changing business model to an existing industry (e.g. Comes and Berniker, 2008; Markides, 2006; Snihur and Zott, 2013), some researchers emphasize that a continuous process of change that leads to business models that are new to the firm also requires further analysis (e.g. Bucherer et al., 2012; Schneider and

Spieth, 2013). In this paper, we clearly distinguish between *business model innovation* that leads to a radically different business model that is new to the market and *business model transformation* that involves changes in a firm's business model in general. In this context, researchers (e.g. Bucherer et al., 2012; Chesbrough, 2010) emphasize that product innovation or process innovation may lead to business model transformation if adjustments in the business model are necessary to benefit from these innovation types. However, Cavalcante et al. (2011) argue that not all organizational changes necessarily entail changes in the business model as otherwise the business model concept as a unit of analysis would be obsolete. Hence, we define business model transformation as any changes or refinements that fundamentally affect at least one design element of a firm's extant business model and thus the development of a business model design that is new to the firm. Furthermore, in contrast to Bucherer et al. (2012) who only consider deliberate changes in their definition, we follow Demil and Lecocq (2010) who argue that changes in the business model can be both, intended and emerging.

4.4.2.2 Path Dependence

The path dependence concept originates from evolutionary economics (Nelson and Winter, 1982) and has widely been discussed in the context of technology development and economic history (e.g. Arthur, 1989; 1994; David, 1985; Dosi, 1982). Later, researchers in the realm of institutional economics (e.g. North, 1990) adopted the concept. Only recently it increasingly gains interest from an organizational or managerial point of view (e.g. Sydow et al., 2009; van Driel and Dolfsma, 2009; Vergne and Durand, 2011). Defining path dependence rather broadly, research often comprises different types of organizational or strategic rigidities (Koch, 2008) or various *"'history matters' kinds of theoretical constructs"* (Vergne and Durand, 2010: 737). In contrast, a more narrow definition of path dependence is necessary in order to analyze path dependent processes in detail (Vergne and Durand, 2010). The framework of organizational path dependence developed by Sydow et al. (2009; see also Schreyögg and Sydow, 2011) employs such a precise understanding. Furthermore, it is basically in line with Vergne and Durand's (2010; 2011) perspective on path dependence. To avoid a fuzzy use of the term „path dependence" in the context of researching business model change, we explicitly make use of the path dependence concept and transfer this concept from an originally organizational level to a business model level. In their framework, Sydow et al. (2009; see also Schreyögg and Sydow, 2011) describe three phases of path dependent

processes. Similarly, Vergne and Durand (2010) define a particular process as path dependent if specific conditions are met. First of all, Sydow et al. (2009) refer to the so-called *preformation phase* in which the manager's scope of action is still rather broad, but the effect of particular strategic choices cannot be determined in advance. Vergne and Durand (2010; 2011) also argue that organizational path dependence is triggered by contingent and unpredictable events. The contingent effects of managerial choices then trigger self-reinforcing mechanisms that narrow possible trajectories of future decisions (Sydow et al., 2009; Vergne and Durand, 2011). The "critical juncture" at which the firm enters the dynamics of these self-reinforcing mechanisms also sets off the second phase – the *formation phase* of path dependence (Sydow et al., 2009). Due to dominant action patters that rise in this phase, alternative choices become less attractive. As a consequence, a particular path emerges in which managerial discretion increasingly narrows (Schreyögg and Sydow, 2011; Sydow et al., 2009). Self-reinforcing effects further restrict managerial discretion until they finally lead to the third and last phase of path dependence. In this so-called *lock-in phase* the organization is trapped in a situation in which the managerial scope of action is so limited that endogenous change becomes difficult. Preferred action patterns that are deeply embedded in organizational practice emerge. Usually, exogenous factors are necessary to allow the organization to leave this narrow corridor of strategic choices (Vergne and Durand, 2010). Although being trapped in a particular path is not necessarily harmful per se (Vergne and Durand, 2011), the inflexibility normally leads to inefficient or inferior solutions as the organization is not able to react to changing conditions and to adopt more efficient options that may emerge over time (Sydow et al., 2009).

4.4.3 Proposition Development

Traditional manufacturing firms employ a business model that is strongly product-focused and embedded in the firm's product-based dominant logic (Vargo and Lusch, 2004). This *"manufacturing orientation"* (Bowen, Siehl, and Schneider, 1989: 75) that stems from the *"mainstream management thinking from the industrial era"* (Grönroos, 1990: 8) is characterized by capital intensive production of tangible outputs in closed systems that allow for a high degree of standardization and an exploitation of economies of scale. Challenged by changing ecosystem conditions that lead to a higher demand for service, manufacturing firms are in a need to rethink and reorganize value creation processes (Lerch, 2014; Ramirez, 1999) and thus to adjust their business models. However, not all firms recognize the need for

business model change at the same time. An efficiency-centered business model design (Amit and Zott, 2001) is usually the predominant solution for manufacturing firms that do not actively engage in enhancing service offerings to respond to changing ecosystem conditions. Therefore, to detail research question (1) we propose:

Proposition 1: Manufacturing firms that do not pursue service transition primarily focus on an efficiency-centered business model design.

Persistence in a specific business model design choice is not necessarily the result of a deliberate decision. According to path dependence literature (Sydow et al., 2009; Vergne and Durand, 2011), persistence is very often the result of self-reinforcing effects. A traditional product-based business logic seems to be the first and most serious barrier that hinders manufacturing firms to change their business model to allow for a more service-oriented way of doing business (Kindström et al., 2013; Matthyssens and Vandenbempt, 2008). Furthermore, enhancing service offerings very often leads to a cost increase that is not accompanied by a respective increase of returns (Gebauer et al., 2005). Hence, although managers of manufacturing firms might recognize the growing importance of service offerings, a time lag with respect to profitability may lead managers to stick to the extant efficiency-centered business model design. Additionally, Schreyögg and Kliesch-Eberl (2007) highlight the important role core competences play as a trigger of path dependence. This has to be regarded related to manufacturing firms that are confronted with service transition challenges as their core competences are usually product-based and can therefore not or not easily be transferred to a service setting. Against this background and specifying research question (2), we state:

Proposition 2: Self-reinforcing effects prevent manufacturing firms from changing their business model and force them to persist in an efficiency-centered business model design.

A precondition for business model change is that manufacturing firms are able to break out of their dominant, product-based business logic in order to consider new ways of value creation (Matthyssens, Vandenbempt, and Bergham, 2006). Breaking path dependence requires according to Sydow et al. (2009) factors that are to a certain degree exogenous in nature. Examples of these factors are shocks or crises that severely threaten the firm, organizational demographic changes, or unintended consequences of organizational decisions triggered by

changes in the business ecosystem. In the context of manufacturing firms, a commoditization of products (Kowalkowski et al., 2012) and the fact that customers actively seek for service-enhanced solutions (Jaakkola and Hakanen, 2013) can be regarded as external triggers to break free from a path dependent business model design. However, by now path-breaking mechanisms in the context of business model change are widely underresearched. Therefore, path-breaking mechanisms need to be examined when trying to understand the role of path dependence in business model change processes. Hence, to illustrate research question (2) in more detail, we propose:

Proposition 3: Path-breaking mechanisms enable manufacturing firms to overcome obstacles to business model change.

When integrating service offerings into the traditionally product-based portfolio of offerings, manufacturing firms are challenged by rising transaction costs (Bowen and Jones, 1986) that force them to abandon their traditional efficiency-centered thinking (Grönroos and Ojasalo, 2004). As a consequence, an efficiency-centered business model design is no longer suitable for manufacturing firms. Instead, we assume that manufacturing firms need to find new ways to configurate the content element, structure element, and governance element of their business model and thus to thrive for implementing a novelty-centered business model design. Changing all three business model elements is necessary in the context of service transition (Clauß et al., 2014). Implementing service offerings does not only affect the content element of a business model. It also calls for the development of new organizational processes and structures (Kindström et al., 2013; Neely, 2008) as very often new network partners need to be integrated and deep customer-specific knowledge needs to be acquired (Hakanen, Kansola, and Valkokari, 2014) in order to allow for facilitating the provision of service (Storbacka et al., 2013). This also affects the governance element of the business model as integrating network partners goes along with a need to develop new ways to monitor and control network relations (Matthyssens and Vandenbempt, 2008).

However, radical business model innovation seems to be unfeasible for many manufacturing firms as studies (Gebauer and Fleisch, 2007; Kowalkowski et al., 2012) show that the pursuit of service-related opportunities very often happens stepwise. Resources (Fang et al., 2008) as well as managerial attention (Gebauer, 2009) are limited which may decelerate business model change. In this context, two different alternative business model change processes are possible. Firms can either pursue a complementarities-centered business model design or a

lock-in-centered business model design in a first step on their way to finally implementing a novelty-centered business design. This choice determines the order in which the business model elements content, structure, and governance need to be changed. When striving for a complementarities-centered business model design, firms start to offer services that are strongly tied to core products by leveraging existing resources and capabilities (Ulaga and Reinartz, 2011). Over time, they are able to develop new service-related capabilities on their own and to provide advanced services that are linked to their products (Salonen, 2011) or services that support the customer's value creation activities (Copani, 2014; Mathieu, 2001). Hence, in order to benefit from a complementarities-centered business model design, the type of offerings as well as resources and capabilities – and thus the content element (Amit and Zott, 2001) – are mainly affected. To specify research question (1), we therefore propose:

Proposition 4a: Manufacturing firms that employ a stepwise approach to service transition by initially implementing a complementarities-centered business model design predominantly change the content element of their business model.

However, firms may decide not to change the content element of their business model in a first step, but to put more emphasis on a stronger customer-centered perspective on value creation (Priem, 2007). These firms pursue service transition by implementing a lock-in-centered business model design in a first step. In doing so, they have to change the structure element as outside-in processes such as market sensing or channel bonding (Day, 1994) need to complement the traditional closed-system perspective of manufacturing firms (Grönroos and Ojasalo, 2004). Furthermore, these firms are also in a need to change governance mechanisms as collaborative, relational exchange replaces rather anonymous, automated transactions (Day, 2000). Again specifying research question (1), we propose:

Proposition 4b: Manufacturing firms that employ a stepwise approach to service transition by initially implementing a lock-in-centered business model design predominantly change the structure element and the governance element of their business model.

As any kind of change process, innovating or transforming the business model is a complex and highly challenging task (Mezger, 2014; Smith, Binns, and Tushman, 2010). Due to its complexity, business model change necessitates several interdependent decisions. To reduce

complexity, managers very often make use of prior experience and decide in favor of solutions they are familiar with (Gavetti and Levinthal, 2000; Maitland and Sammartino, 2015). The basic mechanisms that determine these decision making processes are invisible and may represent patterns that trigger path dependence. This is in line with Sydow et al. (2009) and explains why some researchers focusing on business model innovation (e.g. Bohnsack et al., 2014; McGrath, 2010) point to the possibility that the process of changing a business model may be path dependent. Especially the stepwise approach toward implementing a novelty-centered business model design is susceptible to the influence of path dependence as decisions that lead to implementing a complementarities-centered or a lock-in-centered business model design in the first step may not be in line with decisions necessary to implement a novelty-centered business model design. Garud, Kumaraswamy, and Karnoe (2010) highlight that such purposeful decisions may narrow managerial choices and thus represent triggering events that can initiate the emergence of path dependence. Although Vergne and Durand (2010) as well as Arthur (1989) argue that triggering events are usually contingent and non-purposive in nature, this does not contradict our reasoning as pursuing business model change can be the result of a series of deliberate and emergent decisions (Demil and Lecocq, 2010). Triggering events narrow managerial discretion (Sydow et al., 2009). However, they do not cause firms to persist in a complementarities-centered or in a lock-in-centered business model design. Following research question (2), we argue:

Proposition 5a: Triggering events decelerate the implementation of a novelty-centered business model design by manufacturing firms.

Apart from triggering events, path dependent persistence in a business model design requires the existence of self-reinforcing effects (Sydow et al., 2009; Vergne and Durand, 2011). Thus, to detail research question (2), we propose:

Proposition 5b: Self-reinforcing effects cause manufacturing firms to persist either in a complementarities-centered business model design or a lock-in-centered business model design.

We also need to take into account that manufacturing firms could be willing and able to change all three business model elements at once by developing a value creation logic that breaks the *"existing rules of the game"* (Matthyssens and Vandenbembt, 2008: 326). In this

case, the business model change process cannot be affected by path dependence. To cover this possibility and to specify research question (1), we propose:

Proposition 6: Manufacturing firms that pursue service transition by directly implementing a novelty-centered business model design change the content element, structure element, and governance element of their business model.

4.4.4 Methodology

4.4.4.1 Benefits of Case Study Research

Rigorous empirical research on business models that goes beyond single-case studies is still rare (Demil et al., 2015). Business model change processes are usually fuzzy (Dmitriev, Simmons, Truong, Palmer, and Schneckenberg, 2014). Hence, a research approach is necessary that allows for contextualization (Welch et al., 2011). Against this background, we decided for a multiple-case study approach as such an approach is especially suitable in a complex and novel research context (Orum et al., 1991; Wright, Lane, and Beamish, 1988) such as business model change. Moreover, a qualitative research approach does not only seem to be appropriate in the context of research on business model change processes, but also when considering path dependence. Although by now there is still no consensus with respect to methodological issues when it comes to analyzing and testing path dependence (Dobusch and Kapeller, 2013), Sydow et al. (2009) point out that studying path dependence requires a research design that allows for a detailed analysis of underlying social mechanisms that lead to path dependence. Therefore, case study research is especially appropriate as it allows gathering rich data (Yin, 2009) and helps to provide an in-depth understanding of processes within an organization (Bluhm et al., 2010). Furthermore, case studies are often used to gain insights on specific managerial problems (Eisenhardt and Graebner, 2007).

In contrast, Vergne and Durand (2010) argue that case studies are not appropriate to analyze path dependence and instead recommend controlled research designs such as simulations or experiments. However, controlled research designs are based on predetermined scenarios that neither go along with Dmitriev et al.'s (2014) reasoning in the context of business model research, nor with Sydow et al.'s (2009) suggestions related to path dependence research. As Garud et al. (2010) already emphasize, the "imagined worlds" of controlled research designs

cannot depict the contingencies that influence processes in real world situations. Hence, with controlled research settings we are not able to examine the challenges manufacturing firms experience when pursuing service transition-triggered business model change and the possible role path dependence plays in this context. Moreover, prior research in the realm of business model change as well as path dependence often uses case studies (e.g. Bohnsack et al., 2014; Khanagha et al., 2014; Koch, 2008; 2011; van Driel and Dolfsma, 2009) and shows that a case study can be utilized to gain valuable insights into this research context.

We decided to follow a case study approach that is explanatory in nature as we aim at building upon the theoretical framework developed by Sydow et al. (2009) to analyze path dependence in the context of business model change. Following a grounded theory approach (e.g. Glaser, 1992; Glaser and Strauss, 1967) and thus dismissing prior research – as it is usually done in the context of grounded theory (Langley, 1999) – is not appropriate. We regard case studies as natural experiments that help to explain and modify existing theory (Yin, 2009). In this context, it is important to understand that our objective is not to test the propositions we developed out of theory – they are not formulated in a way that allows falsifying them. Instead, the propositions are an extension of our basic research questions and thus help us to guide our case analysis in the right direction and to extend and enhance existing theory (Yin, 2009).

4.4.4.2 Research Setting and Data Collection

For our empirical analysis we had to identify case firms that are (a) affected by service-related ecosystem changes and (b) have the opportunity to respond to these changes by adjusting their business models. Hence, we chose firms operating in mechanical engineering or very similar industries as firms belonging to these mature industries are said to benefit in particular from service-related business model change (Kowalkowski et al., 2012; Oliva and Kallenberg, 2003). Following theoretical sampling (Eisenhardt, 1989; Eisenhardt and Graebner, 2007; see also Yin, 2009) we selected case firms based on information we gathered from firm websites. In detail, case firms were chosen based on the following criteria: (1) the case firm's core business needed to be product-based at least before service transition had eventually occurred; (2) the case firm needed to be characterized by one business model as case firms with parallel, competing business models (Markides and Charitou, 2004) are difficult to compare. Therefore, we decided to select case firms with no more than 500 employees; and (3) we needed to get access to information on the firm and to a competent key

informant (Kumar et al., 1993) willing to participate in an interview. Additionally, all our case firms are German capital-based firms that operate in a business-to-business setting. The focus on these specific selection criteria allows for controlling extraneous variation (Eisenhardt, 1989). A description of the case firms is presented in table 4.4–1.

Case firm	Industry (SIC code)	Founding year	Firm size (no. of employees)	Characteristics of offerings
1	351 engines and turbines	1996	251 – 500	Project-based sale of machinery; highly complex offerings; after sales service; increased importance of additional product-based services
2	356 general industrial machinery and equipment	1993	101 – 250	Project-based sale of machinery; low to medium degree of complexity of offerings; service offerings are determined by legal obligations (warranty); additional service offerings only on explicit customer request
3	355 special industry machinery except metal working	1962	101 – 250	Solution-based portfolio of offerings; inseparability of product and service offerings; offerings highly tailored to customer needs; highly complex offerings, long-term, large-scale projects as well as short-term, transaction-based offerings
4	354 metal working machinery and equipment	1992	26 – 50	Project-based sale of machinery; low technical complexity of products, but high complexity of offerings due to high degree of customization
5	353 construction, mining, and materials handling	1990	51 – 100	Sale of rather standardized machinery; after sales services; additional service offerings that are linked to the product business
6	349 miscellaneous fabricated metal products	1970	101 – 250	Project-based sale of hybrid offerings as well as transaction-based sale of standardized products; medium to high degree of complexity of offerings; increased importance of network partners that offer complementary products and services
7	356 general industrial machinery and equipment	1997	51 – 100	Project-based development and sale of highly customized, highly complex machinery as well as sale of highly standardized products
8	359 miscellaneous industrial and commercial	1991	26 – 50	Sale of standardized products as well as a wide range of add-on services; highly complex offerings
9	359 miscellaneous industrial and commercial	1970	101 – 250	Project-based sale of standardized products; medium degree of complexity of products service offerings are determined by legal obligations (warranty)
10	344 fabricated structural metal products	1994	26 – 50	Solution-based portfolio of offerings; inseparability of product and service offerings; highly complex offerings; mainly project-based business
11	369 miscellaneous electrical machinery, equipment, and supplies	1991	26 – 50	Project-based sale of standardized products; highly complex offerings due to high degree of customized installation of products

12	354 metal working machinery and equipment	2003	26 – 50	Sale of standardized products as well as long-term service contracts; low to medium degree of complexity of products, highly complex service offerings
13	355 special industry machinery except metal working	1998	26 – 50	Increased importance of project-based sale of highly customized machinery; service offerings are determined by legal obligations (warranty)

Table 4.4-1: Case firm description.
Source: Own illustration.

We base our analysis on two data sources. First, we conducted semi-structured interviews with CEOs. This approach, on the one hand, allows us to benefit from open answers that provide deeper insights into the "lived experience" of our interviewees (Gioia et al., 2013). On the other hand, it also enabled us to guide the interviews and thus link them to our developed propositions (Yin, 2009). Following suggestions by Yin (2009), we developed an interview guideline that considers our research propositions – and in this context especially the business model conceptualization by Amit and Zott (2001) and the research suggestions by Sydow et al. (2009). Related to the business model, we did not directly ask for the business model as a whole but for its design elements content (e.g. Which products and services do you currently offer?; Which resources and capabilities are necessary to provide your portfolio of offerings?), structure (e.g. How are customers and other network partners integrated into value creation processes?; Please specify the main network ties you consider essential for value creation processes?), and governance (e.g. Which control mechanisms do you employ to safeguard value creation processes?; How do you incentivize customers and other network partners to contribute to value creation?). Furthermore, we asked the interviewees whether the business model elements have been stable or experienced change over time. If the interviewees reported change, we asked them to explicitly describe the change process by naming and explaining critical incidents. When no change was reported, we further investigated the reasons for this persistence. This was necessary to be able to identify strategic persistence, self-reinforcing effects and triggering events – the three aspects Sydow et al. (2009) highlight as being crucial in the context of path dependence research.

The interviews were conducted by two researchers at the firm locations as suggested by Eisenhardt (1989) between April 2014 and July 2014 and lasted on average about 90 minutes each. We carefully transcribed the interviews and sent the transcripts back to our informants for a double-check to prevent misunderstandings. Data from firm reports, press releases, websites, or additional information provided by our informants represents our second data source. The additional information gathered was used for data triangulation (Yin, 2009). This

was necessary to enhance the validity of our study (Gibbert et al., 2008) as retrospective reports might be biased due to the CEOs' individual perception of the past (Golden, 1992; Huber and Power, 1985). An accurate description of historical events is especially in the context of path dependence research a necessary precondition (Sydow et al., 2009). To protect informants' interests we promised anonymity (Gioia et al., 2013). Therefore, we will present the collected case data without mentioning firms by name.

4.4.4.3 Data Analysis

To analyze our data, we first developed case histories of each case firm by synthesizing data from both data sources in order to generate a rich account (Eisenhardt, 1989; Graebner and Eisenhardt, 2007). These write-ups included reduced data, selected quotes as well as tables showing timelines and key facts. We then divided our case analysis in two parts. First, we examined each case individually. Our propositions helped us to organize this within-case analysis (Yin, 2009). We analyzed the current business model elements of each case firm as well as the events that led to the particular configuration of the case firm's business model. We used pattern matching (Trochim, 1989) and explanation building techniques (Yin, 2009) to compare empirical data with our theoretical assumptions. Only in a second step after all individual case histories were finished, we conducted a cross-case analysis. This second type of analysis enabled us to compare identified patterns across cases and allowed us to evaluate our propositions and gain additional insights. In doing so, we followed Eisenhardt (1989) who suggests comparing pairs of case firms for differences and similarities in an iterative process. Charts and tables helped us to systematically match and contrast data from different cases.

The authors conducted this data analysis process independently in order to ensure data reliability. The emerging results from the within-case analysis and later from the cross-case analysis were then compared. The patterns independently identified by the authors fully matched. As in no instance a conflict between the two authors' interpretations emerged, the identified patters can be regarded as reliable. Furthermore, we reexamined the original interview transcripts and archival data in order to ensure that our results are consistent with the original data sources. Additionally, we discussed emerging results of the within-case analysis with some of our informants to get additional feedback regarding the accuracy of our findings.

4.4.5 Findings

By making use of the propositions developed in section 3 as guiding principles for our research (Yin, 2009), we first of all analyzed the business model change of each case firm in detail. The results of this within-case analysis are provided in table 4.4–2.

Case Firm	Business Model Change Process	Description
1	From an efficiency-centered business model design to a complementarities-centered business model design	*Customer initiatives** forced the firm to enhance its service offerings resulting in major changes of the content element from solely product-centered offerings to a combination of products and accompanying service add-ons; structures and governance mechanisms are still heavily linked to a traditional product-centered business logic; firm builds on the benefits of rule-guided behavior which triggers a **coordination effect****; persistence in a complementarities-centered business model design
2	Persistence in an efficiency-centered business model design	Firm believes in its product-related strength and experiences service transition as a costly challenge; market experience condenses in a **learning effect**** that leads to a focus on exploiting existing product-related capabilities that build the groundwork for its competitive position; persistence in an efficiency-centered business model design
3	From an efficiency-centered business model design directly to a novelty-centered business model design	A *severe crisis** that threatened the firm's existence forced the firm to radically change the former efficiency-centered business model design by redesigning the whole portfolio of offerings with a special focus on service solutions, by reorganizing and enhancing the firm network, and by implementing new control mechanisms and incentives; these changes result by now in a dynamic, novelty-centered business model design
4	From an efficiency-centered business model design to a lock-in-centered business model design	*Business succession** resulted in strategic change characterized by a stronger focus on customer demands; following, the new strategy called for a change of the structure element and the governance element; strong network ties and informal governance mechanisms such as trust became more important; the strong network focus triggered interdependencies that result in a **complementary effect**** and cause a persistence in a lock-in-centered business model design
5	From an efficiency-centered business model design currently changing to a complementarities-centered business model design	*Customer initiatives** opened an opportunity to increase revenues by offering services; against this background the firm started to implement a first set of service offerings; firm is open for future service opportunities and is currently adjusting the content element of its business model
6	From an efficiency-centered business model design currently changing to a novelty centered business model design by temporarily implementing a lock-in-centered business model design	A *series of internal changes** resulting from a process innovation in the past enhanced the possibilities to integrate network partners and thus to better serve customer needs; following, this unintended development resulted in an change of the business model design; in a first step the firm considerably changed the structure element and the governance element of its business model and implemented a lock-in-centered business model design to match the new conditions; however, these changes initiated a dynamic process that is characterized by changes especially in the content element; therefore, the firm did not experience persistence in a lock-in-centered business model design, but is constantly moving in the direction of a novelty-centered business model design

7	From an efficiency-centered business model design to a lock-in-centered business model design	*Intensified competition** forced the firm to rethink its basic business logic and to focus on the integration of customers and other network partners in value creation processes; following, the firm had to change the structure element and the governance element of its business model; the strong network focus and the necessity to make use of synergies cause **complementary effects**** that, in spite of an awareness of disadvantages of the business model design choice, result in a persistence in a lock-in-centered business model design
8	From an efficiency-centered business model design to a lock-in-centered business model design and currently changing to a novelty-centered business model design	*Business succession** resulted in changes of the structure element and the governance element as the new CEO put more emphasis on sustaining customer relations; following, a lock-in-centered business model design was implemented; as this design turned out to be successful, **complementary effects**** caused the change process to stop; later on, unintended consequences of a product innovation unfroze the change process as fundamental changes of service offerings and an adjustment of service-related capabilities were necessary; this led to the firm to change the lock-in-centered business model design toward a novelty-centered business model design
9	Persistence in an efficiency-centered business model design	Although the firm is aware of service transition benefits, benchmarks set by competitors and a lack of an internal culture to bring forward new ideas prevent the firm from pursuing service-related opportunities; these **adaptive expectation effects**** lead to a persistence in an efficiency-centered business model design
10	From an efficiency-centered business model design to a novelty-centered business model design by temporarily implementing a complementarities-centered business model design	A *crisis** forced the firm to step away from its efficiency-centered business model design; following, the firm integrated services into its product-centered portfolio of offerings as this seemed to be an opportunity to increase revenues; however, before the firm was able to benefit from a complementarities-centered business model design, it was hit by a *severe crisis**; to overcome the crisis the firm had to completely close down the own production; today, the firm acts as a network integrator that offers product-service solutions that mainly combine product offerings and service offerings of external network partners; thus the firm makes use of a novelty-centered business model design
11	From an efficiency-centered business model design currently changing to a novelty centered business model design by temporarily implementing a lock-in-centered business model design	Intensified competition and new technological developments caused a *crisis** as the products of the firm did no longer match market standards; searching for a niche market the firm intensified its customer relations and developed customized products changing the structure element and the governance element and thus making use of a lock-in-centered business model design; soon after this first step the firm realized the potential inherent in service offerings and considerably changed the content element of its business model as well; this stepwise approach to implement a novelty-centered business model design was driven by resource constraints that prevent a direct business model transformation from an efficiency-centered business model design to a novelty-centered business model design
12	From an efficiency-centered business model design to a lock-in-centered business model design	*Business succession** resulted in fundamental changes of the firm's business logic with respect to the role of the customer; following, a redesign of the network structure and the network governance became necessary as network partner retention became more important; the strong network focus triggered interdependencies that result in a **complementary effect**** and cause a persistence in a lock-in-centered business model design
13	From an efficiency-centered business model design to a currently not determined business model design	*Business succession** resulted in new firm objectives that are not in line with an efficiency-centered business model design; however, the new strategy is by now not manifest in the business model design which is still in a flux

* path-breaking mechanisms; ** self-reinforcing effects

Table 4.4-2: Business model change processes of the analyzed 13 case firms.
Source: Own illustration based on case data.

The follow-up cross-case analysis allowed us to identify overarching patterns in service transition-triggered business model change of manufacturing firms. We found four development paths that differ in the way how a firm's business model change process takes place. Figure 4.4–1 summarizes the findings of our cross-case analysis.

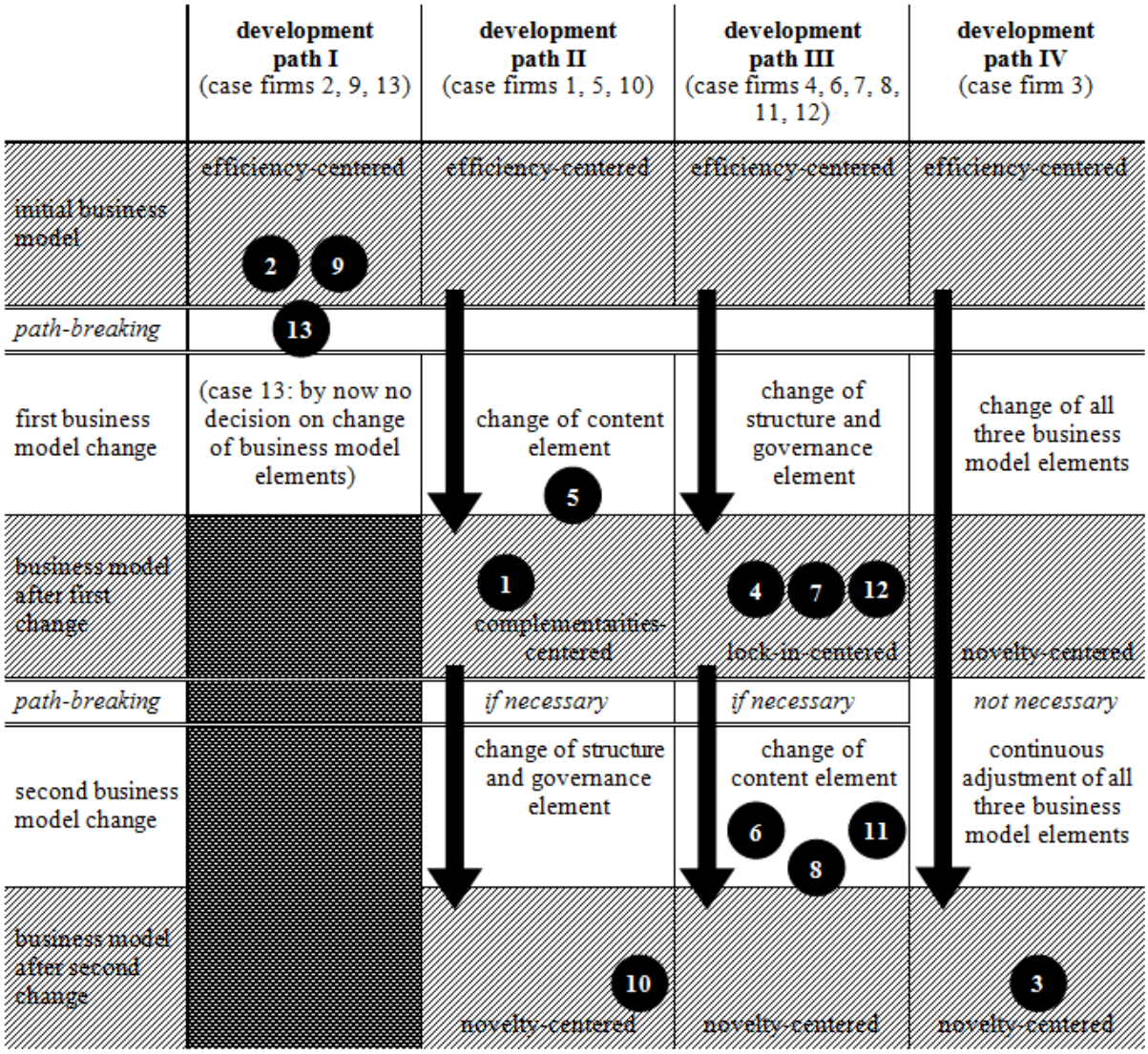

Figure 4.4-1: Business model development paths of the 13 case firms.
Source: Own illustration based on case data.

Our case data provides evidence that all case firms started off with an efficiency-centered business model design. Making use of such a design is mainly a consequence of a product-based business logic that manufacturing firms traditionally employ. The interviewed CEOs told us that their firms experience an enhanced demand for service. However, the CEOs pointed to the fact that reacting to service-related market changes is difficult as established structures, routines as well as a basic understanding of the firm's way of doing business

prevent firms from encompassing business model changes. The CEO of case firm 1, for instance, explained:

> *"Our expertise in developing high quality machinery dates back to the inception of the firm. We are famous for our products. Suddenly, we also need to offer service. Changing this perspective is difficult."*

This statement points to the relevance of rigidities that trap firms in their initial efficiency-centered business model design. While the development paths II, III, and IV are characterized by case firms that were able to change their initial business model design, a persistence in an efficiency-centered business model design can be observed for development path I (case firms 2, 9, and 13). According to the statements of the CEOs of these case firms, service transition is not regarded as an opportunity. The CEO of case firm 2, for example, told us:

> *"In the end, customer decisions are price-driven. Therefore, we primarily focus on a cost-efficient production."*

Hence, our case findings are in line with proposition 1. According to the CEOs of case firms 2 and 9, primarily focusing on efficiency is suitable for these firms in order to exploit existing capabilities in the best possible way.

However, we need to question whether focusing on an efficiency-centered business model design is a deliberate decision. The interview data provides evidence that this decision may also be an emergent one that is caused by path dependence. The CEO of case firm 9 emphasized:

> *"We know our competitors very well – and they know us. Basically, we are all bound to the same conditions and we all follow the same practices that are established in our area of business."*

This benchmarking perspective prevents case firm 9 from even considering business model change as an opportunity. In this case, the fear of losing legitimacy plays an important role that delimits the firm's scope of action. Long-established and well-accepted market rules seem to be of special relevance in this context. Firm offerings are to a great extent exchangeable so that competition is based on product prices. On the one hand, the risk of establishing an innovative business model that allows for differentiation is considered as

being too high by the CEO of case firm 9. On the other hand, transforming the business model in small steps does according to the CEO of case firm 9 not provide a sufficient competitive advantage in terms of differentiation. Therefore, reducing costs seems to be the only opportunity for case firm 9 to improve the market position. For case firm 2, we see that the scope of action is heavily affected by a strong focus on exploiting existing resources and capabilities. This firm benefits from its resource base and product-related capabilities. Acquiring new resources and capabilities does not stand at the forefront for case firm 2 as according to the CEO making the most out of existing resources and capabilities is considered as the most promising way to ensure market survival. In other words: exploiting an area the firm is already familiar with is seen as being superior to a risky exploration of new opportunities. Path dependence literature (Sydow et al., 2009) classifies these effects as self-reinforcing effects (adaptive expectation effects and learning effects) that trap firms in a specific development path. Therefore, our findings are in line with proposition 2. Related to development path I this means that these firms are not able to encompass business model change as these self-reinforcing effects act as a blinder to the recognition of business opportunities that are not in the scope of the extant business model. Also being part of development path I, case firm 13 is a special case. In contrast to case firms 2 and 9, case firm 13 is able to think outside the box. This is a result of business succession which allows the firm to discard the blinder of self-reinforcing effects and thus to consider new opportunities. However, this recognition is by now not reflected in a business model change as case firm 13 still struggles with overcoming the deeply enrooted structures and routines of an efficiency-centered business model design. Therefore, case firm 13 is still affected by path dependence and thus still belongs to development path I.

The results related to case firm 13 already point to the importance of path breaking mechanisms in overcoming path dependent business model designs. In line with proposition 3, we found that business model change is in all case firms triggered by a path-breaking mechanism. However, our case data reveals that different path-breaking mechanisms account for the initiation of business model change. In detail, we identified three main path-breaking mechanisms that are of relevance in the context of service transition-triggered business model change: (1) customer initiatives, (2) business succession, and (3) crisis. Customer initiatives have to be regarded as path-breaking mechanism for our case firms 1 and 5. We understand customer initiatives as a process that is characterized by customers actively approaching a firm and presenting new ideas and demands. Thereby, customers cause the firm to rethink its

value proposition. Hence, customer initiatives can serve as a path-breaking mechanism as they represent a new interface with the business ecosystem. The CEO of case firm 5 emphasized:

> *"Of course, our products represent the main source of revenues. Without products, we cannot offer services. However, recently we realized that customers increasingly demand services and now we also proactively sell services to our customers. With respect to products, we need to wait for the customers to approach us. Regarding services, we are able to generate recurring revenues."*

Hence, customer requests enabled case firms 1 and 5 to recognize new customer needs. Following, the firms were able to transform their business models accordingly and thus to actively pursue service-related opportunities.

Business succession is the second path-breaking mechanism we identified (case firms 4, 8, 12, and 13). When a new CEO with a different background and different experiences takes over, a process of rethinking established practices can be observed. Our case data shows that a new CEO does not hesitate to question the extant, well-established business model even if it is still profitable. The CEO of case firm 4 explained:

> *"My predecessor was mainly concerned about continuously increasing product quality and optimizing production processes. Customer relations and network-related aspects have never been an issue for him. When I took over the responsibility for the firm I instantly tackled these problems and initiated changes."*

Business succession provides an opportunity to bring an external perspective into a firm. As a consequence, firms are able to proactively implement business model changes before external pressure calls for these changes.

The third main path-breaking mechanism is according to our case data a crisis that threatens firm survival. Such a crisis forces a firm to actively search for new opportunities to overcome the threat of failure. In this situation, the extant business model is proven wrong so that the idea of abandoning the extant business model does not cause much resistance. To ensure firm survival, questioning the whole way of doing business is no longer off-limits. We observed such a reaction to a crisis in case firms 3, 10, and 11. The CEO of case firm 3 explained:

"We knew that if we did not change we would not have survived. Therefore, everything that was taken for granted in the past needed to be questioned."

Case firm 7 experienced intensified competition. Although this competitive pressure was not critical in terms of firm survival, it has to be regarded as a threat. While both, intensified competition as well as a crisis are a threat that forces firms to react and to change the business model, the identified path-breaking mechanisms customer initiatives and business succession provide the opportunity for business model change.

In general, path-breaking mechanisms result from external developments. This insight holds true for all case firms except for case firm 6. Related to this special case, we were not able to identify an external influence that caused path-breaking. Instead, business model transformation was the unintended consequence of a series of unrelated firm-internal decisions. As business model transformation seems to be a random development in this case, we do not consider this internal progress as a specific category of path-breaking mechanisms in the context of business model change.

Our case data shows that the type of path-breaking mechanism determines how the change of a manufacturing firm's initial efficiency-centered business model takes place. Firms that experience customer initiatives as path-breaking mechanism follow development path II (see figure 4.4–1). In this context, case firms (1 and 5) transform their business models in a first step by changing the content element as customers call for enhanced service offerings. Interestingly, while the case firms mainly offer services that support the firms' products, services that support customers' actions are not in the main focus of the two case firms. The CEO of case firm 1 explained:

"We only offer services that are directly linked to our core products. Recently, customers increasingly demand services. This is a new source of revenues for us. However, as we are a manufacturing firm, the product business is our main focus."

Hence, these case firms tie their service business strongly to their product business in order to benefit from economies of scope. Structures and processes that support the product business are also used for the service business. Moreover, products and services are sold to the same group of customers. Therefore, these firms benefit from complementarities and make use of a

complementarities-centered business model design. With respect to the business model development path, this insight is in line with our proposition 4a.

When business succession is the path-breaking mechanism that initiates business model change, our case data shows that case firms (4, 8, 12) transform primarily the structure element and the content element and move toward a lock-in-centered business model design in a first step (development path III, see figure 4.4–1). The CEO of case firm 4 told us:

> *"For us it is important to cooperate with our customers and our business partners in order to find new solutions for specific customer problems. On a technological level there is nothing our competitors cannot also do. However, it is the close interaction with our network partners that defines our exceptional position in the market."*

Besides this structural change, case firms 4, 8, and 12 also strongly benefit from new, rather informal governance mechanisms. The informal governance of transactions stands in a strong contrast to the formal, contract-based governance mechanisms used in the realm of their former efficiency-centered business models. This business model transformation allows firms to enhance customer and network partner retention by building trustful, long-term relationships. This finding is consistent with proposition 4b. Our findings related to case firm 13 do not contradict the insight that business succession leads to development path III as this case firm did despite experiencing business succession by now not successfully break the initial efficiency-centered business model design path. For the future, it would be interesting to know if case firm 13 will be able to finally break the initial path dependence and following to enter development path III.

Our case data shows that the incident of a crisis itself does not determine the business model development path. Instead, the characteristic of the crisis has to be considered. Case firm 3 that was threatened by a severe crisis caused by disruptive changes in the firm's business ecosystem changed all three business model elements in one step and thus directly implemented a novelty-centered business model design. This direct move toward an innovative business model is in line with proposition 6. In contrast, case firms 10 and 11 experienced crises that were not fostered by disruptive changes in the business ecosystem, but by rather firm-centric factors such as a lack of strategic foresight or disagreements in the top management team. Case firm 7 only experienced intensified competitive pressure that might have caused a firm-level crisis if no changes had been made. Therefore, these three case firms

did not question all three business model elements at once like case firm 3 did, but decided for a stepwise adjustment of specific business model elements. However, case firms 10 and 11 had to recognize that these incremental changes were not enough to overcome the crisis. The CEO of case firm 10 highlighted:

> *"It was not enough to develop expertise in the realm of services. Last year, I needed to reorganize the whole firm, to outsource production processes, and to develop a network of partners that allow us to offer more integrated product-service solutions. Otherwise, the firm would not have survived."*

We see that a crisis in general is a strong driver of business model transformation that pushes firms toward the implementation of a novelty-centered business model design.

Our case data shows that not all firms that were able to overcome the efficiency-centered business model design by now make use of a novelty-centered business model design. Related to business model development paths II and III (see figure 4.4–1), we can observe that some case firms experienced persistence in either a complementarities-centered business model design (case firm 1) or a lock-in-centered business model design (case firms 4, 7, 8, 12). The CEOs of these case firms explained that the first step of changing the business model had been challenging and costly to their firms. Therefore, the CEOs of case firms 1, 4, 8, and 12 highlighted that after a period of changes they wanted to capitalize on the newly established business model design. As they were able to considerably enhance their revenues, they did not see a necessity to further transform their business models at that point in time. The CEO of case firm 1 stated:

> *"We are quite satisfied with the development of our business at the moment. By now, we just do not see how we could do things better."*

In these cases the firms showed a strong tendency to strive for exploitation after a period of exploring new business model-related opportunities that followed a path-breaking event. This change of tactics can be regarded as a triggering event that causes firms to enter a new path – a finding that is in line with our proposition 5a. However, case firms 6, 10, and 11 are not affected by triggering events that narrow the scope of action. Instead, they move on in their development toward a novelty-centered business model design. For these firms we did not find evidence that they experience path dependence after being able to break free from the initial path dependent efficiency-centered business model. Our case data indicates that the CEOs of case firms 6, 10, and 11 regard business model change as a continuous process,

while the CEOs of case firms 1, 4, 8, and 12 highlighted a discontinuous nature of change. This provides evidence for a specific influence of managerial perception on business model change.

In contrast to the explanations provided by the CEOs of case firms 1, 4, 8, and 12 that they are quite satisfied with their employed business model, we see a strong indication that their prolonged persistence in a business model design can also be the result of path dependence. The CEOs of all firms that are currently making use of a lock-in-centered business model design (case firms 4, 7, and 12) or experienced a persistence in a lock-in-centered business model design in the past (case firm 8) explained that their business model strongly benefits from linkages to the network of partner firms and customers. The CEOs further emphasized that they are in a position to manage the network. In doing so, they are able to bundle and make use of their network partners' resources and capabilities. Therefore, changing established routines and structures that determine network collaboration does not seem to be an advantage as deviating from these practices would endanger the network-based supply with resources and capabilities. These aspects indicate the existence of certain externally-triggered complementary effects in the context of case firms that follow development path III (see figure 4.4–1). Moreover, the CEO of case firm 1 (development path II) strongly emphasized the need to adhere to specific rules and compliance guidelines in the context of transactions. He explained that all processes, no matter whether they are product-related or service-related, have to follow the same basic principles. This idea of unification is a remainder of the traditional product-based business logic. An emphasis on internal consistency and fixed practices points to coordination effects that seem to hinder business model transformation with respect to the structure element and the governance element. The identified complementary effect (development path III) as well as the coordination effect (development path II) are self-reinforcing effects that trap firms in either a lock-in-centered business model design or a complementarities-centered business model design. A statement of the CEO of case firm 7 illustrates this unintended persistence:

> *"Most of the time our service offerings are only a means to increase customer retention. We try to generate revenues out of our service business, but unfortunately by now only 10% of our revenues are service sales."*

Later on in the interview he further explained:

"We already improved our structures and adjusted processes among business partners. We do not see a potential for further changes that might push our service business.

The identified self-reinforcing effects are in line with proposition 5b.

4.4.6 Discussion

Changing the business model seems to be a requirement for manufacturing firms to be able to pursue service-related opportunities (Kastalli et al., 2013; Kindström, 2010). Casadesus-Masanell and Ricart (2010) state that a business model reflects a firm's strategy and comprises a set of managerial choices as well as the consequences of these choices. Therefore, business model change requires rethinking managerial choices made in the past. Our case data shows that manufacturing firms struggle to change their business model in the context of pursuing service transition as these firms experience difficulties in redesigning their traditionally efficiency-centered business model. In this context, literature points to the relevance of cognitive constraints (e.g. Gebauer et al., 2005; Gebauer and Friedli, 2005) as well as the lack of service-related capabilities (e.g. Gotsch, Hipp, Erceg, and Weidner, 2014; Ulaga and Reinartz, 2011) that hinder firms to benefit from service-related opportunities. In addition, we show that the initial efficiency-centered business model of manufacturing firms is path dependent. Therefore, manufacturing firms need to be able to break the path of the efficiency-centered business model design in order to pursue service transition. With respect to path breaking, we found three main mechanisms – customer initiatives, business succession, and crisis – that are external in nature and enable manufacturing firms to abandon the initial efficiency-centered business model design. The path-breaking mechanisms we uncovered in the context of business model change support the reasoning by Sydow et al. (2009) who point to similar path-breaking mechanisms in the context of organizational path dependence. This is not surprising as organizational path dependence and business model path dependence are to a certain extent linked.

Although business model literature (Bohnsack et al., 2014; DaSilva and Trkman, 2014; George and Bock, 2011) already points to the relevance of path dependence, it is by now unclear how path dependence evolves in the context of business models and how it affects business model change. According to our case data, we see that manufacturing firms experience business model change after breaking free from an efficiency-centered business

model design in two different ways. One group of firms is no longer affected by path dependence on their way to implementing a novelty-centered business model design. However, a second group of firms is still confronted with path dependence that influences decisions related to business model transformation. This difference can be explained by the fact that breaking the path of a particular business model design does not necessarily completely open up the scope of action, but very often only broadens it (McGrath, 2010). We see that path breaking means for some firms that they are able to completely dissolve the initial path dependence, while others are only able to break free from being trapped in a specific business model design, but are not able to completely dissolve path dependence. Our case findings provide a more detailed perspective on this phenomenon. Path-breaking mechanisms have to be taken into account as they differ in terms of the effect they create. Our multiple-case study shows that we need to distinguish between opportunity-driven path-breaking mechanisms (customer initiatives and business succession) and threat-driven path-breaking mechanisms (different manifestations of crises). The latter are more likely to cause path dissolution. This is in line with literature that shows that economic shocks can trigger change, provoke firms to take greater risks (Bromiley, 1991), and lead firms to pursue new opportunities that were previously unrecognized (Singh and Yip, 2000; Wan and Yiu, 2009). However, we need to consider that radical change increases the risk of failure (Chakrabarti, 2015; Singh and Yip, 2000). Hence, our sample might be affected by a survival bias.

As a consequence, we need to consider that firms can on the one hand directly change their business model to a novelty-centered business model design. On the other hand, they can also employ a stepwise approach to business model change with the aim of finally implementing a novelty-centered business model design. Making use of a direct approach is only possible for firms that were able to completely dissolve the path dependence of their initial efficiency-centered business model. A direct approach requires a simultaneous change of all three business model elements. Therefore, the business model change process of firms that follow this approach is not affected by further path dependence. However, radically changing all three business model elements seems to happen only in case of disruptive ecosystem changes. This finding is in line with Khanagha et al. (2014) who argue that established firms only encompass radical business model changes when groundbreaking developments in the business ecosystem force them to do so. However, we also enhance the findings of Khanagha et al. (2014) as we show that innovative business models can also be the result of many small transformation steps that are not triggered by severe ecosystem changes. Nevertheless,

regarding firms that follow a stepwise approach, our case data indicates that path dependence can prevent firms from finally being able to implement a novelty-centered business model design. But why does path dependence affect some firms, while other firms do not experience a restriction of managerial discretion caused by path dependence in their business model change process?

According to our study, firms that successfully completed the stepwise approach or are about to complete it are very much alike to the firms that directly implemented a novelty-centered business model design. These firms approach business model change by employing a market perspective. The decision how to change specific business model elements is strongly influenced by asking what the market needs. Cortimiglia et al. (2016) distinguish between an outside-in and an inside-out perspective on business model innovation. According to their findings, the outside-in perspective is mainly prevalent in entrepreneurial ventures, while the inside-out perspective is linked to established firms. Hence, our results extend the findings by Cortimiglia et al. (2016) as we show that an outside-in perspective is also relevant in the context of established firms. Furthermore, case firms that take an outside-in perspective are more proactive in pursuing service transition-triggered business model change. However, it is important to understand that this proactiveness is not linked to a higher entrepreneurial orientation (Lumpkin and Dess, 1996), but rather the result of experiencing threats or the consequence of unanticipated side effects. The latter effect can be observed in case firms that experienced the first step of business model transformation as an emergent process and only later on recognized the benefits of a novelty-centered business model design. A possible emergent nature of business model transformation in the context of service transition is supported by literature (Fischer et al., 2010; Kowalkowski et al., 2012) that points to the relevance of ad-hoc decisions, continuous modifications and incremental change that may for manufacturing firms cause unanticipated side effects.

In contrast, case firms that are affected by path dependence in their business model transformation process rather focus on an inside-out perspective. Starting point for business model change is for these firms always the already employed business model design. Changes are implemented based on existing resources and capabilities that are only adjusted and recombined. The strong focus on retaining existing resources and capabilities is not surprising as for instance Khanagha et al. (2014) already provide first evidence for such a behavior of established firms. In the context of our case firms, limited resources seem to affect business

model transformation decisions. Fang et al. (2008) point to the relevance of resource slack in the context of service transition. Furthermore, Ulaga and Reinartz (2011) highlight that manufacturing firms need to develop capabilities in order to leverage resources to be able to pursue service-related opportunities. Especially smaller firms seem to be affected by these challenges (Gebauer, Paiola, and Edvardsson, 2010; Kowalkowski et al., 2013). Therefore, it is comprehensible why firms in our sample decide to switch from exploration to exploitation after finalizing the first step of business model change. However, this decision is a triggering event that, if accompanied by self-reinforcing effects such as coordination effects and complementary effects, trap a firm in either a complementarities-centered business model design or a lock-in-centered business model design. The self-reinforcing effects we were able to identify in the context of business model path dependence are again also of relevance in the context of organizational path dependence as highlighted by Sydow et al. (2009).

As a last aspect, we need to discuss whether the novelty-centered business model design itself can be affected by path dependence. As only two firms in our sample already finalized the process of implementing a novelty-centered business model design, we have only first insights regarding this aspect. However, the novelty-centered business model designs of both case firms that completed the change process do not show rigidities. Instead, they are characterized by a high degree of flexibility that becomes apparent in dynamic and ongoing adjustments of all three business model elements. This specific flexibility as part of the business model design is something we also observe in the business models of the case firms that are currently changing toward a novelty-centered business model design. Therefore, a novelty-centered business model design seems to encompass certain "discrediting mechanisms" (Garud et al., 2010) that help to prevent negative effects of path dependence. A reason why this might be the case is that the novelty-centered business model designs of our case firms are characterized by a strong customer- and network-orientation. These business model designs allow the firms to sense changes in the business ecosystem more quickly – an insight that supports the theoretical reasoning by Lusch et al. (2007).

4.4.7 Conclusion, Limitations, and Outlook

In this paper, we conduct a multiple-case study analyzing business model change processes of 13 manufacturing firms that are challenged by service transition. Related to our first research question *(1) How do manufacturing firms change their business model in order to respond to*

challenges caused by service transition? we provide evidence that manufacturing firms strive for establishing a novelty-centered business model design when challenged by service transition. Starting from an efficiency-centered business model design, the business model change process can take place either directly or stepwise. The direct approach is characterized by a simultaneous change of the content element, the structure element, and the governance element of the business model. In contrast, firms that employ a stepwise approach do not question the whole business model design, but encompass focused changes of specific business model elements while coevally trying to keep the other business model elements stable. Thus, our findings contribute to process-related research on business model innovation and transformation (e.g. Cortimiglia et al., 2016; Frankenberger, Weiblen, Csik, and Gassmann, 2013) as we are able to uncover the steps of business model change processes in the context of established manufacturing firms in detail. Furthermore, we overcome a deficiency also highlighted by Schneider and Spieth (2013) that most studies on business model change only refer to radical, industry disruptive business model innovation.

We are able to answer our second research question *(2) How does path dependence affect the business model change process of manufacturing firms in this context?* by identifying four business model development paths that differ in the way how they are affected by path dependence. Our results show that all manufacturing firms under research initially employed a path dependent, efficiency-centered business model design. Business model development path I is characterized by firms that still make use of an efficiency-centered business model design. These firms are due to path dependence by now not able to encompass changes in their business model. In contrast, firms following business model development paths II, III, or IV were due to external influence factors able to break free from the initial efficiency-centered business model design. Business model development paths II and III are characterized by a stepwise approach to business model change. The first step in business model development path II is a business model transformation toward a complementarities-centered business model design. Firms accomplish this business model transformation step by solely changing the content element. Only in a second step, these firms focus on establishing a novelty-centered business model design by changing the structure element and the governance element of their business model. When pursuing business model development path III, firms in a first step transform their business models toward a lock-in-centered business model design by coevally changing the structure element and the governance element. To finally implement a novelty-centered business model design, these firms change

the content element in a second step. However, not all firms following business model development paths II or III are able to complete both transformation steps. Triggering events and self-reinforcing effects may prevent firms from achieving a novelty-centered business model design and either trap them in a complementarities-centered (business model development path II) or a lock-in-centered (business model development path III) business model design. Business model development path IV depicts a direct approach to achieving a novelty-centered business model design. When a firm follows this business model development path, it is not affected by path dependence after breaking free from the initial efficiency-centered business model design. Our study provides new insights on business model path dependence and thus contributes to a deeper understanding of barriers to business model innovation and transformation. In doing so, we considerably enhance business model literature (e.g. DaSilva and Trkman, 2014; George and Bock, 2011) that points to the relevance of path dependence in the context of business model change.

Our findings are of special interest from a managerial perspective. By uncovering the role of path dependence in business model change processes we provide an opportunity for managers to learn from the experience of others. We highlight in detail crucial triggering events and self-reinforcing effects that are of relevance in this context. Being aware of these factors enhances the probability that managers are not being trapped in a narrow scope of action that prevents them from changing an extant business model design that is not favorable for their firm. Nevertheless, an increased awareness of path dependence in the context of business model change does not necessarily prevent managers from being affected by mechanisms that constitute path dependence. Therefore, we point to the importance of external advisors such as business consultants. Due to not being embedded in firm-internal structures and processes, it is easier for them to recognize triggering events and self-reinforcing effects that lead to path dependence in business model change processes.

Naturally, we acknowledge that our study is not free from limitations. First, limitations in the context of our theoretical background have to be mentioned. The business model concept as well as the path dependence concept still lack clarity as researchers employ a variety of different definitions and understandings in this context. However, as we refer to theoretically well-developed and well-established conceptualizations (Amit and Zott's (2001) business model conceptualization and Sydow et al.'s (2009) path dependence framework) we are confident that our way of proceeding is appropriate. Next, limitations that go along with our

qualitative-empirical research need to be considered. Case study research is affected by limited generalizability (Yin, 2009). Moreover, our retrospective analysis based on interviews with key informants is challenging as changes in organizational structure or cognitive biases might influence the interviewed CEOs' perception of the past (Golden, 1992; Huber and Power, 1985). However, the conducted interviews provided valuable information on underlying decision making processes. As the information drawn from the interviews is completed by exaggerate archival data, we are sure that we were able to minimize possible negative effects related to this aspect. Furthermore, changes in the firms' business models were made quite recently and all interviewed CEOs were responsible for all business model changes that have been examined in our study.

Another aspect that needs to be considered is related to our case study sample. As we aimed at analyzing business model change processes triggered by service transition, our sample only consists of firms operating in manufacturing industries. We also limited our sample to firms with no more than 500 employees. This was necessary to ensure comparability (Eisenhardt, 1989). Hence, we encourage researchers to have a look at other research settings. It would be interesting to learn more about the relevance of path dependence in the realm of business model change in other industries as well as in larger firms. Furthermore, our findings provide first empirical evidence that business model change may – in contrast to business model literature (e.g. Amit and Zott, 2012; Mitchell and Coles, 2003) that often assumes a deliberate nature of business model change – also be the result of an emergent process. Hence, investigating the deliberate or emergent nature of business model change processes is another area of interest for future research. Additionally, analyzing linkages between business model change, path dependence, and firm performance would also be of interest. As the intriguing field of research we approach in this paper calls for further exploration, future research should take on where we have left off.

4.5 Uncovering the Role of Network Partner Collaboration in Business Model Innovation Processes of Average Market Players[5]

Abstract

Business model innovation is by now mainly understood as a strategic option for firms to enhance their competitiveness. As a result, business model innovation research usually focuses on outperforming firms that deliberately innovate their business models. We enhance this rather narrow perspective by analyzing business model innovation processes of average market players against the background of a multiple-case study. Our findings show that average market players do at least initially not deliberately pursue business model innovation. Instead, they experience business model innovation as a highly emergent and very often unintended process. In addition, we provide evidence that collaborating with customers and other network partners is a key element for average market players to successfully innovate their business models. The results of our study are reflected in a newly developed process model of average market player business model innovation.

Keywords: Business model innovation; average market players; network partner collaboration; process perspective; multiple-case study.

4.5.1 Introduction

Business model innovation is very often seen as an important way to increase competitiveness as it allows firms to benefit from new technological developments (Chesbrough and Rosenbloom, 2002; Dmitriev et al., 2014) and to exploit new business opportunities in today's fast changing business environment (Amit and Zott, 2012; Casadesus-Masanell and Zhou, 2013; Demil et al., 2015; Teece, 2010). Especially in mature industries where possibilities to innovate products and processes are limited (Oliva and Kallenberg, 2003), business model innovation provides according to Amit and Zott (2012) a – compared to product and process innovation – cost- and time-efficient opportunity to improve a firm's competitive position. However, innovating a business model is a highly complex task

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and many firms fail to successfully encompass changes of their business model (Chesbrough, 2010; Mezger, 2014; Tripsas and Gavetti, 2000). Even firms that had been successful in innovating products and processes in the past can be threatened by a competitor's disruptive business model innovation as they may lack the capabilities that are necessary to implement strategic changes at the business model level (Bock et al., 2012; Doz and Kosonen, 2010; Hamel and Valikangas, 2003; Mezger, 2014). Furthermore, the success of business model innovation may be affected by a firm's ability to change its basic business logic and to enhance the boundaries of the firm by integrating external network partners and customers into the business model. Therefore, it is necessary to employ a more critical view on business model innovation to explore the "dark side" of this phenomenon that is by now widely ignored by literature (Demil et al., 2015). Spieth et al. (2014), for example, point to the need to put more research effort into understanding the integration of stakeholders into business model innovation processes. Furthermore, the at least implicit assumption in business model literature that business model innovation is a deliberate process needs to be questioned – especially when having a look at established market players that are average in terms of performance. Business model innovation literature does by now not consider average market players as this literature stream mainly focuses on outperforming firms and striking examples of business model innovation (e.g. Amit and Zott, 2012; Casadesus-Masanell and Ricart, 2011).

We tackle this research gap by analyzing how average market players experience the process of business model innovation. Thereby, we aim at understanding barriers to and enablers of business model innovation in this context. Furthermore, we consider the role of collaboration in business model innovation processes as the aspect of partner-driven, emergent business model innovation is something that is by now underresearched. Against this background, the goal of our paper is to understand: *(1) How do average market players innovate their business models? (2) How does collaboration with external partners affect this business model innovation process?*

Our paper contributes to business model research as we show that business model innovation by average market players is an emergent rather than a deliberate process. While random opportunities can be a trigger for changes in the business model, average firms are often forced to adjust their business models to survive in a business ecosystem that changes due to business model innovation of other market players. Hence, our findings enhance the process-

related understanding of business model innovation (e.g. Cortimiglia et al., 2016; Frankenberger, Weiblen, Csik, and Gassmann, 2013) that by now mainly focuses on deliberate business model innovation processes. Our paper not only sheds light on the challenges of average market players in the context of business model innovation, but also shows that business model innovation is not under all circumstances an appropriate and efficient option for this type of firms. Additionally, we follow a call by Spieth et al. (2014) who consider modes of firm-level collaboration and its effect on business model innovation as an intriguing and by now unsolved research question. As far as we know, we are the first to analyze business model innovation processes of average market players in conjunction with inter-firm collaboration. By doing so, we explicitly emphasize the ecosystem perspective that is implicitly prevalent in business model research.

4.5.2 Theoretical Background

While research interest on business models is rapidly increasing since the concept became popular with the emergence of web-based firms in the late 1990s (Zott et al., 2011; Osterwalder et al., 2005; Schneider and Spieth, 2013), researchers still do not agree upon a unified definition of the concept (Demil et al., 2015; Frankenberger, Weiblen, and Gassmann, 2014; George and Bock, 2011). Nevertheless, researchers emphasize that the business model is a useful tool (George and Bock, 2011; Morris et al., 2005 Casadesus-Masanell and Ricart, 2010) as it explains the *"...logic of the firm, the way it operates..."* (Demil et al., 2015: 3), and *"... the design or architecture of the value creation, delivery, and capture mechanisms"* (Teece, 201: 172) the firm employs. Hence, the business model is a new unit of analysis (Zott and Amit, 2013) at an intermediate level between the focal firm and its stakeholders (Zott et al., 2011) that allows decision makers to describe and analyze the system of interdependent value creation activities that are performed by the focal firm as well as its network partners and customers (Cortimiglia et al., 2016; Zott and Amit, 2010). Furthermore, the business model provides a linkage between the strategy level and the operational level (Cortimiglia et al., 2016) as a business model can be regarded as the *"...reflection of a firm's realized strategy"* (Casadesus-Masanell and Ricart, 2010: 195).

Employing a static perspective on business models that is related to a description or classification of business model components and their interrelationships (e.g. Amit and Zott, 2001; Chesbrough and Rosenbloom, 2002; Osterwalder and Pigneur, 2004) is not sufficient as

business models need to be adjusted and developed over time to match changing conditions in the business ecosystem (Bucherer et al., 2012; Demil and Lecocq, 2010; Teece, 2010). Business model innovation is often associated with radically new business models that represent a driver of growth and competitive advantage (Amit and Zott, 2012). In this context, researchers very often employ an entrepreneurial perspective by analyzing the potential of new value creation logics (Demil et al., 2015). In contrast, a more differentiated and still rather new perspective on business model innovation focuses on different types of business model innovation. In general, radical and incremental approaches to business model innovation have to be distinguished (e.g. Bucherer et al., 2012; Demil and Lecocq, 2010). Radical business model innovation involves changing the value creation logic, while incremental adjustments and improvements of an existing business model can be referred to as business model development (Schneider and Spieth, 2013). Some researchers emphasize that business model innovation always has an effect on the industry or the market (e.g. Snihur and Zott, 2013; Markides, 2006); others employ a more firm-internal perspective on business model innovation (e.g. Cavalcante et al., 2011; Sosna et al., 2010) Furthermore, different triggers of business model innovation are highlighted. Interestingly, Bucherer et al. (2012) distinguish not only between external and internal factors (see also Demil and Lecocq (2010)), but also emphasize that business model innovation results from opportunities as well as threats.

The adherent opportunity-related perspective on business model innovation is further challenged by Khanagha et al. (2014) who highlight that disruptive business model innovation itself can be a threat. They emphasize that this is especially of relevance for established firms as business model innovation goes along with a high level of complexity and uncertainty – an aspect we need to consider especially in the context of average market players we analyze in this paper. A second aspect of relevance is that business model innovation may cannibalize a firm's extant business model especially if external pressure forces the firm to innovate. Extensive resource requirements are mentioned by Khanagha et al. (2014) as the third major challenge for business model innovation.

Some researchers (Amit and Zott, 2012; Demil et al., 2015) emphasize that new resources are not necessarily mandatory for business model innovation as even under conditions of resource scarcity business model innovation could be initiated by a recombination of existing resources. However, the extant business model is very often required as financial buffer to

cross-subsidize new business models (Bohnsack et al., 2014; Sosna et al., 2010). Therefore, firms tend to implement dual business models (Markides and Charitou, 2004), which delimits the opportunity to recombine existing resources as these resources are still embedded in the extant business model. This is acknowledged by researchers (e.g. Cavalcante et al., 2011; Sosna et al., 2010) who highlight the relevance of a lack of resources as a barrier to initiate and implement business model innovation.

While all types of market players are forced to deal with upcoming threats, they fight these threats in a different way. Opportunities are also in general the same for all types of market players. However, resource constraints and a lack of capabilities delimit small firms as well as average market players in pursuing specific opportunities (Bohnsack et al., 2014). For these market players the right timing to innovate a business model is crucial. Both, the market as well as the value network, need to be sufficiently developed for a business model to successfully take off (Khanagha et al., 2014). Literature (Håkansson and Ford, 2002; Hewitt-Dundas, 2006) points to the importance of network partners in overcoming resource constraints. Business model innovation is very often seen as a strategic tool to improve competitiveness in a deliberate way (Amit and Zott, 2012; Mitchell and Coles, 2003). However, some researchers argue that business model innovation can result from emergent changes as well (Demil and Lecocq, 2010). Khanagha et al. (2014) explain that established firms that have to deal with a high level of uncertainty which goes along with business model disruptions often cannot enforce deliberate business model changes. Cortimiglia et al. (2016: 418) emphasize the deliberate nature of business model innovation processes and highlight that *"... in most cases* [strategic] *planners outperform non-planners..."*. Hence, the possibility of an emergent business model innovation process needs to be taken into account when analyzing average market players as these market players may lack strategic planning.

Additionally, most researchers agree on the importance of integrating network partners and other stakeholders in business model innovation processes (e.g. Amit and Zott, 2012; Frankenberger, Weiblen, Csik, and Gassmann, 2013; Giesen, Riddleberger, Christner, and Bell, 2010). Opening up the business model (Chesbrough, 2011; Frankenberger et al., 2014) to allow for an integration of external partners is a highly complex challenge. Especially for average market players it has to be taken into account that they may not be experienced in collaborating with network partners and may not have the reputational benefits to attract new network partners.

4.5.3 Research Design

4.5.3.1 Selection of the Applied Research Approach

We argue that a qualitative research design is particularly appropriate to tackle our research questions. Qualitative research is well suited to answer how or why questions (Anteby et al., 2014) as it allows to gain rich data and thus deep insights into rather new and by now still underresearched topics (Eisenhardt and Graebner, 2007). Moreover, it helps to acquire knowledge about underlying drivers of decision making processes within organizations (Bluhm et al., 2011) and thus to deeper understand complex phenomena (Graebner, Martin, and Roundy, 2012; Marshall and Rossman, 2006). Although Cortimiglia et al. (2016) call for quantitative testing in the realm of business model research, Demil et al. (2015) argue that theory-building work is still needed. Regarding business model innovation processes, the boundaries between the research object and its context are not clearly evident. Furthermore, these processes cannot be analyzed within predefined stages (Dmitriev et al., 2014). Hence, contextualization needs to take place what clearly calls for a qualitative research design (Welch et al., 2011; Yin, 2009).

We decided to follow an inductive theory-building case study approach (Eisenhardt, 1989; Gioia et al., 2013) without developing propositions based on prior research in advance to our study (as for instance recommended by Yin (2009) or Zhao, Anand, and Mitchell (2005)). However, we acknowledge prior research and are aware of its findings. Hence, we explicitly do not follow a grounded theory approach in its strict sense as suggested by Glaser (1992) who claims that prior knowledge would limit new insights. Instead, we employ a "prior informed" approach (Strauss and Corbin, 1990) which is less ignorant against prior research.

4.5.3.2 Research Setting

Following suggestions by case study literature (e.g. Eisenhardt, 1989; Eisenhardt and Graebner, 2007) we selected 10 case firms – a suitable number for case study research (Eisenhardt, 1989). To ensure that the cases are in line with our research focus on average market players, we selected case firms based on several criteria. First of all, we chose case firms that are (1) neither market leaders nor niche market leaders. Furthermore, we used benchmarking to select firms with (2) key performance measures that are average; and (3) we excluded firms that experienced severe losses in the past five years as firms that may face

bankruptcy are not in our research focus. We (4) included traditional manufacturing firms as well as service firms in our sample in order to control for environmental variation. However, we followed suggestions by Eisenhardt (1989) and constrained variation by (5) focusing on a business-to-business setting in the German market to clarify the domain of our findings. All case firms are small- and medium-sized with a number of employees between 25 and 250.

In addition to this purposeful (Denzin and Lincoln, 2005; Patton, 2002) or theoretical (Eisenhardt, 1989; Eisenhardt and Graebner, 2007) sampling approach, we used Yin's (2009) replication logic and preselected firms that seem to be (a) rather innovative or (b) rather traditional. We searched firm websites for indication of innovative products, innovative processes, or even recent changes in the business model. This contrary sampling of "polar types" is suggested by case study literature (Eisenhardt and Graebner, 2007; Yin, 2009) as it allows for an examination of contrasting patterns and thus contributes to theory development. More details on our ten case firms are provided in table 4.5–1. The names of the firms are fictitious to ensure anonymity (Gioia et al., 2013).

Case firm	Industry (SIC code)	Number of employees	Ex-ante indication of innovation	Ex-post assessment of innovation importance	CEO background
consulting	8748 – business consulting services, not elsewhere classified	25	Strong	Strong	Owner-manager with engineering background
furniture	2522 – office furniture, except wood	120	Strong	Strong	Owner-manager of family business with business administration background
glass	3211 – flat glass	240	Medium	Weak	Manager with engineering background
guard	7381 – detective, guard, and armored car services	130	Weak	Weak	Owner-manager of family business with business administration background
machinery	3531 – construction machinery and equipment	50	Medium	Weak	Owner-manager of family business with engineering background
programming	7371 – computer programming services	30	Medium	Strong	Owner-manager with engineering background
systems	7373 – computer integrated systems design	25	Weak	Weak	Owner-manager of family business with business administration background
textile	2299 – textile goods, not elsewhere classified	250	Strong	Strong	Manager with engineering background
tools	3532 – machine tools, metal forming types	50	Weak	Medium	Owner-manager with business administration background
transport	4449 – water transportation, not elsewhere classified	80	Weak	Medium	Manager with engineering background

Table 4.5-1: Description of case firms.
Source: Own illustration.

4.5.3.3 Data Collection

In-depth, semi-structured interviews with the CEOs of our case firm are one important data source as the CEO's reports allow us to gain retrospective as well as real-time accounts (Gioia et al., 2013) of decisions made related to business model innovation. As suggested by Gioia et al. (2013), we paid special attention to develop the interview guideline according to our research questions, but allowed modifications as data collection progressed. The interviews were open-ended and the interviewees were free to express their point of view. Additionally, the interview guideline included questions ensuring that we are able to examine the value creation, value delivery, and value capture (Teece, 2010; Osterwalder and Pigneur, 2004) dimensions of the case firm's business models as well as determinants of business model innovation. The interviews were conducted between June 2014 and January 2015 by two researchers at the premises of the case firms and lasted about 90 minutes on average. All interviewees allowed us to tape record the interviews which were then carefully transcribed. As a second data source we collected additional, publicly available data (e.g. financial statements, press releases, newsletters) concerning the case firms. This allowed us to triangulate data (Gibbert et al., 2008; Yin, 2009) and to cross-check the retrospective perceptions of the interviewed CEOs. Follow-up phone calls helped us to clarify the very few inconsistencies between CEO reports and archival data that occurred.

4.5.3.4 Data Analysis

Following suggestions by literature (Eisenhardt, 1989; Ram and Trehan, 2009) we conducted an iterative data analysis process. First, we synthesized and organized data from both data sources by creating write-ups for each individual case. As suggested by Langley (1999) we identified critical incidents in each case history by carefully retracing case histories. The within-case analysis allows us to gain a deep understanding and to recognize unique patterns within each individual case (Eisenhardt, 1989). In a next step, a cross-case analysis helped to compare these patterns in an objective way. To do so, we again followed suggestions by case study literature (Eisenhardt, 1989). We, for instance, selected categories that emerged during the within-case study and checked for differences and similarities across case firms. Furthermore, we compared case firms in pairs to recognize more subtle differences. The highly iterative process of analyzing case data was carried out by two researchers independently to enhance rigidity and to ensure consistency of our findings.

4.5.4 Findings

A brief summary of the findings related to our ten case firms is presented in table 4.5–2. Our within-case analysis shows that the process of changing a firm's business model is for average market players mainly an emergent and not a deliberate process. The business model is usually not explicitly discussed in meetings of the top management team. Only some CEOs (*programming, consulting, furniture, and textile*) explained – after we explicitly asked – that they are aware of the business model concept and consider it in their decision making process. Hence, business model innovation is usually not a change process that is initiated top down, but rather a learning process as firms in our sample either react to random opportunities without active opportunity seeking activities or are forced to implement changes due to external threats. The results of the within-case analysis allow for the assumption that business model innovation of average market players is a stepwise process that is mainly triggered by external factors.

	Change drivers	**Business model change**	**Network perspective**
furniture	▪ Initial business model development triggered by new opportunities provided by the business environment ▪ Reaction to network partners' suggestions instead of active opportunity seeking	▪ Initial adjustments mainly affected value creation dimension (integration of network partner activities) ▪ Redesign of value delivery dimension as a second step ▪ Today: continuous, deliberate business model innovation initiated by collaboration with network partners	▪ Inherent openness toward network partners ▪ Network partners are crucial providers of resources to enhance value proposition ▪ Today: central network position allows firm to orchestrate all activities in the value network
textile	▪ Initial business model development triggered by severe crisis that threatened firm survival ▪ Severe industry disruptions could not be ignored	▪ Initial adjustment mainly affected value delivery dimension to counteract shifts in customer behavior ▪ Strong customer integration as a consequence of initial change affected value creation dimension (resources, networks) ▪ Today: deliberate design and flexible redesign of platform-based business model	▪ Customers as most important network partners (strong ties) are the main source of information ▪ Focal firm has a central position within the value network ▪ Focal firm orchestrates a vast net of additional network partners (weak ties)

glass	▪ Despite heavy competition no external triggers that force focal firm to change business model ▪ Isomorphism within industry influences CEO's decision making	▪ Despite product and process innovation no business model development or innovation ▪ Business model is similar to competitors' business model	▪ Firm-centered perspective ▪ Traditional value chain logic; no network perspective
machinery	▪ Organizational changes are triggered by external opportunities and enabled by internal structural changes ▪ Reactive rather than proactive changes	▪ Changes in value delivery dimension result from trial-and-error-based operational changes ▪ No planned strategic changes	▪ Firm-centered perspective ▪ No openness toward external partners ▪ However, customer-orientation is slowly developing
tools	▪ Threat-driven business model development ▪ Active changes initiated before external developments forced firm to react	▪ Value delivery dimension was actively changed ▪ Changes also affected value creation dimension, however only internal structures needed to be aligned ▪ Deliberate decision against business model innovation (no pressure to do so)	▪ Some key customers are regarded as network partners and integrated into the business model (strong ties) ▪ Otherwise rather firm-centered perspective; weak network ties to supply-side partners are not actively used
consulting	▪ Recent business model innovation is proactive and opportunity-driven ▪ However, owner-manager has experience with business model development and business model innovation; he went through emergent business model innovation process with prior firm	▪ Value delivery dimension as a starting point of business model innovation ▪ Implementation of dual business models; cross-subsidization of new business model by initial business model ▪ Termination of initial business model planned in the long run	▪ Strong network partner orientation ▪ Transfer of network partners from prior firm possible due to founder's reputation and social capital ▪ Customer integration also prevalent, but plays a minor role
systems	▪ No external triggers that force firm to change the business model ▪ No internal intention to change	▪ No business model development or innovation ▪ Business model is designed around central network partner ▪ Focal firm is not fully free to change business model	▪ Strong dependence upon one central, dominant network partner (main input supplier) ▪ Otherwise no openness toward network partners

programming	▪ Business model development triggered by new opportunities provided by the business environment ▪ Reaction to customers' suggestions instead of active opportunity seeking ▪ However, recognition of potential business model designs though observation of market players beyond industry boundaries	▪ Business model development mainly affects value delivery dimension ▪ Alternative business model configurations have been discussed ▪ Deliberate decision against business model innovation (risk of failure if customers do not accept new business model; resource constraints impede market entry with new business unit)	▪ Strong network orientation, but still rather firm-focused business model ▪ Network partners cooperate e.g. in research and development projects; however, they do not pool resources on a business model-level (limited openness, limited trust among network partners)
transport	▪ Business model development triggered by new opportunities provided by the business environment ▪ Reactive rather than proactive changes	▪ Business model development mainly affects value delivery dimension ▪ Business model is designed based on cost-intensive infrastructure ▪ Business model innovation is impossible due to limited tangible and financial resources ▪ Alternative utilization of existing resources does not promise increasing revenues	▪ Network partners (suppliers) play a major role in business model as they provide complementary products and services ▪ However, integration of network partners is not institutionalized; no general openness ▪ Existing network already exploited as much as possible; extension of network no longer possible without radical business model changes
guard	▪ Organizational changes triggered by new opportunities provided by the business environment ▪ Organizational changes result from imitation of competitors	▪ Extension of existing business model (complementary services); basic business model and value creation logic remains the same ▪ Change was intended, but business model dimensions were not considered in decision making process	▪ Firm-centered perspective ▪ No openness toward external partners

Table 4.5-2: Results of the within-case analysis.
Source: Own illustration based on case data.

4.5.4.1 Phase 1: Monitoring the External Business Model Fit

All case firms have in common that they usually do not invest a lot of time and effort in a systematic analysis of the business ecosystem. They observe their direct competitors, the current customer segments they serve, as well as general political or technological developments. However, they do not make use of analytical systems that allow them to sense and filter new opportunities that result from developments outside their industry scope. The firms' basic business logic plays an important role in this context. Two firms in our sample

(*glass, systems*) base their decisions regarding the business model solely on developments within their industry. *Glass* has a strong focus on competitors' movements and would never consider a business model design that is not in line with the industry's current value creation logic. *Systems*, on the other hand, follows the value creation logic of its most important business partner who is a supplier that is essential for *systems'* current business model. Both CEOs mentioned that their firms are "part of the game" and that changing market rules is not possible for them. Due to this viewpoint, the CEOs refuse to think outside the box and thus fail to recognize new opportunities. As a result, these firms do not engage in business model development and do not consider business model innovation.

As figure 4.5–1 shows, all other firms in our sample at least recognized that their current way of doing business is not perfectly matching changing ecosystem conditions. Usually critical incidents triggered this insight. While some of our case firms are able to sense the business model misfit on their own (*consulting, programming, guards, transport*), other case firms make use of information provided by network partners and customers (*furniture, textile, tools*). CEOs of the latter group emphasized the value of network partner or customer suggestions. A certain openness toward network partners has either always been a part of the organizational culture (*furniture, tools*), or the firms learned over time to integrate external knowledge sources in order to survive in difficult industry settings (*textile*).

4.5.4.2 Phase 2: Adjusting and Improving Business Model Components

Firms that were able to recognize a misfit in their way of doing business start to implement changes. However, this does not necessarily mean that these firms change their business model in an adequate way. To do so, firms need to employ a business model perspective in order to make systematic changes of particular business model components. In two cases (*machinery, guards*) we observed changes in the business model especially when analyzing archival data. However, as we analyzed the CEO reports in detail, we saw that these changes are neither intended nor emerged from strategic decisions. They are operational in nature and result from a trial-and-error-process. These two case firms not only lack deliberate strategic planning (as is holds true for most of our case firms), they also do not consider – or do not even know about – interdependencies among business model components. Therefore, we cannot classify the encompassed changes as business model development.

The remaining firms in our sample show a more target-oriented behavior when it comes to implementing changes and thus enter the second phase of the business model innovation process (see figure 4.5–1). Some CEOs (*transport, tools*) approach business model development in a rather intuitive way without employing a strategic perspective on business model development. Nevertheless, they are aware of the interrelations among different value creation activities. The CEOs of *tools*, *programming*, and *transport* made internal adjustments to their firms' business models by either redesigning the value creation dimension (*transport*) or the value delivery dimension (*tools, programming*). However, these changes did not considerably affect firm capabilities or the resource endowment. Moreover, the underlying basic business logic remains the same. The CEOs of *programming* and *tools* further explained that they discussed more radical business model changes (e.g. changing the revenue model and thus offering a completely different value proposition). However, they decided not in favor of this innovative move as the perceived risk of innovating the business model was considered more relevant than a possible increase in profits. All in all, although business model development emerged from a variety of planned and unplanned steps, the decision not to develop the business model any further was fully intentional.

4.5.4.3 Phase 3: Opening up the Business Model

In contrast to all other firms, the adjustments and improvements of the business models of the case firms *consulting*, *furniture*, and *textile* resulted in opening-up their business models (see figure 4.5–1). They not only changed internal aspects of the business model (as *transport, tools* and *programming* did), but also redefined the boundaries of their firms. What distinguishes these three firms from the other seven case firms is the fact that they heavily benefit from employing a system-level perspective on how to do business. *Textile* integrated customers into their value creation processes to enable value co-creation. Thus, the firm considerably changed the value delivery dimension in a first step and later on adjusted the value creation dimension and the value capture dimension. In contrast, *furniture* focused on network partner integration and thus changed the value creation dimension in a first step. *Consulting* slowly changed the customer perspective and the network partner perspective at the same time.

4.5.4.4 Phase 4: Business Model Innovation

Consulting, *furniture*, and *textile* are the only firms in our sample that innovated their business model. However, this was not a deliberate decision as they went through the same incremental and emergent process of changing their business models. As a result of going through all these steps, these firms now employ a business model that is distinct from the business model well-established in the respective industry. Hence, we see that a series of emergent developments results in an innovative business model. Thereby, for average market players the main obstacle to business model innovation seems to be the basic business logic. A strongly firm-centered business logic prevents firms from opening up the boundaries of the firm to benefit from network partner and customer resources and capabilities that help these firms to successfully pursue market opportunities.

According to our case data, business model innovation is for average market players mainly an emergent and stepwise learning process. Each step these firms make allows for a deeper understanding of markets and a new evaluation of opportunities and threats. Our cases clearly indicate that deliberate business model innovation only happens after a firm has developed specific interaction capabilities and a capability-based reputation that allows other firms to easily identify them as suitable partners. Established network relations signal a willingness to collaborate with partners. Against this background, firms are able to further enhance their network in size and quality. Within these newly evolving networks, firms pool their resources and capabilities and thereby enhance value creation opportunities for all network partners. As a result, each network partner benefits from a more stable potential to capture value. Moreover, the network embeddedness reduces the risk to be negatively affected by ecosystem changes due to a better access to information within the network. In other words: by passing the first three steps of the process identified, firms develop the ability to deliberately innovate their business model. Therefore, we assume that business model innovation processes follow different rules for firms that already successfully innovated their business model and for firms that did by now not succeed in innovating their business model (see figure 4.5–1).

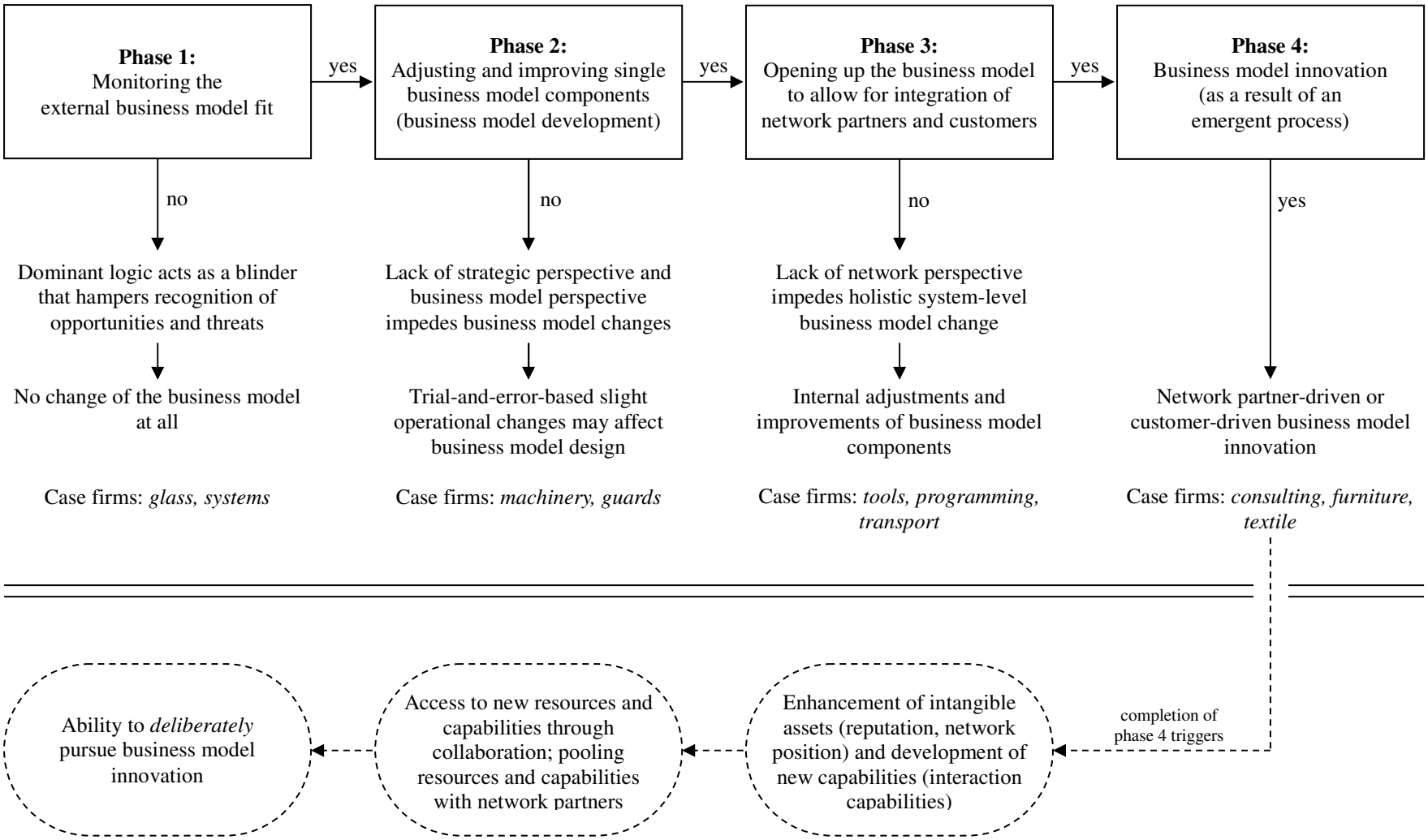

Figure 4.5-1: Business model innovation process of average market players.
Source: Own illustration based on case data.

4.5.5 Discussion and Conclusion

The findings of our multiple-case study provide evidence that business model innovation is for average market players the result of an emergent, trial-and-error-based process. The emergent nature of business model innovation processes is by now only highlighted by very few existing studies (e.g. Khanagha et al., 2014; Sosna et al., 2010). However, these studies address different research contexts and do not explicitly focus on average market players. In contrast to these studies, our findings show that average market players do not actively pursue business model innovation when entering the business model innovation process. Therefore, insights provided by literature that develops normative approaches to business model innovation (e.g. Frankenberger, Weiblen, Csik, and Gassmann, 2013) cannot be transferred to our research context as applying such a process model requires that a firm is aware of entering a business model innovation process. In contrast to Frankenberger, Weiblen, Csik, and Gassmann (2013) who assume that the basic business logic does not affect the recognition of business model innovation as strategic option, our findings show that the existing firm dominant logic (Prahalad, 2004; Prahalad and Bettis, 1986) may prevent a firm to question it's extant business model.

According to our findings, the business model innovation process of average market players is incremental in nature and consists of four steps: (1) monitoring the external business model fit; (2) adjusting and improving single business model components; (3) opening up the business model to allow for an integration of network partners and customers; and (4) business model innovation. However, not all firms complete the business model innovation process. While not completing the first or second phase of the business model innovation process is usually not a conscious decision, stepping out of the process in phase three is often intentional. In the first case, a preoccupation with the operational business as well as cognitive barriers (as already emphasized by e.g. Chesbrough (2010)) are the reasons for not completing the process. Related to the latter case, the results of our study point to divergent firm objectives as rationale for quitting the business model innovation process. Therefore, we see that pursuing business model innovation is not always suitable for average market players as for these firms an average, but stable market position is more favorable than the chance to generate uncertain profits out of business model innovation. This finding is basically in line with Khanagha et al. (2014) who emphasize that managers of established firms often try to preserve the extant competitive advantage of their firm as long as possible. In this context, we

see that firms follow a strategy of exploitatively strengthening the extant business model (as e.g. highlighted by Osiyevkyy and Dewald (2015)).

Khanagha et al. (2014) argue that an incremental business model development process does not affect the firm's basic value creation mechanisms and that abandoning the extant business model is usually triggered by extensive ecosystem shifts. Our findings contrast this insight as at least the first business model innovation of average market players always results from a series of incremental development steps that have an influence on basic value creation mechanisms. Furthermore, although external opportunities and threats may trigger the emergent business model innovation process, only by collaborating with network partners and customers average market players are able to successfully implement innovative business models. The incremental steps that precede business model innovation are a precondition to initiate collaboration. Completing all four phases of the business model innovation process triggers a self-reinforcing effect that in the following enables average market players to proactively and deliberately innovate their business models without being affected by ecosystem shifts.

Interestingly, our case findings show no difference in the process of average market player business model innovation related to industry, firm type, or CEO background. Furthermore, the presence of an owner-manager does not seem to play a role in this process either, no matter whether the respective firms act in a competitive or less competitive environment. Thus, our results are not in line with Velu and Jacob (2016) who explicitly highlight the role of owner-managers in innovation processes. This leads to the assumption that the market position strongly determines how a business model innovation process looks like. Against this background, future research should employ a differentiated perspective on business model innovation processes with regard to a firm's market position. Furthermore, the emergent nature of business model innovation calls for the application of research methods that help to uncover processes firms are very often not explicitly aware of.

We are well aware that case study research goes along with certain limitations. Especially the generalizability of case study findings is often questioned. However, according to Yin (2009) analytic generalizability and statistical generalizability have to be distinguished. In contrast to statistical generalizability, analytical generalizability does not focus on generalizing findings in the context of a defined sampled population, but on broader insights related to a phenomenon being studied. We are aware that we cannot claim statistical representativeness,

but we are confident that the patterns identified in our multiple-case study are of relevance in a much broader context. Furthermore, we need to acknowledge that our findings are based on a German sample. However, influence factors that call for business model innovation (such as technological advancement or intensified international competition (Teece, 2010)) are not peculiarities of the German market. Therefore, we do not see that the German sample restricts the explanatory power of our findings.

All in all, our paper contributes to a deeper understanding of business model innovation processes with regard to average market players. We show that business model innovation is – in contrast to existing literature – at least for average market players not an opportunity-driven, deliberate strategic option, but the result of an emergent, often unintended process. Thereby, we provide a new perspective on business model innovation. Furthermore, our research points to the importance of collaboration in successful business model innovation processes of average market players.

5 Putting the Insights Provided by the Thesis in a Nutshell

5.1 Theoretical and Managerial Implications

Researchers (e.g. Ostrom et al., 2015; Spring and Araujo, 2009; Storbacka, 2011) emphasize the need to employ a business model lens in order to provide holistic insights and an in-depth understanding how manufacturing firms approach product-service transition. Yet there is little known about how manufacturing firms actually design business models as a response to product-service transition or how the business model change takes place. This thesis tackles this research gap by employing the business model concept as a new unit of analysis to examine manufacturing firms' product-service transition. The thesis yields theoretically grounded and empirically-based findings that provide intriguing insights how service-related strategies of manufacturing firms are translated into business model configurations, how they are implemented on an operational level, and how underlying mechanisms influence the change process that occurs when manufacturing firms implement new, service-related business models. Several substantial insights related to the three research objectives that are identified in chapter 1 have to be highlighted:

(1) With respect to the first research objective – the identification of characteristics of business models that are established by manufacturing firms to support service-related strategies – this thesis particularly extends product-service transition literature by highlighting two major insights that are of relevance in this context.

First, the papers presented in subchapters 4.1, 4.2, 4.3, and 4.4 of this thesis show that manufacturing firms need to implement new business models in order to pursue specific service-related strategies. While the first two papers describe and explain business models of manufacturing firms characterized by a highly service-oriented business logic, the third and fourth paper show that product-service transition not only results in one particular business model configuration. Instead, manufacturing firms can make use of very different business model designs in order to benefit from service-related opportunities. Thus, the overall findings of this thesis provide empirical support that manufacturing firms can deal with product-service transition in multiple ways. Not all manufacturing firms follow a common, best-practice service strategy that leads them more and more toward being a service provider. This finding stands in strong contrast to the basic assumption that product-service transition

occurs along a product-service continuum (Oliva and Kallenberg, 2003). The different service-related strategies that are identified in the context of this thesis lead to different business models that cannot be described along the product-service continuum. Instead, multiple dimensions need to be considered when formulating service-related strategies in manufacturing firms that not only concern the product-market dimension that is often highlighted in studies on product-service transition (e.g. Fang et al., 2004; Tukker, 2004), but also a cognitive dimension that concerns how customers and other network partners are approached when manufacturing firms increase their focus on service. Thus, the thesis considerably enhances product-service transition literature by overcoming the basic assumption about the product-service continuum that – according to Kowalkowski et al. (2015) – often hampers progress in this field of research. Moreover, by characterizing the different business models manufacturing firms employ in the context of product-service transition in detail (see especially table 4.3–3, but also table 4.2–3) this thesis helps to minimize the research gap Ostrom et al. (2015) identified in this context.

Second, the empirical results of this thesis (see especially the third and in parts the fourth paper presented in subchapters 4.3 and 4.4) reveal that many manufacturing firms place a particularly strong emphasis on service and make use of a highly service-oriented business logic. Interestingly, the business models these manufacturing firms employ are utterly different from business models of manufacturing firms that still follow a product-centric business logic. The empirical findings concerning the characteristics of business models are in line with the theoretical considerations based on service-dominant logic undertaken in the first two papers of this thesis (see subchapters 4.1 and 4.2). Thus, the overall results of the thesis provide evidence that manufacturing firms that heavily rely on service-related strategies are able to support these strategies by implementing novelty-centered business models.

These innovative business models allow manufacturing firms to benefit from providing service-based offerings. However, the thesis highlights that shifting the focus toward service-based offerings is not enough. Additional aspects manufacturing firms need to consider when designing innovative business models are uncovered in this thesis. Coevally analyzing numerous aspects as well as their interrelations was possible by employing a business model-level to analyze manufacturing firms' product-service transition. In particular, this thesis reveals that the reorganization of existing resources is dependent on the particular business model configuration a manufacturing firm chooses as a strategic response to product-service transition. Moreover, it shows how new service-related capabilities, that manufacturing firms

need to develop to pursue product-service transition, interplay with other elements of a business model. Manufacturing firms that aim at implementing a novelty-centered business model consider new ways of structuring network relations in order to allow for interconnected network interactions among multiple partners. To facilitate such a new perspective, they need to adjust their capabilities. According to the results of this thesis, these manufacturing firms show particular capabilities to manage and guide the network partners that are of relevance for the firms' business model. By analyzing interrelations among various aspects this thesis considerably enhances prior literature that focuses on single aspects such as the role of resources or capabilities in product-service transition (e.g. Antioco et al., 2008; Salonen, 2011; Ulaga and Reinartz, 2011). Moreover, while for instance Kowalkowski et al. (2013) point to the need to identify adequate network relations – so-called value constellations – that support product-service transition, the findings of this thesis describe how these network relations look like.

Furthermore, the results of this thesis show how the network relations interplay with other firm activities on a business model level (see table 4.2–3, table 4.3–3, and figure 4.1–2). Business models of manufacturing firms that place high emphasis on service need to support novel mechanisms to monitor and incentivize network partner collaboration. In this context, this thesis goes beyond focusing on specific types of contracting mechanisms as usually discussed in the realm of product-service transition literature (e.g. Hypko, Tilebein, and Gleich, 2010; Kim et al., 2007) but also highlights the need to embed informal governance mechanisms and intrinsic incentives into the business model design as well. According to the overall results in this thesis, a strong focus on informal governance mechanisms such as relational or trust-based mechanisms (Dyer and Singh, 1998; Faems et al., 2008) does not imply that formal governance mechanism are not relevant at all. This finding contrasts research (e.g. Dyer and Singh, 1998; Granovetter, 1985) that regards formal and informal governance mechanisms as substitutes. Ghoshal and Moran (1996), for instance, even argue that the existence of formal governance mechanisms would indicate distrust. Instead, the findings in this thesis support researchers (e.g. Poppo and Zenger, 2002; Woolthuis, Hillebrand, and Nooteboom, 2005) who stress that formal and informal governance mechanisms can also be seen as complements. By utilizing both types of governance mechanisms at the same time, manufacturing firms can safeguard core competences and foster the exchange and creation of knowledge within the network. Firms that employ business model configurations in which informal governance mechanisms play a particularly important role still make use of formal governance mechanisms. However, these formal governance

mechanisms are regarded as a necessary safety measure in business relations, but not as a signal of distrust. As Woolthuis et al. (2005) argue, for firms that build their business on trusting inter-organizational relations (as is the case in lock-in-centered and novelty-centered business model designs identified in this thesis) formal governance mechanisms work as a tangible expression of trust.

From a managerial perspective, the characterizations of specific business model configurations that support different service-related strategies in manufacturing firms (see especially table 4.3–3 of this thesis but also the findings of subchapters 4.1 and 4.2) are particularly useful as they represent a framework and a guideline for managers that are responsible for product-service transition decisions. The findings of this thesis reveal that there is no best practice solution regarding product-service transition-triggered business model configurations. Nevertheless, the generic business model configurations that are characterized and categorized in subchapter 4.3 provide a holistic picture on the interplay between a firm's offerings, the resources and capabilities needed to provide them, the structures necessary to interact with customers and network partners, as well as the governance mechanisms to monitor business activities. This helps managers to identify potential service-related strategies and respective business model configurations that match the firm-external as well as firm-internal contingencies their firms have to deal with. Furthermore, the framework is useful to determine which elements require change if a particular business model configuration needs to be implemented as current business model properties can be compared to the business model configuration the managers strive for.

(2) As a second research objective, this thesis aims at analyzing how manufacturing firms change their business models in order to meet newly evolving market conditions. While the papers in this thesis show that product-service transition can be an adequate response to a changing ecosystem, the results also demonstrate that product-service transition is not a cure-all solution that is easy to implement. To benefit from service-related strategies, manufacturing firms need to considerably change their business models – an according to the results of the empirical research of this thesis highly complex process. This thesis provides an in-depth answer to the question how this change occurs. Especially the last two papers (see subchapter 4.4 and 4.5) uncover the mechanisms underlying business model change. Thus, this thesis considerably extends product-service transition literature that by now does not tackle this topic in detail, although the need to change the business model in order to benefit from product-service transition is mentioned by prior research (e.g. Kindström et al., 2013;

Kowalkowski, 2010), The findings reveal that new business models that support manufacturing firms' product-service transition cannot be implemented instantly. In contrast, the business model change occurs in steps and therefore takes time. By employing a processual perspective on the topic, this thesis sheds light on how product-service transition necessitates business model change and thus contributes to product-service transition literature. Moreover, it considerably extends business model innovation literature as the processual perspective allows for tackling the underresearched topic of how established firms accomplish business model change. Two major insights have to be highlighted:

The first insight is related to the degree of innovativeness of business model change. Although the analysis of manufacturing firm business model characteristics (see especially subchapter 4.3) reveals that some manufacturing firms make use of innovative, new-to-the-industry business models, the processual perspective on business models (see subchapters 4.4 and 4.5) shows that the change process resulting in such business models is usually not a radical one. More often, the business models change process triggered by product-service transition is incremental in nature. Two reasons for this incremental change can be identified. First, manufacturing firms are very often not able to radically change their business models due to restrictions in resources or a lack of capabilities. Second, radical changes to the business model do not seem to be beneficial for many manufacturing firms. As business model change in the context of product-service transition goes along with risks, an incremental change seems to be a better solution as manufacturing firms can control the change process more tightly. Researchers still largely ignore to consider risks that result from product-service transition (Nordin et al., 2009). Thus, this finding is interesting for product-service transition literature as it provides first indication how manufacturing firms deal with the risks involved in product-service transition-triggered business model change.

By highlighting the incremental nature of business model change processes related to product-service transition, this thesis stands in contrast to earlier work on product-service transition (e.g. Gebauer and Friedli, 2005; Oliva and Kallenberg, 2003), which – at least implicitly – assumes that product-service transition is the result of few, very radical changes. Thus, this thesis supports the small number of researchers (e.g. Kowalkowski et al., 2012; Matthyssens and Vandenbempt, 2008) who already emphasize that product-service transition is a rather incremental process.

What is particularly intriguing related to this finding from a business model research perspective is the fact that a series of incremental changes to the business model can result in innovative business models, which are considerably different from business models common in an industry. On the one hand, this insight is interesting as it is somewhat counterintuitive. Business model literature (e.g. Bucherer et al., 2012; Schneider and Spieth, 2013) clearly distinguishes between business model innovation that is radical in nature and leads to new-to-the-market business models and business model change that is characterized by slight adjustments or improvements. However, extant literature does by now not discuss the possibility to implement substantial changes in the long run. The findings of this thesis show that although the change process involves stepwise, incremental changes to the extant business model on a firm-level, the final outcome of the process leads to a business model that can be classified as a radical business model innovation on a market- or industry-level (see Bucherer et al. (2012) for a detailed categorization of business model innovations with respect to the degree of innovativeness). On the other hand, the results of this thesis show that radical business model innovation and a quick implementation of a novel, service-related business model is not suitable for all types of firms. Instead, firms make use of the opportunity of a stepwise, integrative approach to change their whole way of doing business slowly toward an increased focus on service. In contrast to this insight, literature usually suggests implementing innovative business models parallel to the extant business model in order to benefit from cross-subsidization (Bohnsack et al., 2014). Thus, the findings of the processual analysis conducted in this thesis provide a new insight that enhances extant business model literature.

This insight is not only relevant for academic research, but also interesting for managerial practice. It emphasizes that managers not only have to identify a suitable business model to support their service strategy, but they also need to decide how to approach the business model change process that usually results from the decision to pursue service-related opportunities. After the necessary changes in the various business model elements are defined, managers need to take into account whether the risks of incremental change (resulting from e.g. market pressure or crises) outweigh the risks of radical changes (e.g. high and uncertain investments, customer acceptance).

A second insight that is uncovered by employing a processual approach on business model change in this thesis concerns the nature of the strategic intent that triggers business model change. The empirical findings of this thesis provide evidence that business model change can result from deliberate management actions as well as from an emergent process – an insight

that supports prior thoughts by Demil and Lecocq (2010). However, according to the results of the two processual studies (see subchapters 4.4 and 4.5) that are conducted in the context of this thesis, business model change in the context of product-service transition is often emergent in nature. This is especially relevant in the context of the average market players analyzed in the fifth paper presented in subchapter 4.5, but is also observed in some of the case firms analyzed in the fourth paper (see subchapter 4.4). Interestingly, even firms that deliberately formulate a service-related strategy are not necessarily able to accomplish changes to their business model in a deliberate change management process. This insight is exceptional as it challenges literature (e.g. Amit and Zott, 2012; Cortimiglia et al., 2016) emphasizing that firms make use of business model innovation as a strategic tool in order to improve their competitive position. Translating a new strategy into an appropriate business model is not an easy task as – according to the empirical results of this thesis – firms often lack the ability to deliberately change their business model. Mezger (2014) already highlights that a firm's ability to innovate its business model can be regarded as a dynamic capability. However, the findings of this thesis do not indicate a lack of a firm's capacity to sense and seize business model-related opportunities and reconfigure competences and resources accordingly – the dynamic capabilities necessary for business model innovation (Mezger, 2014). Rather, the long-established manufacturing firms that are analyzed in this thesis often do not employ a business model perspective at all. In other words, they fail to "think in terms of the business model". Thus, this thesis contributes to business model innovation literature that by now underemphasizes the challenges firms face when dealing with the need to change their business models. Against the background of this insight it becomes clear that many decision makers lack the knowledge how to design a business model so that it fits the formulated strategy. Additionally, the findings of this thesis point out that firms often fail to manage the change process involved in this context. In this context, it needs to be highlighted that suggestions on how to manage the change process provided by organizational change literature may not be applicable. Business model change processes are more complex than any other change process that comes along with strategic change as it not only affects firm-internal routines and processes, but also concerns activities that span the boundaries of the focal firm.

(3) The third research objective of this thesis aims at a better understanding of antecedents of and barriers to business model change in the context of product-service transition. With respect to this research objective, findings that result from the analysis of business model characteristics and configurations need to be distinguished from findings that result from the

processual studies employed in this thesis. The first point to factors that influence the choice of a particular business model manufacturing firms employ in order to benefit from new, service-related strategies, while the latter highlight aspects that affect the business model change process itself. Thereby, this thesis contributes to product-service transition literature as it uncovers under which conditions a specific business model is suitable to support product-service transition. Additionally, these findings are especially relevant in the context of business model innovation literature as they shed further light on by now undiscovered mechanisms that drive the process of business model change.

Regarding factors that affect the choice of a particular business model design this thesis points to three main aspects: firm-internal capabilities, bargaining power of the focal firm, and network position of the focal firm. These findings mainly result from the empirical findings of the third paper of this thesis (see subchapter 4.3), but they are also in line with the theory-based assumptions about manufacturing firm business models in the context of product-service transition of the first and the second paper (as presented in subchapters 4.1 and 4.2). In doing so, this thesis highlights that not all potential business model configurations identified in the context of product-service transition are suitable for all manufacturing firms in their pursuit of service-related opportunities. First, to decide which business model is suitable for a particular manufacturing firm, decision makers need to consider firm-internal capabilities. This includes both, capabilities necessary to create and deliver specific services offerings as well as relational capabilities that facilitate the integration of customers and other network partners. While prior research examined different types of capabilities (e.g. Karpen et al., 2012; Möller and Törrönen, 2003; Salonen, 2011; Ulaga and Reinartz, 2011) in the context of product-service transition, their influence on a manufacturing firm's business model design choice has not been previously discussed. Next, bargaining power is identified as an additional antecedent of a manufacturing firm's business model design choice – a finding that supports the reasoning by Zott and Amit (2008). This aspect is related to the third factor that also influences a firm's business model design choice: a firm's network position. Especially lock-in-centered and novelty-centered business model designs require a central network position of the focal firm. Thus, by linking business models and network aspects this thesis provides empirical evidence for theoretical assumptions regarding so-called network architects promoted by researchers in the realm of service-dominant logic (Lusch et al., 2007; Lusch et al., 2010). Furthermore it enhances the findings by Frankenberger, Weiblen, and Gassmann (2013) who already point to different network configurations manufacturing firms need to consider when pursuing product-service transition.

The detailed analysis of business model change processes conducted in the context of this thesis allows for uncovering reasons why not all manufacturing firms achieve to change their business model so that it is fully in line with a new service strategy. Although the analysis of manufacturing firm business models employed in the third paper (see subchapter 4.3) reveals such a misfit, only the processual perspective of the last two papers (see subchapters 4.4 and 4.5) helps to better understand the underlying mechanisms that hinder manufacturing firms from designing and implementing adequate new business models. A particular barrier to business model change is that manufacturing firms often lack a network perspective. When dealing with product-service transition challenges, they often focus on how to organize firm-level activities. This impedes holistic, system-level changes that are necessary to implement a new business model. This inside-out perspective leads to two aspects that hamper business model change. First, because of this firm-internal focus, firms fail to recognize business models that would allow them to pursue service-related opportunities. In this context, the empirical findings of this thesis provide clear evidence that path dependence plays a crucial role in business model change processes – an aspect that, has not been explicitly addressed in business model literature although some researchers (e.g. DaSilva and Trkman, 2014; George and Bock, 2011) highlight the need to do so. A second result of this inside-out perspective is that manufacturing firms cannot benefit from resources of their network partners and develop new capabilities with the help of their network partners. These resources and capabilities are, however, often necessary to seize service-related opportunities. The analysis of performance effects of product-service transition goes beyond the objective of this thesis. Nevertheless, the barriers that hamper business model change that are identified in the two processual studies of this thesis (see subchapters 4.4 and 4.5) are a starting point to better understand the inconclusive findings regarding performance effects of manufacturing firms' service-related strategies (Ulaga and Reinartz, 2011). Even if firms are able to recognize new service-related opportunities and formulate adequate strategies, their extant business model may not allow them to benefit from these opportunities.

Additionally, the market position and the resource endowment of a firm have a substantial influence on how a business model change process looks like. In this context, the thesis also challenges the assumption that business model innovation can be achieved by restructuring existing resources (Amit and Zott, 2012). Due to the high costs and considerable risks that come along with business model innovation, firms often refrain from innovating their business models and only implement essential adjustments. Moreover, some firms perceive business model innovation not as an opportunity, but changes to the business model are rather

seen as essential in order to ensure firm survival. Thus, this thesis supports the viewpoint promoted by Bucherer et al. (2012) who argue that business model change can also be threat-driven. Thus, by considering a "dark side" (Demil et al., 2015: 9) of business model change this thesis (see especially subchapter 4.5, but also subchapter 4.4) sheds light on when a particular business model change is appropriate and efficient for established firms.

Regarding management implications, these insights point to the special role firm interactions with the business ecosystem play in the context of a manufacturing firm's pursuit of service-related strategies. The findings of this thesis show that manufacturing firms can proactively pursue service-related opportunities by formulating strategies with a particular strong dedication to service. However, to benefit from these strategies severe changes to the business model are necessary that require a particular openness toward the firm's business ecosystem. Changing the business model based on existing strengths of the firm or on already available resources and capabilities is usually not sufficient to seize extraordinary service-related opportunities. Instead, managers need to take their business ecosystem into account and aim at compensating a lack of firm-internal resources or capabilities by making use of network partners' strengths. To do so, managers need to integrate business activities performed by network partners into the business model. Furthermore, the chosen business model design needs to allow for an implementation of processes that enable the firm to continuously gather and exploit information from the business ecosystem into the business model. This particularly calls for changes to the business model structure, but also affects all other business model elements. Moreover, it is important to understand that even managers that are satisfied with their current position need to think about business model change. As a firm's market position and resource constraints limit the potential of business model change, firms need to look ahead and anticipate necessary changes in advance. Especially firms with an average market position and low resource endowment are not able to quickly accomplish radical changes to their business model. Therefore, incremental changes over time may be essential to avoid severe crises.

Additionally, the fact that external triggers and external resources are important in business model change processes also provides an interesting new perspective for business consultants. The question how to design creative and visionary business models in order to foster a firm's competitive position is frequently addressed by business consultants. However, the issue of how to implement new business models and how to deal with barriers of business model change is often underemphasized. As the dominant business logic of a firm acts as a blinder

(Prahalad, 2004), manufacturing firms are usually not able to recognize service-related opportunities or fail to realize them on a business model level. This is where consulting agencies can step in. They could assist manufacturing firms to overcome obstacles such as a firm's too narrow focus on extant capabilities or immediate network partners that hinder the implementation of new business models.

5.2 Limitations and Outlook

This thesis is, as is the case for any research, subject to limitations. As a first aspect, it has to be acknowledged that this thesis does not comprise a quantitative-empirical study aiming at testing theory. Some researchers would regard this fact as a limitation. However, the qualitative research approach employed is an appropriate step to tackle the research objectives of this thesis. Three reasons led to this decision: first, while Demil et al. (2015) emphasize the necessity to advance theory building in the context of business model research, Ostrom et al. (2015) highlight the identification of business models as a research priority in the realm of product-service transition research. Both issues call for a qualitative research approach as a better understanding of the involved constructs and their interrelations needs to be developed before potential hypotheses can be tested in quantitative studies. Second, quantitative research does not allow for a direct analysis of decision making processes that play a role in the context of business model change. In order to clearly understand how firms manage to change their business models, research needs to uncover the deeply embedded processes and shed light on the underlying mechanisms that influence business model-related decisions and their consequences – which can be achieved by employing qualitative research methods. Third, when conducting quantitative-empirical research related to business models and business model innovation, researchers often make use of items borrowed from other research areas (e.g. Osiyevskyy and Dewald, 2015) in order to measure the effects of business model choices or of business model innovation. Alternatively, they develop measurements rather intuitively (e.g. Cortimiglia et al., 2016). The applicability of such intuitive measurements can also be regarded as a severe limitation. By now, there is still a lack of measurements that are based on a thorough scale development process. However, scale development goes beyond the objectives and the scope of this thesis.

Another limitation is linked to the sample of case firms that is analyzed in the three empirical papers (see subchapters 4.3, 4.4., and 4.5) of this thesis. All firms analyzed in this thesis have

their headquarters in central Europe – although some of these firms operate on an international basis. This was necessary as the qualitative research approach employed in this thesis required personal meetings with firm representatives. As funding of this thesis' research project is limited, a European setting was favorable to keep traveling expenses low. However, focusing on European firms is also justifiable from a methodological point of view as such a specific analysis limits extraneous variation and thus sharpens external validity of the findings (Eisenhardt, 1989). Nevertheless, as a consequence of the sample selection, the findings of this thesis cannot be directly transferred to firms that have a non-European background. However, by selecting European firms for the case sample this thesis blends in with numerous prior studies, which also analyze the phenomenon of product-service transition in the context of European firms (e.g. Antioco et al., 2008; Kowalkowski et al., 2013; Matthyssens and Vandenbempt, 2008). Furthermore, service strategies of manufacturing firms usually play an important role especially in mature industries (Oliva and Kallenberg, 2003; Cusumano et al., 2015). Hence, it is reasonable to assume that firms in other developed countries – for instance in a US setting (as examined e.g. by Fang et al. (2008)) – face similar challenges as the firms under research in this thesis. In contrast firms operating in emerging countries are likely to be affected by service-related challenges in a very different way – an aspect that remains to be examined in future research.

A last limitation of this thesis pertains to the sample of 40 cases that are analyzed within the thesis as large multinational corporations are excluded from observation. Firms in the sample are mostly small and medium-sized firms (according to the European Commission (2003) these firms are characterized by a number of employees < 250, a turnover ≤ 50 million Euro, and a balance sheet total ≤ 43 million Euro). Some firms exceed the definition of small and medium-sized firms as they have more than 250 employees. Nevertheless, none of the case firms analyzed in this thesis have more than 1000 employees. Even the large firms in the sample are characterized by structures and resource endowments that are considerably different from large multinational corporations, but similar to medium-sized firms. The decision to examine only firms with less than 1000 employees is not directly linked to the research objectives of this thesis, but is caused by the sampling approach (for details see the methodology chapter of each empirical research paper presented in this thesis). Large multinational corporations behave differently when innovating their business models. In particular, their resource endowment allows them to experiment with different business models or to establish multiple business models at the same time (Bohnsack et al., 2014; Markides and Charitou, 2004). Hence, business model change processes in the context of

product-service transition are also likely to be different in large multinational corporations. Following, the focus on firms smaller than 1000 employees represents a limitation of this study. Nevertheless, only few studies (e.g. Gebauer et al., 2010; Kowalkowski et al., 2013) analyze product-service transition in the context of smaller firms. Business model research also very often focuses either on large, well-established firms or on new ventures with a high degree of entrepreneurial orientation, but rather disregards the domain in between. Hence, focusing on firms smaller than 1000 employees not necessarily represents a limitation. In contrast, by shedding light on business model change processes triggered by product-service transition in small and medium-sized or slightly larger manufacturing firms this thesis contributes to product-service transition research as well as business model innovation research.

The limitations discussed above open up interesting avenues for future research. In particular, further research is necessary that analyzes product-service transition-triggered business model change of manufacturing firms in different geographical regions. Furthermore, it is up to future research to compare business models and the respective business model change process of manufacturing firms with different firm-sizes. This calls for a research approach that allows for analyzing a large-scale sample. The business model specifications as well as the antecedents and barriers to business model change identified in this thesis represent a suitable starting point to develop a conceptual framework that allows such a research design (as for instance demonstrated by Zott and Amit (2007; 2008) in the context of e-businesses and high-tech firms who draw on the business model specifications identified by Amit and Zott (2001)). Much more interesting are, however, the future research areas that result from the overall results of this thesis.

First, the development of measurements that allow for large-scale quantitative-empirical studies depicts an important future research agenda. Quantitative studies that make use of thoroughly developed measures are necessary to test hypothesis regarding interrelations of different business model configurations and business model innovation with other variables such as firm capabilities, bargaining power, network position, or the market position. According to the findings in this thesis, these variables seem to have considerable influence on how manufacturing firms design and implement new business models. Moreover, adequate measurements that capture business model change are required to analyze performance effects of product-service transition.

Another interesting area of research resulting from this thesis concerns the particular business model configuration that is based on novelty-centered sources of value creation. The findings of this thesis point out that manufacturing firms often employ a particular perspective on their business network in order to benefit from product-service transition. These manufacturing firms are able to assume the role of a so-called network architect. While theoretical considerations regarding network architects are promoted by Lusch et al. (2007) and Lusch et al. (2010), detailed empirical research that backs up their ideas is still missing. This thesis provides first evidence that manufacturing firms can evolve into network architects although they employed a very traditional, product-centric business logic in the past. Moreover, it describes and characterizes business models that allow manufacturing firms to benefit from this role. However, a detailed analysis of the transformation process that manufacturing firms experience when evolving from traditionally product-centric firms to being a network architect was beyond the scope of this thesis. This calls for further processual research that particularly addresses this topic.

Additionally, the results of this thesis point to reasons that explain why manufacturing firms are not able to benefit from product-service transition. First, internal and external misfit of the employed business models can prevent firms to seize service-related opportunities. Second, obstacles hampering the change process, which occurs when new business models are implemented, can lead manufacturing firms to make use of an inappropriate business model configuration. Research still yields inconclusive results regarding performance effects of product-service transition (Ulaga and Reinartz, 2011). The results of this thesis indicate that considering the interplay between business model change and performance effects of product-service transition promises more robust findings as a manufacturing firm's ability to operationalize service-related strategies on a business model level seems to play a major role in this context. Studies in this thesis indicate – in contrast to arguments brought forward by Amit and Zott (2012) – that business model innovation is at least for some types of firms a time-consuming process. Therefore, it is important that future research considers time-lags that delay possible positive performance effects of service-related business models established by manufacturing firms.

Against the background of this thesis, it also becomes apparent that both research streams – product-service transition research as well as business model innovation research – underemphasize the risks that come along with business model change in general or product-service transition-triggered business model change in particular. Thus, strategic risks as well

operational risks need to be analyzed. These types of risks can be measured objectively by analyzing firm-related and market-related key figures. However, especially the fourth and the fifth paper in this thesis (see subchapters 4.4 and 4.5) point to the important role a manager's cognitive representation of the environment plays in the context of business model change. Hence, the individual risk perception of managers also needs to be taken into account.

Furthermore, the peculiarities of the business model change process could be further examined. This thesis already points to aspects that hinder manufacturing firms to manage the business model change process adequately. However, the findings also indicate that business model change processes do not proceed under the same rules as any other organizational change process. Based on the findings of this thesis, it can be argued that the network perspective that is inherent in the business model concept causes these differences. Business model innovation very often not only results in firm-internal changes, but also calls for changes regarding linkages to network partners. A particular openness toward the business ecosystem is a precondition for the implementation innovative, new-to-the market business models. Future research could analyze in more detail how and why business model change processes are different from organizational change in general. It might also be interesting to draw on existing knowledge out of innovation literature in this context. Open innovation processes (i.e. innovation based on network partner collaboration) as well as the so-called open business models that are necessary to facilitate open innovation have already been discussed in literature on open innovation (e.g. Chesbrough and Schwartz, 2007; Frankenberger et al., 2014). However, the question which factors are of relevance in collaborative business model innovation is still unanswered.

Analyzing business model change against the background of different industry settings is also an important area for future research. This thesis focuses on business model change that is triggered by product-service transition. Only the fifth paper presented in this thesis is not restricted to a manufacturing firm setting as it also analyzes business model change of service firms. However, the study provides only first evidence as it shows that business model change processes are not necessarily dependent on the industry in which a firm operates. Therefore, a more detailed analysis of possible similarities and differences of business model change processes in different research settings (e.g. industries, firm types) is crucial in order to better understand the particular challenges different firms face when dealing with the need to innovate their business models.

Finally, business model innovation is a topic that originates from managerial practice. Moreover, results of academic studies on business model change are of high value for practitioners. Thus, the need to better understand how business model innovation can help firms to deal with changing ecosystem conditions legitimates academic research in this context (Schneider and Spieth, 2013). Therefore, researcher should keep on with nurturing the intellectual exchange with practitioners and work together in order to co-create toolkits that help manufacturing firms to overcome the obstacles that this thesis identifies in the context of product-service transition-triggered business model change processes.

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Erklärung

Ich erkläre hiermit, dass ich die vorliegende Arbeit ohne unzulässige Hilfe Dritter und ohne Benutzung anderer als der angegebenen Hilfsmittel angefertigt habe; die aus fremden Quellen wörtlich oder inhaltlich übernommenen Stellen habe ich kenntlich gemacht, bei Verwendung eigener Vorarbeiten (Veröffentlichungen und Qualifikationsarbeiten) habe ich auf diese hingewiesen.

Die für diese Dissertation ausgewählten Papiere sind teilweise in Co-Autorenschaft mit anderen Autoren entstanden (siehe Fußnoten zu den entsprechenden Kapiteln). Weitere Personen waren an der geistigen Herstellung der vorliegenden Arbeit nicht beteiligt. Insbesondere habe ich nicht die Hilfe eines Promotionsberaters in Anspruch genommen. Dritte haben von mir weder unmittelbar noch mittelbar geldwerte Leistungen für Arbeiten erhalten, die im Zusammenhang mit dem Inhalt der vorgelegten Dissertation stehen. Die Arbeit wurde bisher weder im Inland noch im Ausland in gleicher oder ähnlicher Form einer anderen Prüfungsbehörde als Dissertation vorgelegt.

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