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Change of Business Models and the Role of the Business Ecosystem

Creating Flexibility in Business Models by Companies
in High-Technology Industries

DOCTORAL THESIS

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Graz, December 2014

AFFIDAVIT

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Abstract

Companies today face volatile environments, short product life cycles, and constantly changing customer requirements, which is especially the case in high-technology environments. In such environments, concentrating only on technological and product innovations is not sufficient to gain a competitive advantage. Instead, companies need to have an innovative business model in order to stand out from their competitors. This is one reason why research on business models and their further development is gaining interest in practice and research alike. But research is still at an early stage and requires further clarification. To successfully change business models, companies require the appropriate competencies, which is one research focus of the thesis. In addition, companies interact increasingly with their environment, either when sourcing resources externally, when exchanging information or when co-creating value with customers. As a result, external actors in the business ecosystem are integrated into the business model of the company. Research so far predominantly treats the business ecosystem as a trigger for change, but this research investigates the roles that business ecosystem participants can take in the changeability of the business model. Thus, the objectives of this research are to identify how companies can prepare their business model to counteract environmental changes flexibly and to clarify the roles of the business ecosystem in the changeability of the business model.

With the aid of the chosen exploratory, qualitative research design, the thesis investigates companies operating in high-technology branches. These companies are already well established and face the situation of changing the business model, becoming more open, and working together with external companies. For the design of the semi-structured expert interview guideline, the literature on business model and business model change as well as on business ecosystems was investigated. In total, 20 companies participated in this study and 20 interviews were conducted with CEOs, vice-presidents, product managers or other managers responsible for development of the business model. All interviews were transcribed and analyzed based on the grounded theory and qualitative content analysis. Besides the 20 expert interviews, several discussions were conducted with an expert working as a consultant in the electronics industry as well as with one additional company that was not part of the sample.

The research revealed that companies can prepare the business model and its elements ex ante through the development of capabilities in order to raise the flexibility of the business model. These capabilities have to be developed with regard to several internal and external issues driving these changes. It is further shown that changes in the business model should not be treated in isolation because changes in one element have further consequences for the rest of the business model. The results also show that the roles of the business ecosystem in the change of the business model differ in their intensity and importance for the company, including opening up new business opportunities or providing resources and information. This also leads to different forms of changes in the business model. The findings permit formulation of transferable recommendations for practitioners and researchers in the field of business model change and decisions on the integration and involvement of the business ecosystem.

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Abbreviations

BE	Business Ecosystem
BM	Business Model
BMD	Business Model Development
BMI	Business Model Innovation
BMR	Business Model Reconfiguration
CC	Continuous Change Prozess
CEO	Chief Executive Officer
CRM	Customer Relationship Management
DC	Discontinuous Change Process
EU	European Union
FMEA	Failure Mode and Error Analysis
HQ	Headquarters
IC	Incremental Changes
ICT	Information and Communication Technology
KPI	Key Performance Indicator
M&A	Mergers and Acquisitions
NACE	Nomenclature statistique des activités économiques dans la Communauté européenne

NAICS	North American Industrial Classification System
n.a.	not available
OEM	Original Equipment Manufacturer
RC	Radical Changes
RQ	Research Question
R&D	Research and Development
SME	Small and Medium Sized Enterprise

Part I

Research Intent and Underlying Theory

Chapter 1

Introduction

As the introduction to the thesis, section 1.1 defines the initial situation and the research problem. Then section 1.2 explains the research objectives and research questions for the thesis. Section 1.3 describes the chosen research structure, before section 1.4 finally outlines the structure of this research work.

1.1 Initial Situation and Presentation of the Problem

Companies operate in an environment determined by a fast pace, volatility and uncertainty. To survive, they increasingly have to find new ways to gain a competitive advantage. A study by the The Economist Intelligence Unit (2005) revealed that 55% of the CEOs interviewed find new business models to be a greater source of innovation than new products or services. The reason for the rising interest in new business models was explained through the availability of too many choices of products and services on the market and the lack of differentiation between them. Innovative business models are therefore seen as a way for companies to differentiate themselves from global competitors. Companies like Dell, offering direct sales of self-assembled computers by the customer (Gassmann et al., 2013, p. 7) or IKEA, where customers take the furniture from stock and also build it themselves (Gassmann et al., 2013, p. 222), are just two examples of companies that have revolutionized industry with an innovative business model.

In general, *“a business model describes the rationale of how an organization creates, delivers, and captures value”* (Osterwalder and Pigneur, 2010, p. 14). The emergence of the business model concept is mainly perceived with the appearance of the new economy and e-commerce between 1998 and 2002. Afterwards, the concept was also increasingly adopted in the “old economy” and developed to become a strategic component. Several threats and opportunities lead companies to rethink their business model. (Wirtz, 2011a, p. 7pp) Such developments

include

- new technological possibilities in the new economy in the sharing and distribution of information (Voelpel et al., 2003, p. 4pp; Schuh et al., 2005, p. 9p),
- people's mobility (Voelpel et al., 2003, p. 6p),
- the development of customers to become co-creators (Voelpel et al., 2003, p. 6p; Hearn and Pace, 2006, p. 56pp; Romero and Molina, 2009, p. 403),
- deconstruction of the value chain into smaller segments (Schweizer, 2005, p. 38p; Capgemini Consulting, 2010, p. 12p) and
- the complexity of co-opetition as a result of coalescing cooperation and competition (Hearn and Pace, 2006, p. 56pp).

These trends reformulate traditional business structures and render existing business models obsolete (Voelpel et al., 2003, p. 4pp). Consequently, research and discussions on changing the business model have gained more attention, mainly explained as *business model innovation*.

Especially high-technology companies¹ operating in branches like the electronics or pharmaceutical industry operate in such a rapidly developing environment that is shaped by uncertainty in the market and technology, high risks, and intensive competition (Evans, 1991, p. 69; Brad, 2007, p. 18). The environmental developments stress the fact that businesses are part of a *business ecosystem*, which skips traditional thinking within industry boundaries; companies gain a competitive advantage from cooperative and co-evolving participants in the network, for example suppliers or customers. A proper understanding of the environment and the definition of how to contribute are imperative. Companies that ignore the environment and ongoing developments run the risk of making no profit. (Moore, 1996, p. 3pp)

High-technology companies are characterized by a high level of innovativeness, intensive research and development (R&D) expenditure and a fast pace in terms of obsolescence of products and technologies (Zakrzewska-Bielawska, 2010, p. 94). As conditions in these branches frequently change, flexibility is required in order to redefine strategies continuously and find new ways of gaining a competitive advantage (Evans, 1991, p. 69p). Flexibility is also necessary in the business model in order to be able to respond to new requirements as quickly as possible. The study by KPMG International (2006, p. 4p) postulates the need to develop a *flexible and profitable business model* by reviewing it on a regular basis, developing a unique value proposition, and working together with partners to pursue new opportunities or strengthen the company's position in the value chain. According to Grant Thornton (2010, p. 14), the cost structure is the main focus of change activities in the business model, but there are other aspects as well. However, KPMG International (2006, p. 12p) found that the focus is changing from the cost structure to the value proposition because the commoditization of offerings requires a unique value offered to customers to ensure the growth of the company. Besides

¹The exact definition of companies counting as high-technology is provided in section 6.3.2

the need for flexibility, Schuh et al. (2005, p. 9p) explain that it is difficult to plan one's own flexibility in dynamic markets with the capacities available. Thus, there is a need to look beyond the company's own boundaries in order to increase flexibility within the company.

Collaboration with other companies in the business ecosystem provides several advantages for companies. As strategic possibilities are not limited to the availability of internal resources, strategic flexibility is thus increased. The problem of too high fixed costs is mitigated because it is not necessary to invest in every competence that can also be sourced externally. Instead, companies can concentrate on their core competencies, and the cost of investments can be reduced. This also increases the scope for new business opportunities and makes a successful reaction possible in volatile markets. Furthermore, local cooperation raises the survival rate of companies and strengthens the focus on premier achievements within a company as a result of globalization. (Schuh et al., 2005, p. 9p) To gain an advantage from this collaboration, companies need to develop a kind of *intelligent business model* providing a behavioral repertoire balanced between too big and too small. Companies with low flexibility can increase their flexibility with capacities and competencies from outside, and too much flexibility can be mitigated by concentrating on core competencies. (Knecht and Friedli, 2002, p. 27p; Schuh et al., 2005, p. 12) In doing so, the organization's flexibility has to cope with changes in the environment and thus, needs to be as high as possible changes there (Knecht and Friedli, 2002, p. 28).

Based on the initial situation presented, companies in high-technology branches in particular require a flexible business model to adapt accordingly to changing requirements. The business ecosystem plays an important role here because collaboration can reduce costs and provides a means of realizing business opportunities together as well as enabling companies to concentrate on core competencies. This in turn requires an appropriate business model in order to realize these possibilities. The rising interest in the business model and in business model change concepts led to various definitions of concepts. There are a few definitions available, which have already been established, but a clear definition is still lacking. (Wirtz, 2011b, p. 9) The structure of the business model in terms of elements varies also between the different researchers². The same can be observed in the literature on business model change concepts. Mainly subsumed under the term *business model innovation*, changes are described in the form of a *process* changing the business model or the *degree and scope* of changes, where researchers discuss "how much" of the business model needs to be changed in order to be able to talk about business model innovation. Schneider and Spieth (2013b, p. 15)³ as well as Saebi (2014, p. 9pp)⁴ made a first attempt to structure some of the existing concepts, but an overall

²For example, Osterwalder and Pigneur (2010) describe the business model with the help of nine, and Johnson et al. (2008) with the help of four interlocking elements.

³Schneider and Spieth (2013b, p. 15) divided the current concepts into two research streams: *Business model development*, where the existing business model is adjusted in terms of incremental innovation, and *business model innovation*, where a new one is developed to exploit external opportunities.

⁴Saebi (2014, p. 9pp) compared the three concepts business model evolution, business model adaptation

classification and distinction of all concepts is still lacking. A change in the business model is usually described as a unique event and explains the implementation of an innovative business model or the adjustment of the existing one. Due to the interrelation of business model elements, a change in one element also evokes changes in the other elements. These cause-and-effect relationships have already been explained in the literature (e.g. Hedman and Kalling (2003, p. 53), Zollenkop (2006, p. 47)) as well as different “starting points” when changing the business model (Globocnik, 2012, p. 25), but there is no description of how elements influence each other directly and indirectly due to such changes. Also, research on how to prepare the business model for flexibility is very sparse. Mason and Mouzas (2012, p. 1361pp) describe the flexibility in business models through adaptability in network architecture, market integration, coordination, and business relationships in order to gain better business performance. Taking the airline industry as an example, Nair et al. (2011, p. 3) explain the necessity of a *flexibility and adaptability layer* in the business model to enable constant “*analyzing, benchmarking, acquiring and strengthening*” of necessary competencies for maintaining business performance. They especially highlight the importance of developing and maintaining core competencies (e.g. brand maintenance, product diversification or incremental innovation) to provide flexibility in the business model, which can be established and detected by the cyclic flexibility layer. Several research studies already explain the capabilities necessary for changing the business model⁵, with the focus on describing these capabilities in general, without an explicit description of what is required for changing single elements or defining under which circumstances they are needed. Schneider and Spieth (2013b, p. 21p) also emphasized that more research is required in defining capabilities to innovate the business model, depending on the particular element and type of business model innovation, and the need to *develop these capabilities ex ante*. This correlates with the accomplishments of Schuh et al. (2005, p. 9p), postulating the need for an intelligent business model having the capability of being as flexible as needed. Based on this, further research is needed in the classification of the business model concept and in the description of *enablers*, which should be established in the business model and its elements *ex ante* in order to prepare it for changing conditions.

Establishment of capabilities that enable flexibility depends on internal and external environmental developments. The business ecosystem especially demands business model changes, not only by triggering those changes⁶, but also by integrating its actors into the business model (Palo and Tähtinen, 2011, p. 380pp). With the concept of an *open business model* introduced by Chesbrough (2006, p. 2p), external partners are incorporated into idea generation and value

and business model innovation according to the expected outcome, degree and scope of change as well as frequency and novelty of changes.

⁵Capabilities necessary for changing the business model are, for example, a suitable organizational environment (Voelpel et al., 2003, p. 21), market sensing and learning (Matthyssens et al., 2006, p. 759), the importance of the manager responsible for monitoring risks and uncertainties as well as consequences for all elements in the business model (Demil and Lecocq, 2010, p. 241) or dynamic capabilities required therefor (Dottore, 2009; Mezger, 2013).

⁶For example, the economic crisis (Almeida et al., 2009, p. 29), technological discontinuities/developments or shifts in customer needs (Hamel and Välikangas, 2003, p. 53; Teece, 2010, p. 187p)

creation “by using a key asset, resource, or position not only in the company’s own business, but also in other companies’ businesses”. Also *networked business models* (Palo and Tähtinen, 2011, p. 378pp) follow this idea of opening the boundaries and integrate external sources for value creation and value capture. In a networked business model, the business net is part of the business model of a single firm⁷ by integrating inter-relationships with partners into elements of the business model (Palo and Tähtinen, 2011, p. 380pp). In their study, they identified a link between the company’s business model and the business model of participants in the network and highlighted the importance of adjusting the business model to any changes in the environment. Nielsen and Nontemari (2012, p. 142pp) explain the role of human resources in performance of the business model and also the fact that humans in a network enable dynamics in the business model. This addresses the role of humans in the value creation process, but the role of single people or companies in the changeability of the business model is not addressed. In the literature, the role of the customer in co-creating value is discussed especially (e.g. Conte (2008)), but other business ecosystem actors are not mentioned in that regard. The discussions include the necessity of business ecosystem participants in value creation and capture as well as triggering changes in the business model, but also the interrelationship between the business model of the company and business ecosystem participants, despite the fact that discussions about the effects of these participants on the business model and its elements, and especially the roles these actors can take in the changeability of the business model, are lacking. However, due to the fact that the focal company and participants in the business ecosystem are interrelated, they co-evolve and influence each other (Moore, 1993, p. 76). In this respect, it is assumed that participants in the business ecosystem play an important part in value creation, and companies have to develop business models that enable cooperative working.

1.2 Research Objectives and Research Questions

Based on the initial situation and the research problem presented, this dissertation has the goal to describe first of all how a business model can be prepared or designed in order to be flexible with respect to different triggering factors. Second, it should reveal which role the business ecosystem plays in the changeability of the business model and how single elements and the business model as a whole are influenced. For this research, it seems appropriate to conduct investigations in companies operating in high-technology branches as the context for the empirical study due to the challenges these companies face, as explained in the previous section. Thus, two main research questions, including sub-research questions, can be formulated:

⁷Palo and Tähtinen (2011, p. 380pp) explain the actors and their roles and positions, the value system, and relations and dynamics as elements of the business net that are incorporated into the business model.

RQ 1: How should the business model, with its corresponding elements, be designed so as to provide the flexibility required to adapt to changing needs?

- RQ 1.1: Which elements constitute the core elements of the business model?
- RQ 1.2: What characterizes elements that are flexible to respond to changes?
- RQ 1.3: How does change in one element influence the other elements in the business model and subsequently result in a completely different business model?

RQ 2: How is the role of the business ecosystem perceived in regard to the changeability of the business model?

- RQ 2.1: How are single elements of the business model affected by the business ecosystem?
- RQ 2.2: How does the business ecosystem affect the business model as a whole?

Research question 1 has the goal of proposing a business model providing the flexibility needed to adapt to internal and external needs. The *design of the business model* refers to the business model structure and the characteristics of the elements and of the entire business model to provide flexibility, but the research does not intend to describe a process of designing a business model. The sub-research questions formulated should help to answer the research question. First, the core elements of a business model should be identified. This addresses the need postulated by Wirtz (2011b, p. 9) to clarify the definition of the business model. On this basis, the characteristics of business model elements that are able to respond to changes are elaborated; here, characteristics and capabilities necessary for the changeability of the entire business model are considered as well. This addresses the need postulated by Schneider and Spieth (2013b, p. 21p). To provide transparency on the interrelationship of business model elements when changes take place, which is not yet clear, their influence on each other as well as the degree or intensity of change should be highlighted.

Research question 2 uses the business model identified in research question 1 as a basis to identify the roles of the business ecosystem and its participants, respectively, in the changeability of the business model. In this way, the effect of the business ecosystem on single elements as well as on the business model as a whole should be illustrated. This contributes to the lacking explanation of interrelations between the company's business model and business ecosystem participants, as explained in networked business models (e.g. Palo and Tähtinen (2011, p. 380pp)).

Both research questions should be answered by means of an empirical study. The research design for the empirical study in this dissertation and the reasons for this design are explained

in the next section.

1.3 Research Design

The research on the changeability of business models is still at an early stage, as discussed in the preceding sections. Besides the publication of conceptual papers, there is an increasing number of empirical studies describing changes in companies' business models. The dominating research design in these papers are qualitative studies in the form of case study research (e.g. Aspara et al. (2011), Øiestad and Bugge (2014)) or grounded theory, frequently combined with the case study procedure (e.g. Dmitriev et al. (2013)), as proposed by Eisenhardt (1989). Quantitative studies are still sparse, justified with the lack of clarity in theory development (e.g. Bornemann (2010), Schneider and Spieth (2013a)).

When deciding on the research design, the goal of the research and the research questions asked are crucial. A qualitative research design is suitable if the research interest is to understand *meanings* of situations or events participants are involved in, *events and actions* in a specific context, unanticipated phenomena or influences, the underlying process of actions taken or causal explanations (Maxwell, 2005, p. 22p). In addition, the formulation of *What*, *How* or *Which* questions is another indication of a qualitative research design. In such research studies, the researcher shows the importance of a phenomenon and the research gap identified in the theory postulates a broad formulation of research questions. (Creswell, 2003, p. 106; Eisenhardt and Graebner, 2007, p. 26; Yin, 2009, p. 28).

The exploratory qualitative research design chosen in this dissertation relies on the former criteria described. The goal is to identify roles and actions taken in a specific context and situation as well as causal relationships between these actions. Furthermore, open and broad research questions were formulated arising out of the emerging literature on business model change and the lack of established concepts in this field. In qualitative research, it is further common to add specific sub-questions to a broadly formulated research question (Creswell, 2003, p. 105), which is also the case in this research. Moreover, all research questions formulated are *What*, *How* or *Which* questions.

In order to answer the research questions, the method of expert interviews was selected and conducted in the form of *semi-structured interviews*. These interviews were analyzed by applying the *content analysis* proposed by Mayring (2000) and the methodology proposed by Gioia et al. (2012) based on the grounded theory. The detailed description of the overall research process and reasons for choosing these methodologies is explained in detail in chapter 6.

1.4 Structure and Content of the Thesis

The thesis is structured in four different parts and ten chapters, as illustrated in figure 1. *Chapter 1* describes the initial situation, the research problem and research objectives. Based on the research questions stated, section 1.3 explains the research design chosen and the methodologies used. In *chapter 2*, the basic theory of the thesis is introduced. The systems theory is chosen as underlying theory, as it seemed appropriate in understanding business models and their elements as well as business ecosystems and their interrelations. In addition, the meaning of flexibility in this thesis in relation to systems thinking is explained.

Part 2 has the goal of explaining the main theoretical concepts of the thesis. *Chapter 3* starts with an explanation of the business ecosystem and highlights definitions, characteristics and theories on which the business ecosystem relies. Furthermore, participants in the business ecosystem and the roles and strategies participants can incorporate are explained. In addition, different kinds of relationships between participants are explained and the implications of following a business ecosystem strategy are presented. *Chapter 4* explicates the historical development of the business model concept and presents several definitions of the concept. To develop an ex-post understanding of the business model and its elements, existing definitions in the literature are investigated. Interconnections between business model elements and the development of the business model at different levels are highlighted as well. The focus of *chapter 5* lies on the changeability of the business model. At the beginning, different factors driving business model changes are presented and several concepts explaining the scope and degree of business model changes are outlined and compared. Which capabilities are necessary is therefore explained at the end of chapter 4.

Part three deals with the empirical study and the results obtained in order to answer the research questions. At the beginning, *chapter 6* explains the research process in detail and outlines the methods chosen for data collection and analysis. Besides this, preliminary theoretical considerations for the empirical study are described based on the theoretical concepts explained in part two. *Chapter 7* aims at answering research question 1. First, the core elements identified for the business model are presented. After this, different internal and external factors evoking a need for flexibility are described. Further, possibilities for business model changes and the consequences for the elements in the business model are explained. At the end of this chapter, flexibility potentials necessary to cover the flexibility needs are presented. The chapter concludes with an overall answer to research question 1. In order to answer research question 2, *chapter 8* explains the roles identified in the business ecosystem in business model changeability. Based on these roles, the business ecosystem incorporates different forms of business model changeability in single elements and the business model as a whole is described. Finally, an overview of all roles and their influence on the business model is provided.

Part four summarizes and discusses the results and provides an outlook for further research.

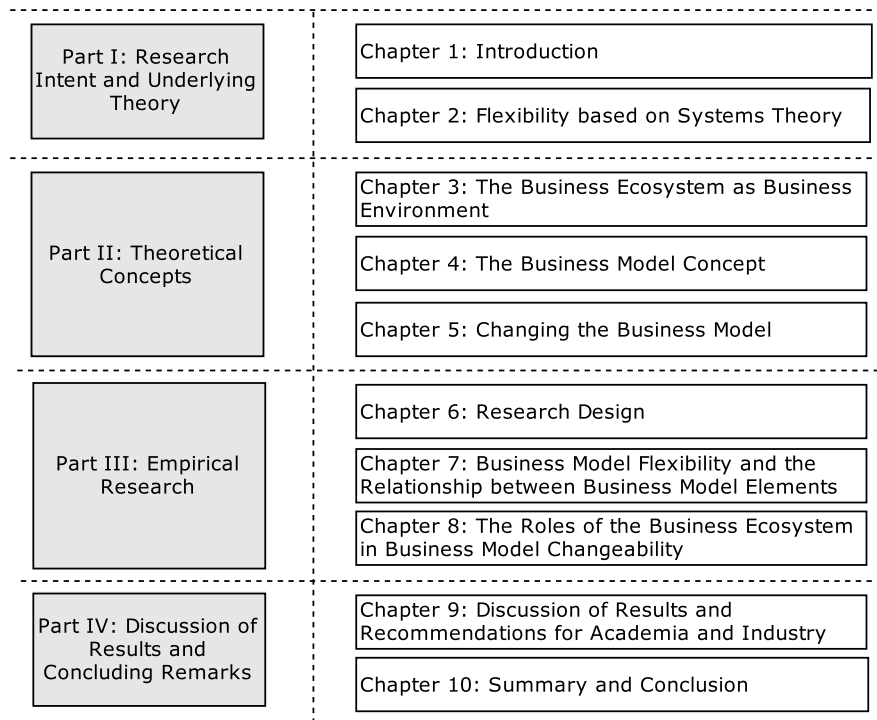


Figure 1: Structure of the dissertation (own illustration)

Chapter 9 provides a critical discussion and reflection on the results of chapters 7 and 8 with the theoretical concepts explained in part 2, as well as information gained through discussing the empirical results with additional companies and experts. In doing so, recommendations are provided for practitioners. *Chapter 10* summarizes the main results and presents possible limitations of the thesis.

In the *appendix* to this thesis, important information is provided on data collection and data analysis in the form of paraphrased interviews and references to the original position in the interviews.

The documentation and representation of results use primarily figures and tables. In chapters 7 and 8, case vignettes to explain the empirical results are also employed by referring directly to the empirical data. The case vignettes are based on paraphrased and consolidated data from the interviews. Additionally, direct quotations are used in chapter 9 to emphasize the results by providing statements taken from the interviews and discussions with experts.

Chapter 2

Flexibility based on Systems Theory

The aim of this chapter is to develop a common understanding of flexibility and define it for the purposes of the present thesis, based on systems theory as the chosen underlying theory of the thesis.

Systems theory or systems thinking is suitable if it is important to investigate *cause and effect relationships* of a complex nature. The relationships between elements need to be considered in order to explore certain behavior. (Horstmann, 2005, p. 30p) Golinelli et al. (2002, p. 65p) further highlight that an advantage of the systemic approach is the possibility of showing the “*evolutionary dynamics of a firm*”. Both the business model and the business ecosystem can be considered from a systemic perspective. The business ecosystem consists of organizations and individuals related to one another. This interconnectedness leads to a *co-evolution* of participants when changes occur in the business ecosystem⁸ (e.g. Moore (1996) or Iansiti and Levien (2004b)). A business model can be explained in the form of different elements and of the relationship between these elements⁹ (e.g. Osterwalder and Pigneur (2010)). As the aim of viable entities is to survive, the company has to develop alongside the environment by improving the business model or the competitive position towards value generation (Golinelli et al., 2002, p. 66). Thus, business models are dynamic and change over time, they are complex¹⁰ and due to the fact that they are models of a company, they can be seen as open and social systems¹¹ (Halecker and Hartmann, 2013, p. 3). The characteristics of the business ecosystem and the business model, as well as the relationships between them and their influence in terms of changes indicate the appropriateness of systems theory for the further research.

⁸See chapter 3 for a detailed explanation of the business ecosystem

⁹See chapter 4 for a detailed explanation of the business model

¹⁰A system is complex because its behavior cannot be determined at specific points in time. (Ulrich and Probst, 1988, p. 58pp; Horstmann, 2005; Wolf, 2012, p. 166p)

¹¹A system is open if the system and its environment interact with each other and are interdependent. A system is social because a company is developed by and consists of human beings. (Wolf, 2012, p. 166)

An understanding of flexibility for the rest of the thesis is provided in the subsequent sections. The concept of flexibility has been discussed frequently for several years, with the result that different definitions exist. For this reason, a broad overview of flexibility and the different understandings of this concept is provided first of all. Due to the systemic view taken in this thesis, the realization of flexibility in systems is discussed afterwards. Finally, a working definition of flexibility for this thesis is provided.

2.1 Different Understandings of Flexibility

In the literature, discussions about flexibility take place in specific managerial situations and problems. This is the reason for the diverse landscape in the understanding of flexibility. Eppink (1978, p. 10), for example, says that “*flexibility can be seen as a characteristic of an organization that makes it less vulnerable for or puts it in a better position to respond successfully to unforeseen environmental change.*” In his understanding, he highlights the *passive and active notion* of flexibility, where the passive one describes the possibility of weakening environmental impacts and the active one describes the capacity of the organization to respond. Two moments when flexibility actions are taken are explained by Evans (1991, p. 74) – the proactive notion as *ex ante flexibility*, which exists before a need for flexibility appears, and *ex post flexibility* as the reactive one. This understanding correlates with the active and passive understanding of Eppink (1978, p. 10). Volberda (1996, p. 360pp) describes flexibility in the context of *hyper-competition* and the necessity for *adaptive capabilities*¹², where companies need to respond *ex post* to changes rather than predict them in advance. He therefore defines flexibility as the “*degree to which an organization has a variety of managerial capabilities and the speed at which they can be activated, in order to increase the control capacity of management and improve the controllability of the organization*” (Volberda, 1996, p. 361). In this context, managerial capabilities¹³ are capabilities that have to be developed and promoted in order to be prepared for unexpected disturbances. Flexibility is also a function of management control capabilities¹⁴ and the changeability of the organization¹⁵. In addition, Volberda (1997, p. 170) emphasizes the challenge for companies to balance stability and change; this issue is discussed further in section 2.3.

Existing definitions tend to highlight flexibility as an *ability/capacity* (Krijnen, 1979, p. 64; Aaker and Macarenhas, 1984, p. 74; Das and Elango, 1995, p. 63) or *capability* (Evans,

¹²Volberda (1996, p. 360) describes how companies need to identify and develop new competitive advantages continuously in hyper-competition. Thus, adaptive capabilities are needed.

¹³These capabilities encompass variety (e.g. number of capabilities, quality of capabilities) and speed, where flexibility is seen as a dynamic process (Volberda, 1996, p. 361).

¹⁴Managerial tasks, like manufacturing flexibility, innovation flexibility (Volberda, 1997, p. 170).

¹⁵Organization design tasks, which ensure that the company has the conditions for flexibility; e.g. manufacturing flexibility needs the right technology in the form of multipurpose machinery or a huge operational repertoire of production (Volberda, 1997, p. 172).

1991, p. 69; Bahrami, 1992, p. 34; Genus, 1995, p. 288; Voigt and Wildemann, 2007, p. 126) that a company incorporates in order to *change* in a proactive manner or *react* to certain circumstances. Golden and Powell (2000, p. 376) explain the difference: Flexibility as “*capacity to adapt*” supports the thinking of flexibility in several dimensions. Capacity can be defined as “*the power of containing, receiving, experiencing or producing*”; in comparison, capability is defined as “*the power to do something*”. These understandings or explanations only have a meaning when put in a specific context provided by areas or dimensions where flexibility should be achieved. Flexibility as an ability is explained by Krijnen (1979, p. 64) that “*a flexible form has the ability to change itself in such a way that it remains viable.*” He describes three possibilities for change – flexible adaptation to unforeseen environmental circumstances, possible developments in the environment that can be anticipated through planning, and the development of activities where the company actively tries to influence the environment. This explanation also incorporates the active and proactive notion of flexibility, as described earlier. Seeing flexibility as capability, Genus (1995, p. 288) defines it as a “*capability necessary for dynamic environments where continual range is likely to make an approach favoring once-and-for-all adjustment inappropriate*”. Also Bahrami (1992, p. 34) sees flexibility as “*a blend of capabilities and attributes that facilitate adjustments to change*”. Das and Elango (1995, p. 63) take a closer look at strategic flexibility, defining it as “*the ability of an organization to respond to changes in the environment in a timely and appropriate manner with due regard to the competitive forces in the marketplace.*” They further explain the achievement of external¹⁶ and internal¹⁷ flexibility through factors. The definitions provided highlight the complexity and diversity of the flexibility concept, as indicated above. A clear distinction between the definitions is barely possible.

Flexibility is mainly discussed at three different levels. *Operational flexibility* is related to the short term and describes flexibility in the sense of having the ability to change production lines or products quickly. In particular, manufacturing flexibility is discussed in this context. *Tactical flexibility* has a medium-term range and is related to technological aspects, for example changes taking place in the production equipment of the company. *Strategic flexibility* is oriented towards the long term and describes the capability to position the company in the future with reference to several choices available. This can be achieved with new business models, a change in the strategy, the application of new technologies, or with new product-market combinations. Especially over the past few years, strategic flexibility has been discussed frequently because it is considered an important element in gaining a competitive advantage. (Carlsson, 1989, p. 186p; De Toni and Tonchia, 2005, p. 525; Haasis and Juechter, 2007, p. 60)

¹⁶E.g. suppliers, alliances and multinational operations (Das and Elango, 1995, p. 63).

¹⁷E.g. manufacturing flexibility, modular product design, employee flexibility and organizational structure (Das and Elango, 1995, p. 63).

2.2 Concepts Related to Flexibility

Flexibility is a “*polymorphous concept*” consisting of several attributes and capabilities required in order to be flexible in specific situations (Bahrami and Evans, 2005, p. 19). This means that the attributes and capabilities required differ depending on the situation when flexibility is required. Thus, a company needs to have all the capabilities and attributes in order to address the right one when needed. Bahrami and Evans (2005, p. 19) describe this as *super-flexibility*. This super-flexibility is established by other concepts, which are closely related to flexibility and often used interchangeably. Table 1 provides an overview of these related concepts.

Concepts	Explanations
Adaptability	Accommodating a transformed environment.
Agility	Moving nimbly into and out of different domains.
Elasticity	Stretching and shrinking to meet different perturbations or pressures.
Hedging	Mitigating against the losses associated with the “downside” potential.
Liquidity	Transforming from one form to another without substantial switching costs.
Malleability	Molding into unorthodox conditions. Pliable or able to bend in order to meet unusual circumstances.
Mobility	Re-deployable assets and capabilities.
Modularity	Re-configurable blocks or units allowing upgradeability when something new comes along, or extensibility when demand is high.
Robustness	Taking hits with minimal damage to functional capability.
Resilience	Bouncing back from the brink after sustaining damage, or degrading gracefully before termination.
Versatility	Functioning with dexterity in different settings.

Table 1: Concepts related to flexibility (Bahrami and Evans, 2005, p. 15)

Adaptability overlaps widely with flexibility; these terms are frequently used interchangeably, but there is a distinction between the two. Adaptability describes the adjustment to new conditions of a transformed environment. This adjustment can be a singular or permanent activity. In comparison, flexibility is a “*successive, but temporary, approximation to the best case state*”. In strategic management, it is used to explain a company’s abilities to adapt to changes that are foreseen or planned. (Evans, 1991, p. 73; Bahrami and Evans, 2005, p. 16) Evans (1991, p. 73) stated that *re-adaptation* is more similar to flexibility. It is seen as a process describing the interaction taking place between the organization and its environment. In doing so, the company can shape the environment and respond to unexpected changes (Genus, 1995, p. 288p).

Agility and *versatility* are also concepts closely related to flexibility. *Agility* is “the extent to which an entity can move nimbly backwards, forwards, and sideways with dexterity” to gain an advantage or to escape from an undesirable situation. In the literature, agility is explained as an enlargement of flexibility, incorporating speed and flexibility. Because of the huge overlap of topics between flexibility and agility, a new term called *flexagility* was introduced (Wadhwa and Rao, 2003, p. 111). *Versatility* can be achieved in two ways: by implementing capabilities which permit a response to different scenarios ahead of time; or, if the changed situation is already present, capabilities which permit fast modification. (Evans, 1991, p. 74; Golden and Powell, 2000, p. 379; Bahrami and Evans, 2005, p. 16f)

Resilience is “the ability of a system to absorb disturbance and still retain its basic function and structure” (Walker and Salt, 2006, S. 1). The resilience concept is basically used to describe the capability of an ecosystem to regenerate after a shock or disruption. In the business context, resilience describes the ability to recover from a shock or any kind of damage. For companies, it is important to bounce back from such shocks or damage. (Bahrami and Evans, 2005, p. 17). Another concept related to flexibility and resilience is *robustness*. It is used to explain how companies can withstand shocks in environments where obstacles can hit them. In this sense, robustness refers to the ability of a system to “absorb, deflect or endure” the impacts of unanticipated changes. It is about persistent turbulence without any damage. (Evans, 1991, p. 73; Golden and Powell, 2000, p. 381; Bahrami and Evans, 2005, p. 17)

Further concepts related to flexibility are *elasticity* – stretching and shrinking to meet different situations like perturbations; *hedging* – alleviating losses with the consequence of benefits in uphill potentials; *liquidity* – an asset that can lead to financial flexibility by being converted into another form of wealth with minimal switching costs; *malleability* – taking an unusual form because of unusual circumstances; *mobility* – meaning that assets and capabilities are re-deployable; *modularity* – describing how different units or parts are extensible or upgradeable according to new possibilities or demands; and *slack*, which further developed to the concept of *organizational slack* and describes the buffer available between the organization and environmental discontinuities. (Evans, 1991, p. 73p; Genus, 1995, p. 288p; Bahrami and Evans, 2005, p. 15)

In recent years, concepts like *organizational renewal* and *organizational learning* have gained interest in the context of flexibility. Organizational learning is seen as a process facilitating flexibility in the organization. Its importance for the company is reflected in the installed routines for learning, enabling every individual in the organization to handle uncertainties and strengthen the ability to perceive ways of performing better. Organizational or strategic renewal describes an evolutionary view of strategic development, starting with the current situation and developing over time. (Genus, 1995, p. 288p)

2.3 Considering Flexibility from a Systemic Point of View

The goal of the previous section was to provide a general understanding of the flexibility concept in a business context. In this section, the meaning of flexibility from a systemic point of view will be elaborated.

Flexibility can be considered as a basic characteristic of a system, becoming more important with increasing complexity, uncertainty, and dynamics in the environment. The interaction of internal and external influences on the system requires an interactive process of adjusting the system. This interactive process requires flexibility, but at the same time has to retain stability as well. Thus, flexibility can be seen as a *“capability of a dynamic system to design the relationship between the environment of the system and the system itself through different states of the system, so that the objectives of the system can still be achieved¹⁸”* (Brehm, 2003, p. 42). It is important that flexibility is not just a reactive-adaptive process, but an evolutionary one. (Brehm, 2003, p. 41pp)

The view of flexibility from a systemic perspective does not change its meaning, but enlarges it. De Toni and Tonchia (2005, p. 526) highlight the flexibility of a system from a general point of view by describing it in three ways: as *“characteristic of the interface between a system and its environment”*, where flexibility absorbs uncertainty; as a *“degree of homeostatic control and dynamic efficiency of a system”*, where flexibility is seen as the degree of cybernetic definition; as well as the *“capability of adaptation/change”*. Pibernik (2001, p. 12) describes flexibility as the *“capability of an open, dynamic, socio-technical system to react purposefully to relevant system or environmentally induced changes with existing (flexibility) potentials¹⁹”* (Wolff, 2005, p. 12). In comparison, Hocke and Heinzl (2006, p. 5) explain flexibility as *“the capability of a socio-technical system to adjust purposefully on the basis of its scope of action to relevant system-internal and environmental changes, which can be either risks or opportunities²⁰.”* Explaining flexibility in systems as a *“property of a system that can be changed easily”* (Ferguson et al., 2007, p. 3), with the focus on designing a system for flexibility, is elaborated by Fricke and Schulz (2005) and Ferguson et al. (2007). The sources of flexibility lie within the system (Brehm, 2003, p. 45p; Wolff, 2005, p. 12), and it is important to distinguish between flexibility of elements in the system, the flexibility of the structure in the form of the relationships between the elements, and the flexibility of the entire system. Wolff (2005, p. 12) further describes *“purposefulness, dynamics, the existence of degrees of freedoms, and both the internal and external orientation²¹”²²* at the same time as the characteristics of flexibility and systems.

¹⁸Translated by the author.

¹⁹Translated by the author.

²⁰Translated by the author.

²¹An open vs. self-referential system, as well as market and resource orientation of flexibility (Wolff, 2005, p. 12).

²²Translated by the author.

In order to understand the flexibility of a system, possible locations of flexibility in the system need to be identified. One source of flexibility in systems is *variety*. Variety describes the different states a system can have. It needs to be distinguished in variety of the environment and variety of the system; the variety of the environment (flexibility need) has to be as large as the variety of the system (flexibility potential). Variety can be seen as a *precondition* for flexibility and increases with the dynamics and complexity of environmental changes. Besides variety, Horstmann (2005, p. 34p) and Brehm (2003, p. 214p) describe further important sources of and prerequisites for flexibility in systems: *Organizational slack* designates the surplus of possibilities for selection. *Modularization* refers to structural prerequisites, which form the connection to internal relationships through *loose coupling* or external relationships through *network coordination*; modularization enables single elements of the system to absorb changes independently of the entire system. Some of the complexity that needs to be handled lies in the modules or single elements and is *self-regulated* there. To cope with environmental changes and enable equilibrium of the system, it needs to further develop and foster learning. This requires an *organizational learning process*. Horstmann (2005, p. 34p) describes these sources as *criteria of a system*, which are necessary for flexibility.

Based on the previous definitions, the necessity to develop sources for flexibility within the organization *ex-ante* is emphasized in relation to internally and externally induced needs. The system is thus flexible if it contains alternatives for action in an objective and temporal manner. Figure 2 illustrates these explanations in the form of *flexibility needs* and *flexibility potentials*, where the flexibility potentials are necessary to cover flexibility needs. The alignment of flexibility needs and potentials is designated as the task of flexibility management, also known in the literature as flexibility planning or flexibility policies (Brehm, 2003, p. 88; Horstmann, 2005, p. 52pp; Hocke and Heinzl, 2006, p. 5p; Haasis and Juechter, 2007, p. 60; Singer, 2012, p. 79) The goal is to achieve system equilibrium by balancing flexibility needs and flexibility potentials (Haasis and Juechter, 2007, p. 60).

Flexibility needs have their origins in the environment or inside the system. External needs are determined by the relationship between the system and its environment. Internal system needs can relate to system elements or relations between the elements. The resulting impact of the change may be relevant or irrelevant to the system. Flexibility needs are further determined by two factors: the environmental complexity²³ and dynamics. Drivers of complexity are, for example, globalization, the convergence of branches, or the complexity of products due to higher competitive intensity or higher customer demands. In comparison, drivers of environmental dynamics are the increasing velocity of change (e.g. higher innovation rates, new technologies, shorter product life cycles) and the frequency of occurrence. The rising intensity of change is determined, for example, by fluctuations in demands or political decisions. Discontinuous changes are also important, but need to be distinguished from shocks. Discontinuities completely

²³The complexity refers to the number and diversity of the system elements considered as well as the number and diversity of its relationships (Horstmann, 2005, p. 52pp).

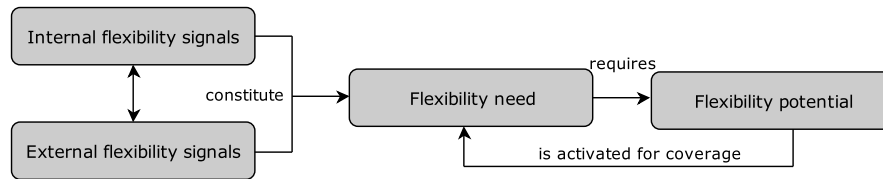


Figure 2: Relationship between a flexibility need and flexibility potential (referring to Brehm, 2003, p. 88; translated by the author).

change the direction of the company, whereas shocks temporarily change the state, with the goal of bouncing back to the original state. (Horstmann, 2005, p. 52pp; Hocke and Heinzl, 2006, p. 6pp) The flexibility need is high if the environmental dynamics are high and frequent, and if they are complex and the predictability of environmental developments is unclear. This implies that the more unstable and unpredictable information about the environment is, the greater the importance of flexibility and with it, the importance of the flexibility potential. (Brehm, 2003, p. 90p)

The *flexibility potential* describes the basis for establishing possible actions that make a system flexible. It is based upon different possibilities that can be chosen and is seen as the adjustment to flexibility needs. Thus, a system is flexible if it has more possibilities because it can then choose; the system needs to have some slack. (Brehm, 2003, p. 214p) Flexibility potentials cannot be operationalized independently of flexibility needs because flexibility potentials are used to cover them. They can be determined for the entire system or every single element of the system, which implies a hierarchical nature. (Hocke and Heinzl, 2006, p. 6pp) Hocke and Heinzl (2006, p. 9pp) distinguish between the *passive defense* and the *active coverage* of disturbances. Activities for disturbance defense reduce or block changes. This can be in the form of shielding the system through *slacks*. This is a simple action, but very sophisticated and rigid. The second possibility is the selection of inputs that are absorbed. These inputs are ignored, rejected or forwarded through active decisions. The prerequisites for flexibility introduced by Horstmann (2005, p. 34p) and Brehm (2003, p. 214p), as explained earlier, are important for flexibility potentials.

The degree of flexibility in the system consists of the number of different conditions of the system and the time needed to reach the condition. In the literature, the characterization of flexibility can be determined by three dimensions: The scope of actions, the capacity to act, and the speed of actions. The *scope of actions* describes the number of different conditions of the system. The *capacity to act* comprises different scopes of action that can be used when needed. Also, the willingness to act, which means the willingness of the system and its elements to recognize a change and to support the flexibility measures needed, are part of the capacity to act. The *speed of actions* is the time needed to identify relevant changes, actions taken, and unfolding of actions. An example of the scope of action is acting in an international market. Thus, such capacities as knowing the foreign language for communication

are necessary. Possibilities for action can be increased through characteristics of the system elements. Due to an increase in dynamics, the *speed of actions* gains importance as well; without the necessary speed, the scope and capacity of activities are useless. (Horstmann, 2005, p. 77p; Kulenovic, 2010, p. 4p)

In the literature, the paradox of stability and flexibility is also discussed. Normally, the system will be in a state between stability and chaos; both are not ideal states of the system in their pure forms, but they are not opposites; they are both requirements of the system. The opposite of stability is *instability* and causes the collapse of the system. Stability should secure equilibrium in the system, including adaptation to internal and external triggers. To facilitate stability, flexibility potentials are required to be able to react to flexibility needs. Therefore, stability can rather be seen as *adaptation* in the form of a state and flexibility as a process of *adjustment or modification*; this means that stability can be equated to adaptation and flexibility to adjustment. Alignment of both is discussed in the literature and described as a “position in the middle”, better known as *the edge of chaos*. Companies seeking change should push this position as it fosters creativity, innovation, change and learning. Brown and Eisenhardt (1998, p. 11p) describe how organizations evolving strategies at the edge of chaos are most effective and most flexible; a balance between stability and flexibility should help to achieve a dynamic equilibrium. (Brehm, 2003, p. 43p; Haasis and Juechter, 2007, p. 60; Umbeck, 2009, 99p) Volberda (1996, p. 365) further describes that the balance between the development of dynamic capabilities, which raise the flexibility, and a suitable organizational design, which uses the flexibility, is imperative in solving the paradox of flexibility. This renders actions for flexibility useful and purposeful.

According to systems theory as the basic theory of this thesis for explaining how flexibility can be incorporated into the business model, the following working definition based on the previous explanations should guide and clarify the meaning of flexibility for the rest of the thesis:

Flexibility is the *ability* of the business model and its single elements *to adapt to changes or exploit opportunities* in the future. Flexibility is determined by the *need for flexibility* as well as the *potential for flexibility*. The need for flexibility is created by internal and external factors triggering a change in the business model. The potential for flexibility is the ability of the business model and its single elements to cover the flexibility need. This ability is characterized through *capabilities or properties* inherent in business model elements or the business model as a whole.

Part II

Theoretical Concepts

Chapter 3

The Business Ecosystem as Business Environment

The business ecosystem provides a framework to explain how companies influence each other, which role they can play in the business ecosystem, and what implication this has for the company. This chapter first explains the business ecosystem concept in terms of existing definitions, underlying theories, and characteristics in more detail. Section 3.3 describes roles that participants of a business ecosystem can incorporate as well as relationships that can exist between business ecosystem participants.

3.1 The Business Ecosystem Concept: Definitions, Theories and Characteristics

The term *business ecosystem* was introduced for the first time by Moore (1993; 1996). Moore (1993, p. 76) suggests that companies have to stop thinking in industries and should start thinking in *business ecosystems* because the understanding of competition, established in terms of market and competitors, is not suitable anymore. According to Moore (1996, p. 26), a business ecosystem is “*an economic community supported by a foundation of interacting organizations and individuals – the organisms of the business world*”, where innovative ideas are the focal interest. Within this community, value creation for the customer has high priority, while the customers are also participants in the business ecosystem. Besides Moore, Iansiti and Levien (2004b, p. 22p) are also important figures in the development of business ecosystem thinking. They explained that “*business ecosystems are formed by large, loosely connected networks of entities*”. For Iansiti and Levien (2004b, p. 8p), the main focus of a business ecosystem lies in the *relationship* between participants as well as their dependence on each other for economic success and survival. Moore (2005, p. 32p) further states that the business

ecosystem has the task of coordinating different contributions that are largely complementary in nature. Companies recognized that they are not alone in the world of business and existing complementary innovations are also required for customer benefits. To fulfill a customer need, several different contributors may be required. Most of the time, a single firm does not have the specialized knowledge resources of the whole system, so these complementary advances are needed. Iansiti and Levien (2004b, p. 22p) further extended the business ecosystem concept by describing different *roles* participants can play, which are explained in more detail in section 3.3.

3.1.1 Definitions of the Business Ecosystem

Besides Moore, Iansiti and Levien as the originators of business ecosystem thinking, several other definitions emerged that are closely related. Table 2 provides an overview of business ecosystem (BE) definitions in the literature.

Author	Business Ecosystem Definition	View of the Business Ecosystem
Moore (1993, p. 76)	<i>"In a business ecosystem, companies co-evolve capabilities around a new innovation: they work cooperatively and competitively to support new products, satisfy customer needs, and eventually incorporate the next round of innovations."</i>	Community
Moore (1996, p. 26)	<i>"An economic community supported by a foundation of interacting organizations and individuals – the organisms of the business world. The economic community produces goods and services of value to the customers, who are themselves members of the ecosystem. The member organisms also include suppliers, lead producers, competitors and other stakeholders. Over time, they co-evolve their capabilities and roles, tend to align themselves with the directions by one or more central companies."</i>	Community
Iansiti and Levien (2004b)	<i>"Basically, a business ecosystem is a business network. Business ecosystems are formed by large, loosely connected networks of entities that interact with each other in complex ways, and the health and performance of a firm is dependent on the health and performance of the whole."</i>	Network
Peltoniemi and Vuori (2004, p. 279)	<i>"[...] we consider a business ecosystem to be a dynamic structure which consists of an interconnected population of organizations. These organizations can be small firms, large corporations, universities, research centers, public sector organizations, and other parties which influence the system."</i>	Population
Quaadgras (2005, p. 1)	A business ecosystem is <i>"a set of complex products and services made by multiple firms in which no firm is dominant."</i>	Network

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Author	Business Ecosystem Definition	View of the Business Ecosystem
Dourmas and Nikitakos (2009, p. 2)	<i>"Business ecosystems span a variety of industries. The companies within them co-evolve capabilities around innovation and work cooperatively and competitively to support new products, satisfy customer needs and incorporate the next round of innovation. To a certain extent, an ecosystem also includes direct and indirect competitors that, as circumstances shift, may also be collaborators."</i>	Network
Li (2009, p. 380)	<i>"A business ecosystem is an emerging concept analogized from biology. Business ecosystems move beyond market positioning and industrial structure by having three major characteristics: symbiosis, platform, and co-evolution."</i>	Network
Mäkinen and Dedehayir (2012, p. 1)	<i>"The business ecosystem describes the network of firms, which collectively produce a holistic, integrated technological system that creates value for customers."</i>	Network
Thomas and Autio (2012, p. 2)	They define a business ecosystem as <i>"a network of interconnected organizations, organized around a focal firm or a platform and incorporating both production and use side participants."</i>	Network
Zahra and Nambisan (2012, p. 220)	<i>"A business ecosystem is a group of companies – and other entities including individuals, too, perhaps – that interacts and shares a set of dependencies as it produces the goods, technologies, and services customers need."</i>	Community
Mäkinen and Dedehayir (2014, p. 100)	They see a business ecosystem as <i>"a network of sub-industries that specialize in producing the interdependent technical sub-systems of a hierarchically structured technological system."</i>	Network

Table 2: Business ecosystem definitions

What was observed from the definitions listed in table 2 is the dominant view of the business ecosystem as a *network*, working collectively towards the same goal. Moore (1993) sees the business ecosystem as an economic *community* with a large number of loosely interconnected participants. Peltoniemi and Vuori (2004) compare the business ecosystem to a *population* of organizations consisting of different participants. In addition to these views, Iansiti and Levien (2004b, p. 148p) and Dourmas and Nikitakos (2009, p. 8p) take a *platform view* of the BE, where efficient and effective work is provided with the help of a software platform. The platform architecture should draw the boundaries between companies, their technologies and their products and is also seen as the central role in the ecosystem that helps others to develop their products. (Rong et al., 2010, p. 2175) Instead of using the term business ecosystem, Hearn and Pace (2006, p. 56pp) use *value ecology* to describe the idea behind the concept. Like Anggraeni et al. (2007, p. 11pp), they see the business ecosystem as a *metaphor* for network thinking, where relationships are dynamic; value generation does not concern the product alone, and both cooperative as well as competitive relationships are present. Business

ecosystems are also seen as a metaphor for describing business relationships, including supply chains, value chains and networks.

The *cooperative and competitive* interactions as well as the *co-evolution*, which is one step further, are important aspects in the business ecosystem because not only partners bringing complementary products work together, but also competitors play a part (Peltoniemi, 2005, p. 58). In a co- evolution, cooperative and competitive participants shape the future of the business ecosystem together (see also section 3.3.2). (Rong et al., 2010, p. 2175) For companies, it is important to enlarge the view of strategic management from core products and services to *co-evolving ecosystems*. This requires them to overcome traditional innovation thinking. Companies create innovative benefits for their customers in communities. The boundaries of the company as well as participating in one industry only are ways of thinking and acting that are no longer sustainable and do not lead to a competitive advantage. (Moore, 1993, p. 76; Moore, 1996, p. 12pp; Iansiti and Levien, 2004b, p. 39p) Moore (1993, p. 76) states that business ecosystems are not settled in one industry. Instead, they span a variety of industries, where companies co-evolve their capabilities around innovation and work in cooperation and competitively in the development of new products. These new ecosystems require leaders that are able to work across traditional organizational and cultural lines with the goal of defining a vision that goes beyond a single company, industry, and national borders. The strategic management center should shift from just managing itself to leading a community of partners. This also requires the development of an advanced business model for these communities. Thus, the sources of a competitive advantage lie in establishing and protecting one's own position in such an ecosystem.

Business ecosystems evolve around so-called *opportunity environments*, where there are unfulfilled customer needs, unharnessed technologies, promising investors and so on. In these opportunity environments, new strategies are developed to seize opportunities and viable networks are created together with other business ecosystems. (Moore, 1993, p. 76; Moore, 1996, p. 12pp) As in a biological ecosystem, the exact boundaries of a business ecosystem are very often hard to define due to the interaction taking place between participating companies. Instead of defining a static boundary, the degree of interaction between the different companies should be estimated²⁴. The ecosystem should, therefore, be characterized by the level and type of interaction (e.g. market relationships, technology sharing). Iansiti and Levien (2004b, p. 39p) describe business ecosystems as *loosely interconnected members* who are dependent on one another.

The *interconnectedness* plays a major role in business ecosystems. History shows that interconnectedness is not new to BE thinking, but has evolved over time and was established in computing and communication technologies (Iansiti and Levien, 2004b, p. 18p). The inter-

²⁴Examples are tools and technological components which are shared, or interactions between suppliers and buyers (Iansiti and Levien, 2004b, p. 39).

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connectedness of the players bonds them together and leads to dependence of health and performance on others as well as on the health and performance of the whole ecosystem. Thus, the fate of every single member is bound to the fate of the whole ecosystem, where every single member contributes to the health of the whole ecosystem. (Iansiti and Levien, 2004b, p. 19pp) According to Iansiti and Levien (2004a, p. 72p) the health of a business ecosystem can be determined by three factors: *productivity, robustness, and niche creation*, and every factor comprises different measures. For example, the *productivity* of the business ecosystem can be measured by such factors as the return on invested capital, how productivity changes over time, or the innovation affinity in the ecosystem. These measures can be used further to compare different business ecosystems or ecosystem domains, respectively.

The computing branch is characterized by high interaction. Firms specialize in different niches, and single products are the result of the collective effort of different firms. This interconnectedness also exceeds company boundaries in order to connect all firms involved. In the computing ecosystem, different industries like the software industry or hardware industry form different sub-industries that produce their products independently. However, the present interconnection between those sub-industries can be considered as the business ecosystem. (Iansiti and Levien, 2004b, p. 22pp; Mäkinen and Dedehayir, 2014, p. 100)

In order to provide a better understanding of these complex business ecosystems, Iansiti and Levien (2004b, p. 43) suggested subdividing the ecosystem into *business domains*. These business domains contain groups of companies engaged in related business activities, sometimes representing traditional industries. A BE can comprise several domains, which can be shared with other ecosystems. These business domains are also described as *sub-industries* (Mäkinen and Dedehayir, 2014, p. 100) or *cluster of networks* (Hearn and Pace, 2006, p. 59), which are interrelated and shape the BE. Iansiti and Levien (2004a, p. 71) further emphasize the importance of healthy domains because a weak domain can influence and weaken the whole ecosystem. The burst of the Internet bubble made it clear that companies in such an ecosystem share the same fate, and that they rise and fall together.

Moore (2005, p. 73) also sees the BE as a *new organizational form* between markets and hierarchies. Markets are responsible for the transfer of goods; hierarchies are responsible for controlling activities producing goods. The focus of a business ecosystem is the coordination of innovations in goods, of the activities producing the goods, as well as the “*managed co-evolution of the complex web of markets and hierarchies themselves.*” The difference between markets, hierarchies and BE is the required relationships as well as the level of analysis to determine performance. A more detailed view of relationships between markets and hierarchies is provided in section 3.3.2.

3.1.2 Different Business Ecosystem Analogies

With the transfer of ecosystem thinking into the business context, further concepts appeared which are closely related to business ecosystems and are sometimes used as synonyms.

Innovation ecosystems are described by Adner (2006, p. 98) and Thomas and Autio (2012, p. 18p) and represent collaborative developments where companies combine their offerings to provide a complete solution for the customer. Especially companies in high-technology branches (e.g. Intel or Nokia) follow a strategy of this kind. Innovation ecosystems enable the creation of value that could not be created by a single firm alone. Innovation and external benefits are the main sources of value; complementarity and innovation are rationales for partner symbiosis. The locus of coordination is based on the company level. *Technology ecosystems* have the same sources of value as innovation ecosystems, but with the distinction that the locus of coordination is running on a platform (Thomas and Autio, 2012, p. 18p).

The *economy as an ecosystem* was explained by Rothschild (1995), who defines every economy as a system consisting of organisms and the relationships between them. In this system, the organisms represent nodes in this network, for example in the form of suppliers, competitors or customers. The connections are the relationships between those organisms. As time passes, changes happen within the system as some nodes disappear and new ones appear. In this process, the relationships between the organisms are also subject to changes. Here, Rothschild (1995) compares companies as organisms within the system and industries as species. (Peltoniemi and Vuori, 2004, p. 270p)

Additional ecosystem analogies are *industrial ecosystems*, *digital business ecosystems* or *social ecosystems*. Industrial ecosystems have the goal of enabling sustainable development in industrial operations in the form of waste reduction and minimum as well as efficient use of virgin material. (Frosch and Gallopoulos, 1989, p. 144pp; Peltoniemi and Vuori, 2004, p. 270; Korhonen and Snäkin, 2005, p. 170) Digital business ecosystems are defined as “*decentralized peer-to-peer networks*” forming an underlying tier of agents distributed in a multi-agent system. An example of such a digital BE was developed in an EU-funded project with the goal that software written by SMEs operates as organisms in an ecosystem. The species in such a system can be software components, for example, applications, or services. Social ecosystems co-evolve with organizations, meaning that the focus is on organizations and not individuals. A social ecosystem consists of businesses, consumers, suppliers or other institutions, and it influences organizations as well as being influenced by them. (Peltoniemi and Vuori, 2004, p. 271p) Dourmas and Nikitakos (2009, p. 11) see the economy as a system and as a social ecosystem most closely related to the business ecosystem.

3.1.3 Underlying Theories and Characteristics of Business Ecosystems

Gueguen et al. (2006, p. 3) describe how the business ecosystem is based on established theoretical concepts, such as biological ecosystems (Moore, 1996, p. 25), business networks (Goethlich and Wenzek, 2004, p. 11), complexity theory (Peltoniemi and Vuori, 2004, p. 268) or resilience (Goethlich and Wenzek, 2004, p. 11). Nonetheless, it has its own characteristics and can be distinguished from these concepts. The following sections explain their meaning for business ecosystems in more detail as well as highlighting specific characteristics of the business ecosystem.

3.1.3.1 Business Ecosystems as Biological Ecosystems

Biological ecosystems are used to explain a business ecosystem. Moore (1996, p. 25p) used aspects of biological ecosystems and transferred the notions and vocabulary to the definition of business ecosystems; lansiti and Levien (2004b) did the same. A biological ecosystem can be described as a *“biological community that occurs in some locale, and the physical and chemical factors that make up its non-living or abiotic environment”* (University of Michigan, 2008). Taking a systemic view, Peltoniemi and Vuori (2004, p. 268) explain a biological ecosystem as being *“a system of organisms occupying a habitat, together with those aspects of the physical environment with which they interact”*. In total, a biological ecosystem can be described as a *system* consisting of individuals, populations and communities and the way in which they operate as a whole. In such a system, functional aspects (e.g. materials flow, rate of nutrients recycling), and not every single species, are in the foreground. Furthermore, ecosystems are seen as evolving systems with a dynamic nature, facing constant regeneration, reactions to natural disturbances and competition among species. The stability of the ecosystem is affected by the existing diversity of species, where at least some of them should be able to cope with the changing situation. (Peltoniemi and Vuori, 2004, p. 269) Using the biological ecosystem as a metaphor is helpful for managers to better understand business relationships within and between industries (Anggraeni et al., 2007, p. 4). Nevertheless, there are differences between a biological ecosystem and a business ecosystem – innovation, competition between members, and intelligent actors. *Innovations* are important for companies and less so for biological ecosystems because they aspire to stability and durability; aspects like the imperative to grow and fulfill new functions do not exist. In addition, business communities are social systems composed of *intelligent, real actors*, who are able to plan and make decisions; powerful imaginations are shared with the focus to envision the future. Besides this, there is also *competition between members*. (Moore, 1996, p. 18; lansiti and Levien, 2004b, p. 35pp)

The concept of *resilience* is closely related to biological systems. As already explained in section 2.2, resilience deals with challenges of system perturbations and their ability to absorb change while retaining the same function and structure (e.g. Holling (1973), Walker et al. (2004) or

Gunderson (2000)). Business ecosystems refer to resilience, but also to *resistance*, representing the basis of stability. Resistance describes the ability to ward off external disturbances from the community. Resilience on the other hand explains how successful and fast the business ecosystem is in returning to the initial situation after an exogenous shock. Resistance follows the thinking of keeping competitors out of the market and defeating them. Resilience follows the strategy that companies build networks and therefore allow a greater diversity of companies within the market, building the basis of business ecosystems. This fosters recovery from an external shock and the establishment of a keystone strategy. (Goethlich and Wenzek, 2004, p. 8)

3.1.3.2 Business Ecosystems as Business Networks

A network can be described in the form of nodes related by threads. *Nodes* can be represented by a person, teams, business units or organizations. *Threads* or *ties* represent the relationship between them because companies do not exist as islands and do not stand on their own. Threads and nodes have a specific content in the form of resources, knowledge or different understandings. (Håkansson and Ford, 2002, p. 133; Borgatti, 2003, p. 992) When talking about networks in the business environment, *business network* is the term mainly used. Holmlund and Törnroos (1997, p. 304) describe a business network as a “*set of connected actors that perform different types of business activities in interaction with each other*”. To understand a network, actors, activities and resources need to be described and the influence on each other’s needs must be known. Actors can be single participants, groups of individuals or whole companies that are part of the network representation. Also, a center of the network can exist in the form of a company; if it is a *self-organizing system*, a leader is not necessarily required. In general, activities are performed by actors; actors further control resources, which are transformed by activities and used by actors to fulfill a goal. Through resources, actors achieve power and activities are enabled. To delineate actors and resources, the relationships between actors need to be understood. (Ritter and Gemünden, 2003, p. 693). In addition, interactions between actors in the network, the power single actors have, as well as the environment of the network can be represented. The network boundaries are defined by the amount and the nature of these relationships and their influence. (Henneberg et al., 2006, p. 417pp)

As illustrated in table 2, most of the definitions see a business ecosystem as a business network, whereas Lansiti and Levien (2004b) emphasize that it is a *metaphor* for business networks. Anggraeni et al. (2007, p. 11) explain the difference in the perspective used for analyzing relationships between members and their environment, different roles participants can possess, as well as mechanisms for guiding interactions and the common goal. Thus, the business ecosystem should be used to understand business networks and should not be seen as a new organizational form, although Moore (2005, p. 73) describes it in this way. This research does not intend to describe the business ecosystem as a new organizational form; instead, it treats

it as a metaphor for a business network where different participants are interrelated through relationships.

The difference between business ecosystems and other existing network structures and collaboration concepts is not clearly defined. Concepts like hub-and-satellite networks, clan-like networks and Keiretsus²⁵, clusters, value networks, triple helix²⁶ or virtual networks are established and clearly defined. (Goethlich and Wenzek, 2004, p. 11; Majava et al., 2013, p. 26pp) Although these concepts have unique characteristics, they are still related. Thomas and Autio (2012, p. 2) explain the difference between a business ecosystem and other networks in the integration of both the customer as well as the supplier side. Thus, the focal company depicts the center of the considerations, like a central hub or platform. This is a real distinction towards other concepts in the network theory. Clusters or industry networks focus more on the production or supplier side of the company, whereas strategic networks or value networks focus on the customer or user side (Rose, 1994, p. 18). Table 3 shows the difference between clusters and value networks compared to business ecosystems.

	Cluster	Value network	Business ecosystem
Geography	Geographic concentration	Anything from local to global	Rejects the role of geography
Competition and cooperation	Fierce rivalry	Cooperation	Both simultaneously
Industry	Firms represent the same industry	Different industries complement each other	Finds the term industry obsolete
Knowledge	Rivalry limits the willingness to share	Limited to operative information	Interconnectedness as the enabler and shared fate as the motivator of cooperation
Control	Members fairly independent	One powerful actor	Decentralized decision making

Table 3: Comparison of the key features of clusters, value networks and business ecosystems (Peltoniemi, 2005, p. 62)

Looking at geographic differences, clusters concentrate around local or regional interests (Porter, 2000, p. 16), whereas these geographical restrictions are not present in value networks or business ecosystems. Value networks can have a global, but also local presence, and in business ecosystems the geographical aspect is completely rejected. Competition and cooperation are both present in business ecosystems. In clusters, there is a fierce rivalry (Porter, 2000, p. 21), and value networks are based on cooperative structures, where each member has specific tasks to fulfill; usually they do not compete with each other (Lehto

²⁵Is a network organization consisting of participants having the same purpose and willingness to cooperate; dominant in Japanese industry (Majava et al., 2013, p. 27).

²⁶Consisting of academia, industry and government. They have constant interaction, foster new innovations or create new organizations (e.g. as incubators) (Majava et al., 2013, p. 27).

et al., 2013, p. 3). Clusters are normally built around the same industry (Porter, 2000, p. 16), whereas value networks incorporate different industries that complement each other. In business ecosystems, the term industry is replaced by the term business ecosystem because the industry thinking is not seen as important. Knowledge creation and transfer also differ between these concepts. As clusters are based on rivalry, the willingness to share knowledge is limited. In a value network, knowledge sharing is limited primarily to operative information. However, the interconnectedness in business ecosystems promotes a high level of knowledge sharing and transfer. The interdependence between the members of a cluster does not require control. In comparison, a value network consists of participants that are different in size and power, and the smaller ones rely on the more powerful ones. In business ecosystems, control is decentralized and also large companies, acting as keystones, do not have huge power. (Peltoniemi, 2005, p. 61p)

3.1.3.3 Business Ecosystems as Complex Systems

A business network can be described as a “*complex self-organizing system*” (Wilkinson and Young, 2002, p. 126; Ritter et al., 2004, p. 177), which also applies to business ecosystems. The complexity theory is used here as a theoretical background for explanations (Peltoniemi and Vuori, 2004, p. 268pp; Gundlach, 2006, p. 19pp), where concepts like “*self-organization, co-evolution, emergence and adaptation*” are present. *Self-organization* describes an ongoing process of the emergence of novel structures without intervention from the inside or outside. The self-organizing process establishes itself from the bottom upwards through interactions taking place between the firms involved. There is no single firm that is responsible for managing the whole network. In some situations, firms are more powerful and in others, they are less powerful. (Ritter et al., 2004, p. 177) The performance achieved is the result of simultaneous actions performed by all participants. *Co-evolution* describes the interdependency within the system if something changes. This means that “*interdependent species evolve in an endless reciprocal cycle – changes in species A set the stage for the natural selection of changes in species B and vice versa*” (Moore, 1993, p. 75). The change in one company affects the evolution of other companies. *Adaptation* describes the process where the ecosystem changes to fit the environment. (Peltoniemi and Vuori, 2004, p. 276pp)

3.1.4 Characteristics of Business Ecosystems

The three main characteristics of business ecosystems, *value logic, participant symbiosis and institutional stability*, are summarized by Thomas and Autio (2012, p. 7pp) (see figure 3). These characteristics are interdependent and embody most of the concepts explained beforehand.

The *value logic* is specified by the value co-creation, the sources of value and the value

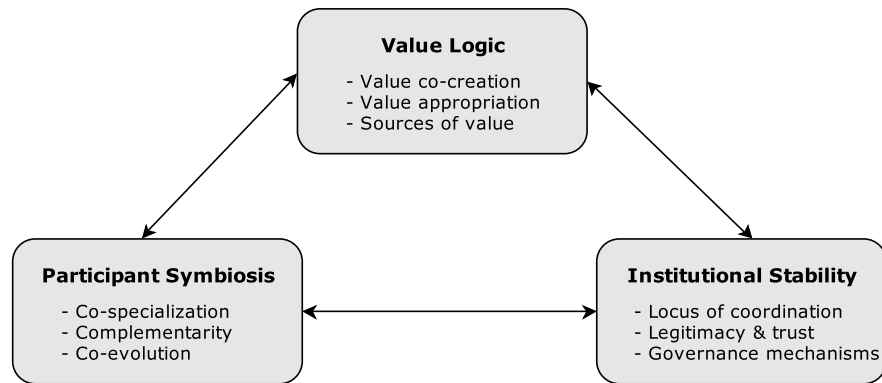


Figure 3: Characteristics of a business ecosystem (referring to Thomas and Autio, 2012, p. 27)

appropriation. *Value co-creation* takes place when different participants in an ecosystem work together to produce value for the customer. In this way, every participant concentrates on its own competencies during the co-creation process. For value co-creation, platforms can be helpful in providing different tools, services, or technologies that can be used by the members of the ecosystem and additionally enhance the performance of the providing company. One example is the Windows operating system, which is used as a basis by other companies in building their own software. The platform provider also enhances innovation and productivity and thus influences other partners dependent on the platform. (Li, 2009, p. 380) The *sources of value* are important for the logic of value and value co-creation. These sources of value incorporate flexibility²⁷, efficiency²⁸ and innovation benefits²⁹ as well as network externalities³⁰. Through *value appropriation*, the amount of captured value also warrants participation in the ecosystem. A fair value appropriation is ensured by trust and relationship. (Thomas and Autio, 2012, p. 7pp)

Another characteristic of the business ecosystem is the *participant symbiosis*. Li (2009, p. 380) states that symbiosis is designated by a loose network of partners (e.g. suppliers, distributors and other firms). These relationships enhance the required symbiosis, but also provide flexibility in the selection of partners and the design of systems. Three elements are important in participant symbiosis: The *core competencies*, which are the specialist field of every participant, the *complementarity* of every participant, and the *co-evolution* of participants as they have to continue developing over time with others to maintain stability in the ecosystem and add

²⁷Can be achieved by co-specialization and complementarity of single participants in the ecosystem. The benefits are the awareness to identify and remove partners in the network, the continuous recognition of changing conditions and a faster time-to-market. (Thomas and Autio, 2012, p. 8)

²⁸Through activity interlinking and resource leverage; becoming visible through transaction costs. Efficiency can lead to a competitive advantage in comparison to competitors. (Thomas and Autio, 2012, p. 9)

²⁹Can be realized by innovation generation or better ways of transferring technological opportunities. These benefits are not only valuable for the company, but also for the entire business ecosystem. (Thomas and Autio, 2012, p. 9)

³⁰e.g. standards or lock-in (Thomas and Autio, 2012, p. 9)

value to a product in the community. (Thomas and Autio, 2012, p. 10pp)

The third characteristic is *institutional stability*. Thus, the persistence of actors in the ecosystem, their organizing principles and governance structures are important. First of all, the *locus of coordination* is the central part of the business ecosystem and responsible for overall performance and health. This central part can be compared to the keystone participant, as described by Lansiti and Levien (2004a). The ongoing *legitimacy* and also the reputation of the business ecosystem are the responsibilities of the locus of coordination and define participation criteria for participants to stay within the ecosystem. With *governance mechanisms*, rules and norms for participants are defined, providing robustness and success in the ecosystem. As a result, rules, values and norms are part of the relationships between ecosystem participants and they build a framework in value co-creation. (Thomas and Autio, 2012, p. 12pp)

3.2 Development and Evolution of a Business Ecosystem

To develop a BE, various possibilities are conceivable. According to Zahra and Nambisan (2012, p. 222pp), there are four possibilities that differ in their nature of innovation and also in terms of governance, the required entrepreneurial activities, and strategic thinking:

- A business ecosystem can evolve around a group of companies with the goal of exploiting a market opportunity based on an innovation platform and shaped by a keystone player. In such an ecosystem, companies are part of the keystones' solution or add value in the form of complementary offerings to the keystones' offering.
- Business ecosystems may also be developed around a dominant firm that searches actively for new ideas, products or technologies, builds on them, and commercializes the solution. Here, the company has to think about sourcing mechanisms and openness to commercialization.
- Business ecosystems can also evolve around independent entities (e.g. research centers), entering radically new or emerging fields through collaboration.
- A business ecosystem can also be established by modifying existing products or platforms in order to create new opportunities. To address these opportunities, not only new products or platforms are required, but also new or modified business models.

Moore (1993; 1996) describes the development of a business ecosystem in four stages – birth, expansion, leadership and self-renewal.

The focus of stage 1, the *birth or pioneer phase*, is value creation because the new business model as well as the new value chain of the company are developed. In order to redefine the first concept, customers are required as early adopters, and learning in an experimental manner helps to improve the value proposition to fulfill customer needs. The new business ecosystem typically emerges on the perimeter of others, and companies in this stage normally operate in another BE. (Moore, 1993, p. 76pp; Moore, 1996, p. 102pp)

The *expansion phase* in stage 2 has to evaluate whether the idea is right for the market, which initiatives are needed in which sequence, as well as which growth rate is most appropriate for the ecosystem. The company has to consider whether the value provided is appropriate for the customers; if not, the company needs to return to stage 1 and rethink things. Stage 2 is all about the growth of the business ecosystem, how this growth can be handled internally, and how the ecosystem can be defended against rival business ecosystems. Thus, expansion and differentiation are important aspects in this phase. (Moore, 1993, p. 79p; Moore, 1996, p. 138pp)

In stage 3, the *design and structure* of the business ecosystem reaches a point of stability. The quantitative growth accelerates further, but the qualitative growth tends to slow down. In this stage, the niches of the business ecosystem become clear, and products, services, business processes and organizational arrangements are established. The participants also have to strengthen their roles because everyone tries to establish their own position. A leader is important in order to keep the ecosystem innovating and to protect its own role against competitors. Here, the *Red Queen effect*³¹ emerges for the first time. Thus, companies need to force instability to allow new innovations through the open architecture of the community. (Moore, 1993, p. 80p; Moore, 1996, p. 191pp)

Companies in stage 4, *renewal or death*, face the appearance of new ecosystems and the fact that existing business models are becoming obsolete. In this stage, companies have to refocus their organization on markets as well as economic micro-environments that suit them as well as possible. This can be achieved by focusing resources or targeting the appropriate niches. Companies may find that they are more successful in sub-segments of an ecosystem. (Moore, 1993, p. 81pp; Moore, 1996, p. 233pp)

The four stages of business ecosystem development can be compared to the life cycle of a company and development of the business model there. The empirical part of this research work mainly considers companies in stages 3 and 4 that have already established a business ecosystem and business model and need to rethink and improve it on a continuous basis in order to remain competitive. Possible ways of improving the business model are presented in more detail in chapter 5.

³¹The Red Queen effect explains that companies try to improve their traditional business in order to stay as good as they actually are (Voelpel et al., 2005, p. 37).

3.3 Participants and their Strategies in the Business Ecosystem

The development of a business ecosystem can be seen as a *trial-and-error learning process*, where changes take place through the behavior of network members by reinforcement of actions and their network theories³². This involves an adaptation of relationships, as well as the entry and exit of various companies in the network. The way in which the firm responds to changes is important because it defines how the network will respond and evolve as a whole. (Wilkinson and Young, 2002, p. 126)

The company *AT&T* is an example of the development of a business ecosystem. They realized that, from a service-centric viewpoint, customers will be served different communication and computing-based services. In some cases, customers buy complementary products and services which have to work together; in others they will buy only single items, but they also will buy product packages. For *AT&T*, it was not possible to satisfy all these customer needs and offer all of the products required. They had to learn to participate in multiple ecosystems, where not every ecosystem is controlled by them. Continuing innovation specialists are in the center of a business ecosystem, meaning that companies are specializing in the tasks they do best and work together with other companies in a flexible way to develop a complete solution. As a result, *AT&T* needed to identify the tasks they could do best and where they were able to differentiate themselves from others. This requires specializing in those tasks and creating an ecosystem around each single offer. Furthermore, agility in partnering with other specialists is required as well. (Moore, 1996, p. 38)

3.3 Participants and their Strategies in the Business Ecosystem

Different participants, such as customers, market intermediaries (e.g. agents and channels, companies selling complementary products and services), and suppliers are part of a BE, grouped around the core contributions. According to Moore (1996, p. 27), these participants build the *core business* and the *extended enterprise* (see figure 4). Other members, such as owners and other stakeholders, government agencies and regulators, associates and standardization bodies representing customers and suppliers as well as competitors are part of the business ecosystem. Besides well-established companies, new ventures also participate (Zahra and Nambisan, 2012, p. 220).

Iansiti and Levien (2004a, p. 70p) describe the BE from the company's point of view and see everybody as part of the company's business ecosystem with whom the company interacts and on whom the company is dependent. This includes competitors as well as customers affecting the company's products and processes, but also companies to which business functions are outsourced, financing provider institutions, and companies that deliver the technologies and

³²Wilkinson and Young (2002, p. 126) say that this process continues as long as a dynamic equilibrium can be achieved. This also depends on the interconnection between participants.

3.3 Participants and their Strategies in the Business Ecosystem

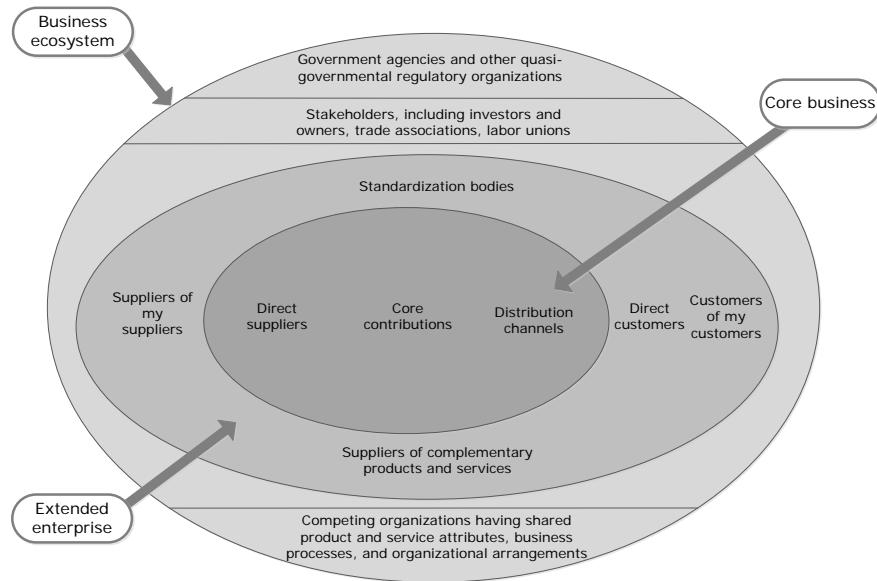


Figure 4: A typical business ecosystem (referring to Moore, 2005, p. 27)

complementary products needed. As Moore proposed, they also see regulatory institutions and media outlets as participants in the company's BE. The exact boundaries of the business ecosystem can barely be drawn because a lot of companies influence the company. The view of a BE provided by Iansiti and Levien (2004a) is also taken in this dissertation because it does not investigate a specific branch, but companies operating in several branches. Thus, the company investigated is the focus and all external actors are considered as the BE interacting and influencing the company.

In addition to participants in the business ecosystem, the literature also deals with such topics as the role embodied by the company in co-specialization, bargaining power or the existing relationships between partners. Scientific discussions also looked at the roles and actors along the value chain, whereas the power of the exchange partner over the company does not depend on the position the partner embodies. (Adner and Kapoor, 2010, p. 309) The network position of a company determines its location in the BE, embedded in a set of interacting relations which are part of the company's resource base. Furthermore, it refers to the company's role in the network and how the linkage (directly or indirectly) appears to other companies. The position of the company in the network depends on two facts: the pattern of direct and indirect relations with others and the power the company has in terms of its ability to access and control resources in the network, as well as the role and value of other participants. In doing so, companies can occupy different roles, like a leadership position or a more specialized role. The position is not fixed and may change because of the development of relations. (Wilkinson and Young, 2002, p. 125) The roles are seen as *strategies*, which are followed to maintain the health and performance of the company itself and of the network. Traditionally, the network

perspective focuses more on the interaction between the members and not on their roles and strategies, respectively, explained in the business ecosystem literature. (Anggraeni et al., 2007, p. 15) In the next two sections, the role in the ecosystem as well as different relations between companies are explained in more detail.

3.3.1 Roles and Strategies in the Business Ecosystem

Three types of roles or strategies are described in the business ecosystem literature: keystones, dominators and key species (Goethlich and Wenzek, 2004, p. 3; lansiti and Levien, 2004a, p. 74; lansiti and Levien, 2004b, p.67).

The characteristics of these three species are also transferred from biological ecosystems to the business world. In biology, niche players are small participants in comparison to the overall ecosystem and are weak in defending themselves against dominators and the capabilities they have at their disposal. If we transfer these ideas to the business context, niche players are predominantly small companies specialized in niche products. Very often, companies of this kind are taken over by larger, dominating companies. In comparison, dominators in biology aim to control the entire ecosystem by conquering other participants. In the business context, dominator strategies deal with such tasks as establishing entry barriers, discouraging others from entering, and so on. A keystone player in biology is responsible for keeping the ecosystem in balance and provides the niche species with living space. In the business context, keystone players support and protect niche players and also support the exchange between members of the BE. A keystone player acts on the market and collaborates with other partners. (Goethlich and Wenzek, 2004, p. 3pp)

lansiti and Levien (2004a, p. 74) say that the kind of strategy each participant chooses depends on the goal of the company itself as well as on its environment. This is determined by the complexity of relationships as well as the level of turbulence and innovation. These two criteria are used and positioned along the axes of a graph illustrating the most suitable strategy (see figure 5). If the company develops specialized expertise and unique capabilities and operates in a clearly defined business segment, a *niche strategy* is pursued. This strategy is chosen if the company faces steady and rapid changes and the assets of other firms can be leveraged. The *keystone strategy* is pursued if the company's business is at the center of a complex network, consisting of asset-sharing relationships, within a turbulent environment. The *physical dominator* operates in a mature industry with a stable environment, where the network relies on external assets. The assets needed are gained through the acquisition of partners or by taking over functions they possess. In pursuing such a strategy, the physical dominator becomes its own ecosystem and there is no longer any need for an ecosystem strategy. In comparison, a *value dominator* extracts as much of the yet uncontrolled value as possible, thereby destroying the whole ecosystem. A commodity business with a stable environment and independent

3.3 Participants and their Strategies in the Business Ecosystem

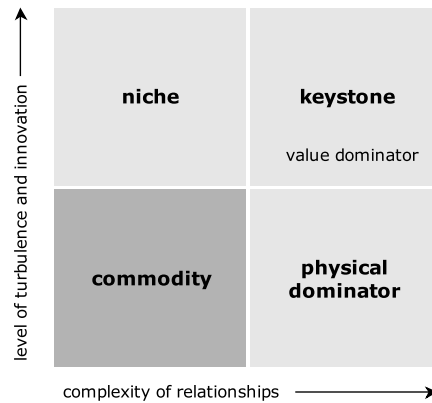


Figure 5: Strategies in a business ecosystem (referring to Iansiti and Levien, 2004a, p. 74)

working companies does not require an ecosystem strategy.

The main characteristics of each strategy are explained in table 4 and described in more detail in the following subsections.

Strategy	Characteristics	Synonyms
Keystone	<ul style="list-style-type: none"> - Improves the health of the ecosystem - The majority of value creation is shared with the net - Focus is on platform creation and sharing solutions to problems - The challenge: balancing value creation with value extraction and sharing 	<i>Hub</i> (Möller et al., 2005) <i>Channel or network captain</i> (Wilkinson and Young, 2002, p. 126; Ritter et al., 2004, p. 177) <i>Platform leader</i> (Cusumano and Gawer, 2002, p. 52) <i>Choreographer</i> (Shuman and Twombly, 2009, p. 13) <i>Orchestrator</i> (Heuskel, 1999, p. 64; Gundlach, 2006, p. 25) <i>Lead-firm</i> (Sturgeon, 2001, p. 16)
Dominator	<ul style="list-style-type: none"> - Integrates vertically or horizontally to manage and control a large part of the network - Occupies most of the nodes - Creates and captures most of the value itself - Focus is on control and ownership - Defines, owns and directs most of the things the network does 	<i>Classical & physical dominator</i> (Iansiti and Levien, 2004b, p. 76)
Hub landlord	<ul style="list-style-type: none"> - Extracts as much value as possible from the network without controlling it - Occupies very few nodes - Creates little value, but captures most of the value for itself - Brings instability into the ecosystem 	<i>Value dominator</i> (Iansiti and Levien, 2004b, p. 113)

Strategy	Characteristics	Synonyms
Niche player	<ul style="list-style-type: none"> - Develops specialized capabilities that differentiate this player from other players - Occupies most of the nodes, but has a very low physical presence - Creates and captures most of the value - Focuses on specialized capabilities and leverages others provided by the keystone 	<p><i>Layer player</i> (Heuskel, 1999, p. 57) <i>Turn-key supplier</i> (Sturgeon, 2001, p. 16), <i>Component supplier</i> (Sturgeon, 2001, p. 16)</p>

Table 4: Characteristics of business ecosystem roles (referring to Iansiti and Levien, 2004b, p. 75)

3.3.1.1 Keystones

Most complex systems have a key player or hub that is responsible for efficiency enhancement and network stability. Hubs can play an important role in the network by increasing the ease of connection between different participants and at the same time decreasing the complexity by coordinating and integrating the various participants to improve productivity and promote growth. Also, the robustness of the network can be increased if there is a hub. (Iansiti and Levien, 2004b, p. 66pp)

Iansiti and Levien (2004b, p. 68pp) define these players in business ecosystems as *keystones*. They are responsible for the health and the survival of the ecosystem and provide benefits for the entire ecosystem and its members. In the literature, keystones are denoted in different ways – either as *hubs* (Möller et al., 2005), *channel or network captains* (Wilkinson and Young, 2002, p. 126; Ritter et al., 2004, p. 177), *platform leaders* (Cusumano and Gawer, 2002, p. 52), *choreographers* (Shuman and Twombly, 2009, p. 13), *orchestrators* (Heuskel, 1999, p. 64; Gundlach, 2006, p. 25) or as *lead-firms* (Sturgeon, 2001, p. 16), but the idea behind these concepts is usually the same.

Cusumano and Gawer (2002, p. 52) describe platform leaders as “*companies that drive industry-wide innovation for an evolving system of separately developed pieces of technology*”, facing challenges from companies that also want to be platform leaders (so called wannabees) and complementors. The motivation of platform leaders is justified by their lack of resources to create the whole system (e.g. a PC) alone. Shuman and Twombly (2009, p. 13p) emphasize that, in their case, a choreographer is responsible for bringing people and resources into the network for collaboration purposes. Thus, the choreographer plays the role of entrepreneur and has to represent the network’s interests and enable a flow of value between and among network actors. He/She also has to act as a coach and mentor, where learning and a proactive development of skills and behavior are necessary. A common language to communicate with all participants is also required. The choreographer is responsible for organizing the network

and engages all network members required to fulfill the purpose of the network. (Shuman and Twombly, 2009, p. 13p)

Keystones provide a reliable platform on which other members can rely. Thereby, the keystone ensures its own survival and at the same time improves the health of the whole ecosystem. This *keystone strategy* focuses on managing external resources, shapes the structure of the external network and preserves the network's external health. To achieve their goals, keystones leverage necessary resources and capabilities around the entire network, sharing information, intellectual property or physical assets. The companies in a leadership role may change over time. Despite this, the function of the leadership role is valued by the community because it enables participants to move towards a shared vision, supports them in the alignment of their investments, and tries to find mutually supportive roles. The disappearance of a keystone can have enormous consequences or result in the collapse of the entire ecosystem. Due to their mutual dependence, there are self-reinforcing dynamics between the keystone and the ecosystem. The effects that keystones have on the ecosystem can be described in terms of *productivity, stability and diversity*. Keystones can enhance productivity by limiting or removing species that would otherwise lead to a disproportionate reduction in productivity. In addition, they enhance productivity by providing a basis on which others can rely, simplifying complex tasks or enhancing creation of efficient products by third parties. Diversity describes the capacity of the ecosystem to respond to environmental changes. As a result, stability is often enhanced directly. Robustness or stability is increased by investing in and incorporating technological innovations and by providing an interface and reference point for other participants. They also offer innovative technologies to other organizations and invest in new, important infrastructure to encourage niche creation. The stability also depends on management decisions, developed capabilities or the defined business models. (Moore, 1996, p. 26; Iansiti and Levien, 2004b, p. 82p)

An effective keystone strategy incorporates two fundamental components: *value creation and value sharing*. Value creation takes place through sharing and scaling of several assets, such as physical³³, financial³⁴ or intellectual assets³⁵. (Iansiti and Levien, 2004b, p. 92) Value sharing is important because the network would suffer and participants would switch to other keystones if the value created was not shared. This aspect distinguishes a keystone from a dominator and makes a business ecosystem more robust. In an effective keystone strategy, value creation and value sharing are coupled. The costs of value sharing need to be low for every partner and decrease in proportion to the number of partners. (Iansiti and Levien, 2004b, p. 95p)

Companies following a keystone strategy rely on competitiveness and also attack different

³³Physical assets are, for example, a manufacturing network (Iansiti and Levien, 2004b, p.92).

³⁴Financial assets can take the form of a venture capitalist investment or the acquisition of a complementary firm (e.g. Microsoft bought Navision) (Iansiti and Levien, 2004b, p. 92).

³⁵Intellectual assets can be provided in the form of software platforms, uniform standards (like Linux) or state-of-the-art tools (Iansiti and Levien, 2004b, p. 92).

competitors. The BE benefits because the keystone defends its competitiveness and constantly develops new products and capabilities. Companies pursuing a keystone strategy can use other strategies, like a dominator or niche strategy, in other domains, but also a keystone strategy in several domains. (Iansiti and Levien, 2004b, p. 103p)

3.3.1.2 Dominators

Dominators are very different to keystones. Two essential characteristics distinguish dominators from keystones: First, the physical size of a dominator is usually larger than that of a keystone. Second, there is a failure to encourage diversity. Either the dominators have to take over the species which they have eliminated or they have to eliminate their functions as well. In comparison, a keystone does not occupy a large portion of nodes in the ecosystem, whereas the dominator does. Dominated networks very often suffer from external shocks because they do not have the diversity in the network to respond to such changes. (Iansiti and Levien, 2004b, p. 72pp)

There are two different kinds of dominators. The *classical or physical dominator* integrates horizontally and vertically, and in doing so takes over a vast number of nodes. As a consequence, the dominators are responsible for most of the value creation and value capture in the network. The *value dominator or hub landlord* does not aim to control the network, but instead tries to control only the value extraction. As a result, less new value creation is provided, but as much value as possible is captured. (Iansiti and Levien, 2004b, p. 76) The hub landlord strategy brings instability to the business models of niche companies and further to the entire ecosystem. (Iansiti and Levien, 2004b, p. 113)

The classical dominator strategy is not always as dangerous as a hub landlord strategy because, in some niches, it can be effective and successful. In general, however, a dominator seeks to maximize value creation and value capture. Dominator firms usually have a closed product architecture that makes it impossible for others to leverage, build on, or extend the product. Like keystones, they incorporate critical hubs, but with the goal of taking over the ecosystem. In doing so, they eliminate other companies in their markets and expand into new markets with the aim of eliminating or dominating them. For dominators, it is important to invest in internal R&D to ensure that products from other companies do not provide a better offer to their customers. Technological innovations are essential. By reducing the diversity in the ecosystem, the dominator also reduces the ecosystem's strength to withstand external shocks. Over time, these ecosystems are threatened by other ecosystems that are much healthier. (Iansiti and Levien, 2004b, p. 115pp) Iansiti and Levien (2004b, p. 117) suggest a keystone strategy in turbulent environments because it leads to long-term success, whereas a dominator strategy only brings success in the short and medium term.

3.3.1.3 Niche Players

The largest numbers of participants in an ecosystem are *niche players*. They do not really have broad-reaching impacts on other species, but account for the vast majority and diversity of participants. Niche players normally have specialized capabilities that distinguish them from other companies in the network. Heuskel (1999, p. 57pp) describes companies following such a strategy as *layer players* (see section 4.2.3); Sturgeon (2001, p. 16p) further named *turnkey suppliers* and *component suppliers*, where turnkey suppliers provide a full package of services and component suppliers operate as sub-contractors for specific elements. Niche players leverage opportunities provided by the keystone and concentrate on acquisition capabilities (technical and business ones) supporting their strategy. At the same time, they enhance the division of labor in the ecosystem. (Iansiti and Levien, 2004b, p. 76p)

Niche players are dependent on other companies and therefore connect to them. They do not have stand-alone products, but instead they deliver specialized complementary components to the ecosystem which are interconnected; product boundaries are not that clear to the end customer. Niche players, therefore, need to balance the need to distinguish their products with the need to support and complement the offers of the ecosystem. This is realized by delivering a core contribution in the form of complementary goods or services. For value creation, a niche player has to specialize in unique capabilities that cannot be provided easily by an expanding keystone or dominator. Niche players also have to use the capabilities provided by keystones or other niches. This dependence also bears risks, which is why niche players try to diversify and connect with multiple keystones. For niche players, it is important to innovate constantly in order to sharpen their position in a niche. Examining technological threats and leveraging the ecosystem to develop response strategies are important in the development of such specialized solutions. In order to influence the way in which value sharing takes place within the ecosystem, the niche player has to think about the benefits of connecting with other participants. With a close connection, it is necessary to develop highly specialized assets in order to leverage the assets provided by others, thus entailing high switching costs. Close connections have advantages in the form of high efficiency, while the disadvantages take the form of the power the keystone has on the niche player and the risk of domination. Furthermore, close connections result in high vulnerability in technological and business model changes. In comparison, loosely connected interactions do not require such high specialization; switching from one partner to the other is much easier. The interface between the companies is only small and of a technological nature, and hold-up risks are minimized. Pursuing loose connections enables an easier switch to a different form of business; niche players stay mobile and can negotiate on the power of the keystone, who tries to extract the most value for itself. In doing so, niche players prevent a keystone from becoming a dominator. (Iansiti and Levien, 2004b, p. 128pp)

3.3.2 Relationships between Business Ecosystem Participants

The successful management and development of relationships with other companies is seen as a source of competitive advantage; it can also develop into a core competence of the company. (Ritter et al., 2004, p. 176) Isckia and Lescop (2009, p. 40p) state that the full value created in a network is dependent on the relationships between participants in the network. The network of partners is seen as a *source* of company renewal and not as an external threat (Anggraeni et al., 2007, p. 15). The business ecosystem consists of a mesh of relationships; and the activities of each company rely on these relationships. Every relationship is different and can be characterized by different factors (e.g. intensity). These factors determine the importance of the relationship for the specific tasks in the company (e.g. innovation process). With the help of relationships, the company gains access to resources (e.g. knowledge, technologies) from other participants and in turn provides resources to the others as well. This enables the company to concentrate on its core competencies and to acquire non-core competencies on the market. It can be concluded that the firm consists of a set of network relations that are important in order to fulfill objectives. (Golinelli et al., 2002, p. 82p)

Goethlich and Wenzek (2004, p. 12) define a relationship as a “*coupling between two entities in the sense of an enterprise network.*” Holmlund and Törnroos (1997, p. 305) describe a relationship as “*an interdependent process of continuous interaction and exchange between at least two actors in a business context.*” Wilkinson and Young (2002, p. 124), for example, say that “*relationships are the focus of substantial investments in time, money and effort and are the means by which knowledge as well as other strategically important resources are both accessed and created.*” Besides this, there are connections to other relationships, resulting in a system of *interdependent relations*, i.e. a business network. Relationships are seen as a connection between two companies or organizations that are limited in time, should be beneficial for both parties and have the goal of increasing value and/or lowering costs. In general, a company has approximately 10 important relationships. (Ritter et al., 2004, p. 176)

Relationships differ in the continuum between market and hierarchy, whereas networks are positioned between market and hierarchy (see figure 6). A *market* is defined as the coordination of economic exchange processes between suppliers and buyers exchanging a predefined value. In market relationships, only prices and quantities are transferred, most of the time as a one-time event without further involvement (“arm’s-length transaction”). Such relationships exist very often and yield no competitive advantage for either party. In a *hierarchy*, hierarchical structures within an organization coordinate instructions through organizational rules (“firm”). *Networks* are seen as a hybrid organization between markets and hierarchies with independent forms of coordination (“quasi-firm”). (Håkansson and Ford, 2002, p. 137; Sydow and Duschek, 2011, p. 42pp) To generate profit out of a relationship, companies have to work together more closely than in simple market relationships because there is nothing special in a simple seller and buyer relationship. Instead, they have to build partnerships in order to invest in relation-specific

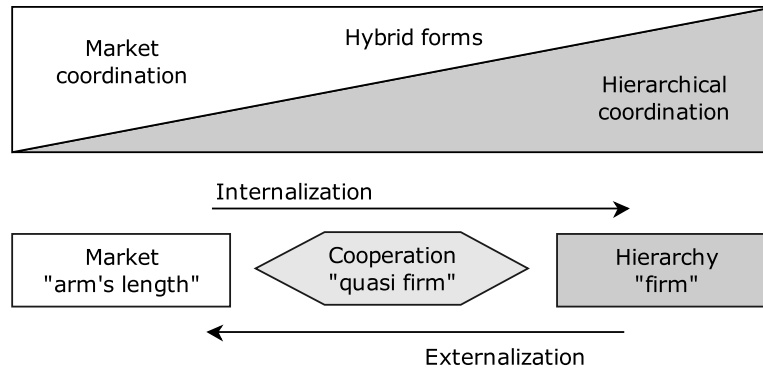


Figure 6: The network as hybrid form between market and hierarchy (referring to Dillerup and Stoi, 2010, p. 415; translated by the author)

assets, where an essential knowledge exchange as well as joint learning takes place and resources are combined (complementary or scarce resources), resulting in the collaborative development of new products or a lowering of transaction costs. Network relationships are a strategic dimension for the achievement of company goals. This can be in the form of a networked supply chain, integrated procurement processes or R&D in the form of networked technology partnerships. (Dyer and Singh, 1998, p. 662; Goethlich and Wenzek, 2004, p. 12) Instead of developing independently of each other, they are interactive, evolutionary and responsive. The company has to define the scope of action in the relationship, but at the same time also think about potential limitations within that scope. The closer the relationship between them, the more interdependent they are. (Håkansson and Ford, 2002, p. 137) Different forms of relationships are described in the following section.

3.3.2.1 Types of Relationship

In a network, there may be different *levels of relationships* that need to be managed (see figure 7) (Ritter and Gemünden, 2003, p. 693). The first level highlights the *individual actor*, considering every actor in isolation. As companies do not act in isolation, there are relationships between individual people or business units, forming *individual dyads*. This is a simple buyer and seller relationship with several episodes and interactions between the two, as in business markets. Usually, networks are not that isolated; they are interconnected, normally around a center, resulting in a vast number of relationships, referred to as the *relationship portfolio*. In this portfolio, relationships can be aggregated with respect to the position of the firm (e.g. customer relationship), the same sizes of firms (e.g. small suppliers) or the same function they fulfill (e.g. innovation partners). Ritter et al. (2004, p. 179) describe the fourth level of management as *connected relationships*. These are indirect relationships (for example the customer's customers) without any direct involvement of the actor. The management at this level faces problems and opportunities from direct connections influenced by indirect

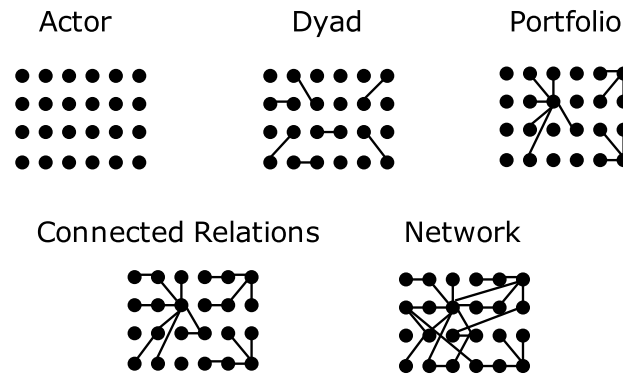


Figure 7: Network management of different levels of relationships (referring to Ritter et al., 2004, p. 179)

relationships. The *network* is the last level of management. Interactions take place between and within different companies and organizations, such as the government, in the network. Here, all relationships are considered (non-business and business relations) and analyzed by building subnets of relationships, like innovation networks.

Relationships also differ in their *dependence on or independence* of each other. If companies are not interdependent, no relationship is present and there is thus a *neutrality effect* (Ritter, 2000, p. 320). This denotes a competitive market with low switching costs where simple consumables are purchased. If one firm is more dependent than the other, Ritter et al. (2004, p. 178) speak about a *followership relationship*. The company that is more powerful can choose with whom to work and also determines the form of the relationship. The dependent firm has to adapt to the demands of the more powerful firm. Taking the position of the powerful firm, the relationship is a *leadership relationship*. If both participants have the same power, they are in a *mutual relationship*. In this form, a collaborative relationship is established where both companies are dependent on the input of the other. However, these relationships are not fixed; they can vary over time. In addition, the impact of this dependence can be positive or negative. Positive dependence exists if one company supports the other to achieve the objectives, mostly present in relationships with customers or suppliers. Negative dependence exists if one firm hinders the other in achieving the goals; this can be observed between competitors. In most of the relationships, both dependencies are present. (Ritter et al., 2004, p. 178)

Companies work together with a range of partners, like customers, competitors, or research institutions. (Ritter et al., 2004, p. 177). With the trend of outsourcing non-core activities to suppliers³⁶, it is important to create strong supplier relationships, especially where suppliers provide activities that are of strategic importance for the company. Additionally, relationships

³⁶The outsourcing of activities is designated as "quasi-externalization" and is seen as a way to build networks (Sydow and Duschek, 2011, p. 154).

with distributors and customers are strengthened. Reaching the end-customer can be very difficult, and distributors take the role act as gatekeepers between them. Thus, the relationship towards distributors is very important. A good relationship with customers means, for example, that the company and the customer jointly develop new products and services. Also, relationships with competitors can take various forms, for example the joint development of product and technology standards. (Möller and Halinen, 1999, p. 414p; Ritter et al., 2004, p. 177). These examples show that, besides *vertical relationships*³⁷ with suppliers or customers, there may also be *horizontal relationships*³⁸ to competitors. Also *lateral relationships* are possible, which are established between companies having no relation in value creation, nor are they competitors³⁹. These relationships differ from one another because cooperation or working towards a common goal is different to competition or being in conflict; they are different in their nature and need to be managed in a different way (Möller and Halinen, 1999, p. 414p; Ritter et al., 2004, p. 177; Bengtsson and Kock, 2000, p. 412; Golinelli et al., 2002, p. 82p). This leads to different types of relationships, like co-existence, cooperation, competition and co-opetition (Hearn and Pace, 2006, p. 61; Bengtsson and Kock, 1999, p. 179pp). The shift from competition or cooperation to co-opetition is an important characteristic of business ecosystems. A precondition is interdependence of the interests of all parties involved to generate this value. (Hearn and Pace, 2006, p. 61) These relationships further depend on the motivation for working together, how intensive collaboration is and how dependent the parties are on one another. The more distant they are, the more rivalry there will be. (Bengtsson and Kock, 1999, p. 179)

A relationship based on *co-existence* consists of information exchange and social factors, excluding an economic exchange. Competitors do not interact with each other, but they know about each other. Furthermore, the stronger ones dominate and create dependency in weaker competitors. They trust each other informally and the distance between the two is based on psychological factors. (Bengtsson and Kock, 1999, p. 179pp)

Cooperative relationships are more frequent and embody business exchanges. This kind of relationship is based on functional aspects and can be formal or informal. Formal agreements may be in the form of strategic alliances or partnerships and informal ones are based on trust and social norms⁴⁰. Cooperative relationships are built around a mutual interest, are visible and normally distribute activities and resources between companies in the supply chain. (Bengtsson and Kock, 1999, p. 179pp; Bengtsson and Kock, 2000, p. 415; Vuori, 2005, p. 908p)

³⁷Vertical relationships are connections between companies, incorporating upstream and downstream relationships, for example to suppliers and buyers (Dillerup and Stoi, 2010, p. 417).

³⁸These are relationships between companies in the same value-added step, for example between competitors (Dillerup and Stoi, 2010, p. 417).

³⁹Such relationships can exist between companies offering products which are complementary and sold together, for example groceries at a gas station (Dillerup and Stoi, 2010, p. 417).

⁴⁰For a detailed description of different cooperative forms like strategic alliances, licensing, joint ventures or cartels, see Sydow and Duschek (2011, p. 81pp) or Picot et al. (2012, p. 239pp). A detailed description of all forms of cooperation would go beyond the scope of this thesis.

An example of a cooperation is the relationship between a software designer and hardware manufacturer producing an application together (Vuori, 2005, p. 908p). Camarinha-Matos and Afsarmanesh (2006, p. 28) differentiate between *coordination*, *cooperation* and *collaboration*. In coordination, information is exchanged and activities are aligned, but value is created individually and goals are set individually. In collaboration, activities are planned, implemented and evaluated together to pursue the same goals. Cooperation is located between the two. As the distinction between these three concepts is not always clear and the term cooperation often also covers the concept of collaboration in the literature, this research uses the term cooperation for the remainder of the thesis, covering both cooperation and collaboration.

Competitive and cooperative relationships are completely different. In general, *competitive* relationships are conflicting because of diverging interests. Furthermore, competitive relationships are mainly of an informal nature and invisible, with only social exchange and exchange of information⁴¹. (Bengtsson and Kock, 2000, p. 414) Competition exists if there is an action-reaction pattern; one competitor follows the other one. The power, dependence and strength depend on the respective position of each competitor and define the form of competition. (Bengtsson and Kock, 1999, p. 179pp) A competitive relationship, for example, can be a relationship between competing organizations producing the same product. (Vuori, 2005, p. 908f)

In *co-opetitive* relationships, both cooperation and competition are present, including economic and non-economic exchanges (Bengtsson and Kock, 1999, p. 179pp). The concept of co-opetition was established by Brandenburger and Nalebuff (1996), explaining co-opetition with the help of the game theory. For them, a company is a competitor "*if customers value your product less when they have the other player's product than when they have your product alone*" (Brandenburger and Nalebuff, 1996, p. 18). However, Bengtsson and Kock (2000, p. 414p) describe competition very simply – the competitor needs to be in the same product area. They do not see cooperation and competition divided between companies, but between activities, because competition and cooperation in the same activity is impossible. Moreover, there are co-opetitive relationships with more elements of cooperation and others that are more competitive. Co-opetitive relationships are complex because they consist of different logics of interaction – hostility on the one hand because of conflicting interests and friendliness on the other hand because of common interests. (Bengtsson and Kock, 2000, p. 412) Such a relationship can exist between companies, for example, that compete in one market and cooperate in another one (Vuori, 2005, p. 908p) or companies that cooperate in common concerns and compete in other topics (Winston, 2014, p. 63). For example, Coca-Cola works together with its competitor PepsiCo in a project to find alternatives to the existing polluting chemicals for keeping the beverages cold; otherwise, they are competitors (Winston, 2014, p. 63). Vuori (2005, p. 911) highlighted that companies with knowledge-intensive services mainly

⁴¹Bengtsson and Kock (2000, p. 414) explain that competitors are normally informed about the activities of others.

have cooperative, competitive and co-opetitive relations. These relations can be close and share knowledge, learning and innovation.

A relationship can also be determined according to its *strength* in terms of how weak and distant or how close and strong the relationship is, respectively. The strength of a tie is characterized by a combination of “*the amount of time, the emotional intensity, in intimacy and the reciprocal services*” (Granovetter, 1973, p. 1316). Granovetter (1973) distinguishes between *weak and strong ties*. Weak ties are found in a low-density network, whereas the network density is high if there are strong ties. He argues that, in weak ties, strong relationships are present with others and a high-density network exists separately. However, a weak tie bridges the two high-density networks and would not be present if the weak relationship did not exist. Granovetter (1983, p. 202pp) further argues that, without weak ties, social systems would be fragmented and incoherent; information and new ideas would not spread widely. Thus, the weak ties forming a bridge are of value to individuals because they connect different groups. Strong ties are normally available more easily and entail greater motivation for assistance. For example, value-chain partnerships are the strongest and closest cooperation between suppliers and customers because their goal is value creation for the end-customer. To achieve this goal, companies from different industries and with complementary skills work together. In such cooperation, companies may play several roles which differ according to the form of cooperation they have. (Moss Kanter, 1994, p. 98)

Relationships between two companies also influence other companies because they are *interconnected*. This means that actions taking place in one relationship will also affect other connected relationships in different ways – marginally, but also substantially. A relationship between two companies is dependent on different factors, such as incidents in the past or learning effects. Thus, every interaction needs to be understood with reference to its relationship and every relationship needs to be understood in the context of the operating network. These interconnections can be a combination of advantages if the companies allow pooling of their resources or sale of a system if different companies establish a system together. (Bengtsson and Kock, 1999, p. 189; Ritter, 2000, p. 318; Håkansson and Ford, 2002, p. 134)

Relationships may not have any effect on one another. In addition, several other effects may be present. One of these is a *one-sided positive effect*, where previous experience can be used in other relationships as well (e.g. products developed in a collaboration). A *two-sided positive effect* exists when relationships presuppose each other or insist on the existence of the other one, also known as a synergy effect. A *one-sided negative relationship* exists if one relationship hinders the other (e.g. a customer wants exclusive rights to purchase a product). Further combinations of the impacts relationships can have are described by Ritter (2000, p. 320p).

Figure 8 summarizes the different forms and aspects of a relationship in the form of a “relationship map”. The different dimensions cannot be considered as completely separate from one another because they are also interconnected if one relationship only incorporates some of

3.3 Participants and their Strategies in the Business Ecosystem

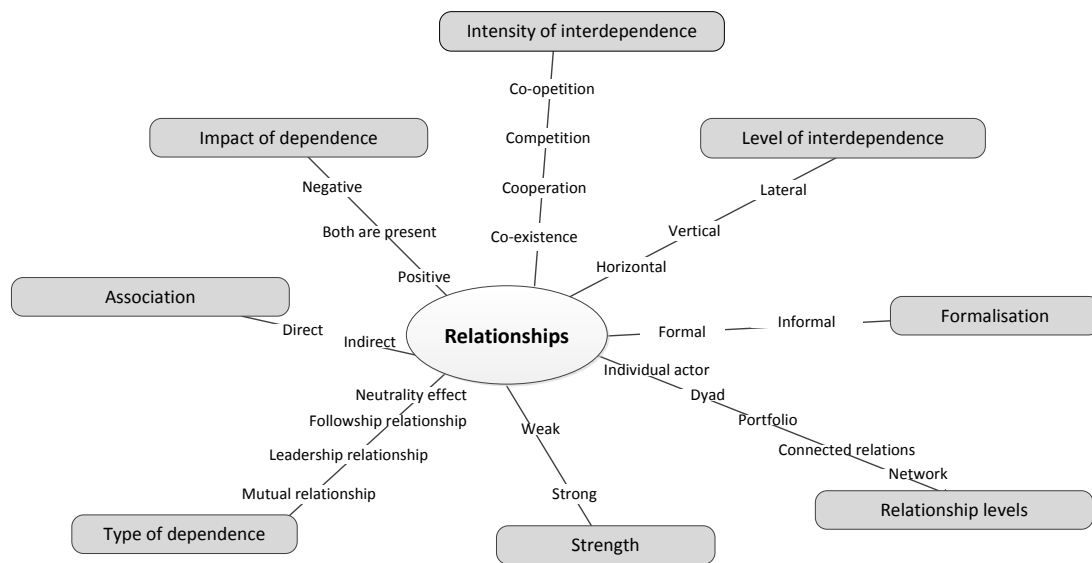


Figure 8: Map of different aspects characterizing a relationship (own illustration)

these aspects.

The management of relationships is necessary in order to be aware of all the effects a relationship can have (Ritter, 1999, p. 468). The company needs to bear in mind that relationships with one firm may have implications for relationships with other firms, as already mentioned. As a result, relationships need to be viewed in a network and not in isolation. (Ritter, 2000, p. 323) Ritter (2000, p. 325) further stresses the importance of communication and cooperation within the company because this reflects how companies operate at inter-organizational level. New communication structures should be established, which help to strengthen the company's network competence; new communication technologies can be helpful here. Different levels of relationships need to be considered as well. First of all, the company needs to understand the industry as a network of operation. Second, the relation of the company to its environment, in the case of its roles and positions, must be understood. This so called *focal net* comprises all of the actors interrelated with the company. Third, the portfolio of relationships incorporating all exchange relationships has to be managed. The fourth level deals with the management of every single relationship, its specific elements and the influence of the environment on these relationships. This requires the development of respective capabilities in the company, such as net management or relationship management. (Möller and Halinen, 1999, p. 416pp) As a result, these network competencies allow a company to establish, use and maintain a relationship with different partners (Ritter and Gemünden, 2004, p. 549).

3.3.2.2 Characteristics of Relationships

Relationships have different properties, which depend on the type of firm with which the relationship is established and its direct or indirect influence on the company's performance (Ritter et al., 2004, p. 176). Thus, different characteristics can shape relationships (see also figure 9) (Ritter and Gemünden, 2003, p. 692; Holmlund and Törnroos, 1997, p. 305p):

- *Mutuality*: Mutuality describes the quality and relationship closeness through trust and commitment. Partners *trust* each other when one partner believes that the other one will perform the actions planned. If this is the case, they also *rely* on each other. Furthermore, trust is demonstrated in the performing reliability of the partner and the fact that the partner is interested in the other's well-being. Trust-building is especially necessary when working together with customers. This can be achieved by means of frequent interaction, open communication, as well as a clear definition of roles and objectives. Determinants of trust are costs, information, as well as sharing of risks and rewards. Another antecedent of relationship closeness is *commitment*. Commitment describes how the development of relationships is based on mutual commitment and a relationship of value is maintained that will continue in the future. With a high commitment, the relationship can be stabilized. Mutual objectives and the long-term duration of a relationship determine the commitment. (Golinelli et al., 2002, p. 89pp; Ulaga and Eggert, 2006, p. 315; Romero and Molina, 2009, p. 406; Srivastava and Singh, 2010, p. 7p) Satisfaction is also important for the quality of a relationship and can be described in terms of repurchase intention, loyalty or word-of-mouth. If the customer feels that the performance of the product purchased is as expected or exceeds expectations, he/she will be satisfied, and in the opposite case he/she will be dissatisfied. (Ulaga and Eggert, 2006, p. 315) A low level of mutuality does not mean that a relationship ends because conflicts and resolving them are also part of a relationship.
- *Long-term character*: Relationships have long-term orientation and evolve over time. Short-term interactions and exchanges help to develop and change the relationship and to shape a long-term exchange pattern. Also, the strength of a relationship develops over time as partners continue working with each other and create bonds. The strength of a relationship is also determined by switching costs to another partner.
- *Process nature*: Relationships are built on interactions taking place as well as exchanges and adaptations between the companies. They are not static and change over time because they are dynamic. Furthermore, relationships provide a way of gaining access to resources which are of value to firms.
- *Context dependence*: All economic actions and outcomes are affected by relations the company has as well as the overall structure of network relations.

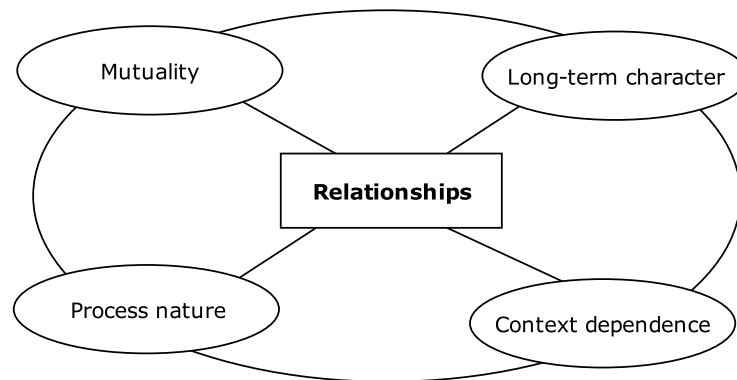


Figure 9: Characteristics of relationships (referring to Holmlund and Törnroos, 1997, p. 305p)

Moss Kanter (1994, p. 100) describes eight success criteria for working together. *Individual excellence* expresses the value each partner contributes to the relationship. The *importance* describes how important the relationship is in achieving the company's long-term goals. *Interdependence* makes partners aware of how they need and complement each other. To express the long-term commitment of a relationship, several *investments* are transacted by partners. A further success factor is *information*, because open communication is required in order to make the relationship work. To assure smooth running and enable teaching and learning, the partners have to build connections and *integrate* one another. *Institutionalization* expresses the formal status of the relationship, where decision processes and responsibilities are clearly defined. The last criteria is *integrity*, where mutual trust is enhanced and stated as being important.

3.3.2.3 Change of Relationships

Relationships and also the entire network develop because nodes or participants in the network invest in relationships and participants. Every development in the node creates opportunities for both participants, but relationships also create restrictions. In general, the stronger relationships are, the more content they incorporate and the more important they are for the life of the nodes. However, the freedom of the node to change is also restricted as a result. As the network and relationships there change over time, this also influences the company and other participants. Thus, a company seeking change is dependent on actions taken by others. However, the company itself can also mobilize others to change in one direction. This means that any change in the company depends to a large extent on the network structure; and a change in the network changes the company as well. Changes affect bonds between actors, links between activities or resource ties between companies and can take place at different levels – the network, the relationship or single actors. Further, it is more costly for companies to search for new partners in the network than develop relationships with existing ones because

knowledge has already been established, and the partners understand each other and how each partner interacts. (Halinen et al., 1999, p. 781; Håkansson and Ford, 2002, p. 134pp; Corsaro and Snehota, 2012, p. 270pp)

Halinen et al. (1999, p. 781pp) see every single dyadic relationship as the main source of change. They differentiate between two types of change: the confined change and the connected change. The *confined change* assumes a stable situation in the network, where only the content and strength of an existing relationship adapt. Changes occur, for example, in the form of shifts in the number of people involved in the relationship, the trust involved or the activities performed. Confined changes are of an incremental nature concerning only single relationships. In a *connected change*, changes in one relationship affect other relationships as well. This can have a domino effect and spread to other relationships in the network. Connected changes are of a radical nature because existing relationships disappear and new ones develop. It can be concluded that a change in a single dyadic relationship changes the relationship itself, but can also be the recipient and transmitter of change to other relationships.

3.4 Implications of Pursuing a Business Ecosystem Strategy

Prior to pursuing an ecosystem strategy, the company needs to ask itself the following traditional questions: *Where, when and how to compete*. To answer the question of where to compete, a thorough analysis of the project and the ecosystem is required. In an ecosystem, different participants are dependent on each other in their development and integrate their value chains. This should be aligned and, if necessary, a longer time period should be chosen, which answers the question of when to compete. The question of how to compete is a question that spans many boundaries because the company needs to choose which activities are performed in-house and which by the other partners. Also, the company must decide which role it wants to play (e.g. keystone position or a more passive role). No matter which role the company plans to embody, a profound knowledge of the entire ecosystem as well as its dynamics is required in order to be successful. (Adner, 2006, p. 106p) The topic of designing value creation is discussed in more detail in section 4.2.3.

Following a business ecosystem strategy has different implications for the company. First of all, the company is not independent anymore. The firm's performance is influenced by assets which are outside the company and are not controlled by it. This has implications for the whole company in terms of strategy, processes, product design and policy. Integration of these external assets is important and can be a form of innovation. This integration further means a fundamental change in the capabilities needed, but also in the structure of corporate functions (e.g. R&D, business processes). For example, products are not designed entirely by one company most of the time. These products exist in the context of other products, creating

opportunities as well as difficulties for the company. Opportunities lie in development of the product, where new products are based on the capabilities of existing ones. It is a difficult task to detect such capabilities and leverage them. Designers, therefore, need to see their products as part of a platform for others, within a system of different products. (Iansiti and Levien, 2004a, p. 77p)

A further implication of the business ecosystem strategy is the reality that innovation changes with ecosystem thinking. Up to now, competition took place *between companies*. Now, competition will be *between ecosystems* or domains in ecosystems as companies work together to innovate. (Iansiti and Levien, 2004a, p. 78; Isckia and Lescop, 2009, p. 38) In this context, Isckia and Lescop (2009, p. 39pp) describe the relevance of business ecosystems in open innovation, when companies decide to open their innovation processes and cooperate with partners. Thus, it is imperative to establish a network with different partners and provide the relevant resources as well as complementary goods and services. The development of platforms, especially with the help of information and communication technologies (ICT), helps to shape relationships with partners in an open innovation process. The more open they are, the more collaboration is possible and the more innovative opportunities are generated for the business ecosystem.

The value created in the business ecosystem is normally higher than the value created alone. The challenge associated with this is the independence of innovations from each other. The company must, therefore, bear in mind the external resources needed (not only the company's own resources) as well as the time required for innovation because innovations by different partners and complementing products need to be coordinated. An innovation without the required complements negatively impacts its market potential. (Mäkinen and Dedehayir, 2012, p. 7p) This risk of dependency is also highlighted by Adner (2006, p. 99p). He describes it as *timing risk*, where all participants have to be ready for the market before competitors are. Also, resource allocation bears risks if the bottleneck is located outside the company. Thus, risk assessment is a critical task in an ecosystem. Especially in innovation ecosystems, risks appear in the form of uncertainties in project management, in coordination of complementary innovators and due to adopting the solution along the value chain. (Adner, 2006, p. 99p)

Chapter 4

The Business Model Concept

The business model (BM) can be used as a model for the *analysis, planning and communication* of business activities. In an analytical manner, the BM can be utilized to describe elements representing the reality of the company and the systemic relationship between these elements. As a planning model, the BM provides help in establishing plans as well as in enhancing new business activities. As a model for communication, it provides a consistent, structured picture of all current and planned activities for internal and external stakeholders. (Bieger and Reinhold, 2011, p. 26p)

This chapter first describes the origins of the BM and presents and discusses several definitions of the concept. Then, elements defining the BM and their interconnection as well as different BM levels are described.

4.1 Origins and Definitions of the Business Model

Due to the fact that the business model concept was developed in several scientific fields, its origins have not yet been clarified to date. These developments led to different views of the BM and later to several definitions appearing. The next sections illustrate the historical development of the BM and present several definitions from the various scientific fields.

4.1.1 Historical Development of Business Models

The origins of the BM concept in practice and in research have not been clarified so far. Researchers in management and business science see the origins of the BM in publications by

Peter Drucker in 1950. He described the ancestor of today's BM concept in management in the "logic of business" (Bieger and Reinhold, 2011, p. 14) In comparison, scientists in the field of information systems and business informatics see the origins of the BM in the mid-1970s, when the concept was used under the term "business modeling" in information technology as well as computer and system modeling and the corresponding journals (Ghaziani and Ventresca, 2005, p. 536p; Zollenkop, 2006, p. 27p; Bieger and Reinhold, 2011, p. 14; Wirtz, 2011b, p. 7). Business models were understood as simple descriptions of a business aspect for the purpose of demonstration and support for communication (Bieger and Reinhold, 2011, p. 14). Thus, the etymological origin of business models is found in information modeling and creation.

Since the mid-90s, the meaning of the BM concept has changed. It is now conceived as a holistic description of corporate activities in an aggregated form. As a result of this shift, the BM has achieved strategic importance at all company levels – corporate, business unit and functional level. Topics like the revenue model or relationship management have gained increasing interest. (Ghaziani and Ventresca, 2005, p. 543; Zollenkop, 2006, p. 29; Wirtz, 2011b, p. 7)

Establishment of the Internet and e-commerce pushed the BM to become an important concept for companies. In the new economy, the BM became the understanding and central aspect of the company; it developed into a central concept for any business idea and was used interchangeably with the terms *business idea*, *business concept*, *revenue model* or *economic model*. When this happened, the understanding of the BM as a modeling tool took a back seat and the strategic part of the model became the new focus. The distinction between strategy and BM became clearer, although it still cannot be clearly distinguished today. Seddon et al. (2004, p. 428) stated that people with a management background use the term strategy, whereas people with a background of information technology prefer using the term BM. (Wirtz, 2011b, p. 8)

Furthermore, business models were influenced by value creation, which became one of the most important aspects of the concept. These developments result from the fact that new methods of value creation and structuring the value chain emerged with the possibilities of the Internet. (Wirtz, 2011b, p. 8)

Later on, the BM concept also raised interest in the old economy, where companies reviewed their existing business models and integrated e-business components into them. This led to a mixture of old and new economy business models (Zollenkop, 2006, p. 31p). With these changes in established business models, terms like *business model change* or *business model innovation* emerged (see chapter 5). This also created a new quality in scientific discussions, which have become increasingly important in the past few years.

Despite the frequent and common usage of the term BM in practice and in research, there have been no common definitions of business models until now. This is because development

and usage of the terminology started in different scientific communities at the same time. The results are developed concepts consisting of diverse elements that are based on different socio-scientific disciplines (Tece, 2010, p. 175p; Bieger and Reinhold, 2011, p. 16). Only a few universal definitions of business models (e.g. the BM canvas from Osterwalder and Pigneur (2010)) exist so far. Due to the complexity of the concepts developed from these different approaches, discussions of the definition are still ongoing. (Wirtz, 2011b, p. 9).

According to the different historic developments of the BM, Wirtz (2011b, p. 15) structured the emerging BM concepts along three theoretical approaches – technology-oriented, organization-oriented and strategy-oriented concepts. Figure 10 highlights the main facts of these approaches and their appearance in the context of BM concept development.

	Business Informatics	Management Theory	
Development:	<p>Information technology oriented</p> <ul style="list-style-type: none"> - Phase I (1975-1995): business modeling for system construction - Phase II (since 1995): e-business 	<p>Organization theory oriented</p> <ul style="list-style-type: none"> - Management as Science: Taylor (1911), Gilbreth (1911), Fayol (1916) - Various organization schools (e.g. contingency theory, transaction cost theory) - The structuring of organizations: Mintzberg (1979) 	<p>Strategy oriented</p> <ul style="list-style-type: none"> - Innovation: Schumpeter (1934) - Strategy and Structure: Chandler (1962), Ansoff (1965) - Resource-based-view: Penrose (1951), Barney (1986) - Market-based-view: Porter (1971)
Establishment as basic approach of the business model concept:	<ul style="list-style-type: none"> - Since 1975 - Development parallel to the business model term 	<ul style="list-style-type: none"> - Since 1995 - Structure detached from IT - Business structure/ Business plan/ Business architecture 	<ul style="list-style-type: none"> - Since 2000 - Strategic business structuring - Business model innovation - Value creation
Important authors:	<ul style="list-style-type: none"> - Timmers (1998) - Wirtz (2000) - Afuah/Tucci (2003) 	<ul style="list-style-type: none"> - Linder/Cantrell (2000) - Keen/Quereshi (2005) - Tikkanen/Lamberg (2005) 	<ul style="list-style-type: none"> - Hamel (2000, 2001) - Chesbrough/Rosenbloom (2002) - Zott/Amit (2008)
	Business model concept		

Figure 10: Basic theoretical approaches for the business model concept (referring to Wirtz, 2011b, p. 15)

Technology-oriented concepts are shaped by business modeling as well as e-business. Several methods and tools were developed for business modeling in information technology to support the documentation, analysis or conceptualization of processes. The BM is used to describe operational activities and is very much function-oriented. With the rise of the Internet, the BM developed from only describing the processes available to become the first step of a modeling process. (Wirtz, 2011b, p. 15) In the literature, technology-oriented BM approaches are closely connected to the Internet and electronic business. One of the first concepts was described by Timmers (1998, p. 3p), explaining a BM approach for the electronics business. The basis for this was the value chain from Porter (1985), the reconfiguration of which can generate new

business models. Other representatives of technology-oriented approaches are Afuah and Tucci (2000) and Hedman and Kalling (2003).

Organizational-theoretical approaches focus on the organizational structure. With this research stream, the BM lost its connection to information systems and became a decision-making instrument. In organization-oriented concepts, the BM is represented as an analytical tool as well as an abstract representation of the company's structure and architecture. (Wirtz, 2011b, p. 11p) Representatives of this BM view are Linder and Cantrell (2001) and Tikkanen et al. (2005). Tikkanen et al. (2005, p. 7pp) explain their BM concept as a cognitive supporting system, which allows managers to make structured decisions. They define a causal relationship between the cognition of managers, their resulting actions and the BM. The goal is to have a better understanding of the relationships between decisions inside the company.

Many papers relating to business models and strategy have appeared since 2000. These *strategy-oriented approaches* have the focus to connect the BM and the strategy. In this way, two streams have influenced the development of the BM: With the new economy, entrepreneurial activities for the establishment of a new company came into the foreground. Later on, the focus lay on renewing an established company. Innovating the company with the help of a new BM gained increasing interest in research and practice; the BM view was oriented towards innovation. (Wirtz, 2011b, p. 14p) One BM concept in this field is described by Magretta (2002, p. 87). She defines business models as “*stories that explain how enterprises work*”. With her concept, she tries to delimit the BM concept towards the strategy concept⁴². Another representative in this category is Hamel (2001, p. 83). He describes the necessity of innovations in a BM as a means of gaining competitive advantages.

The next section provides a deeper insight into different definitions and perspectives on business models.

4.1.2 Business Model Definitions

A business model consists of the two terms *business* and *model*. A business is a company with the goal of making a profit. A model is a simple representation of reality that consists of elements and their relationships. Thus, a BM is a simple representation of a profit-oriented company, consisting of important elements of the company and the relationships between them (see figure 11). (Meinhardt, 2002, p. 7; Umbeck, 2009, p. 48) In its role as a model, the

⁴²Magretta (2002, p. 91) explains the difference as follows: A BM is a system explaining how all pieces fit together, without integrating an important performance aspect – the competitors. A strategy describes how to perform better than competitors by being different.

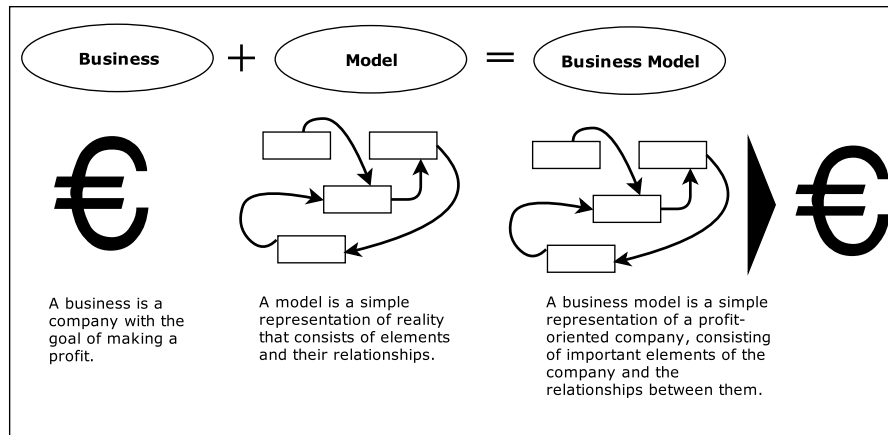


Figure 11: Description of a business model (referring to Meinhardt, 2002, p. 8; translated by the author)

BM can play different kinds of roles, as a framework⁴³, a mental model⁴⁴ or as a design and management model⁴⁵. (Nemeth, 2011, p. 84pp)

This is a very simple understanding of a BM as a model in general. As discussed in the last section, the BM developed from different theoretical disciplines with concepts appearing from social sciences or business studies, discussing different aspects of the BM. Due to the fact that the BM concept has no conceptual home in a theoretical discipline, the resulting definitions show a huge variance. (Teece, 2010, p. 175p) Table 5 illustrates the variance of different definitions of the BM concept.

Definitions of business models appear in different forms and degrees of abstraction. Massa and Tucci (2013, p. 20pp) therefore structured available BM definitions according to different forms and levels of abstraction (see also figure 12). The highest level of abstraction is the *narrative* level, where the BM is explained in verbal forms. Magretta (2002) is a representative of describing the BM verbally. One level down, different BM *archetypes* are described. Archetypes define BM typologies, like the Razor Blade or the Freemium BM. These typologies act as role models and are applied to branches where products are positioned on the market following the same logic. *Graphical frameworks* are a popular form with which to conceptualize or formalize business models. This is usually realized by describing the BM as consisting of different elements. The business model canvas by Osterwalder and Pigneur (2010) is a famous example of a graphical framework. *Meta-models*, as explained by Casadesus-Masanell and Ricart (2010), are business models described through system dynamics, based on choices and

⁴³Here, the BM is structured according to different dimensions and categories (Nemeth, 2011, p. 85).

⁴⁴Mental models help to analyze and interpret complex aspects and show relationships and causalities in order to understand the real system (Nemeth, 2011, p. 86).

⁴⁵As a management model, it helps to generate courses of action and supports the decision-making process (Nemeth, 2011, p. 88).

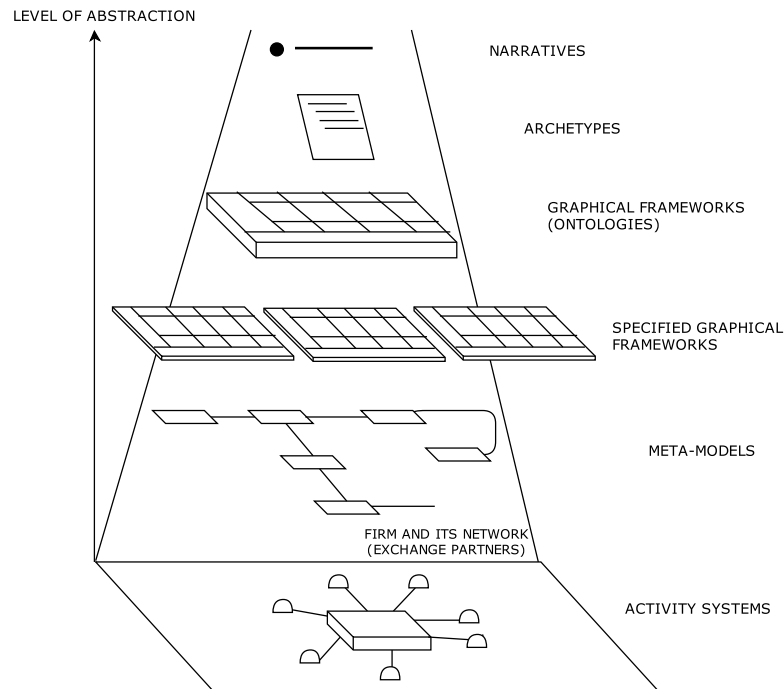


Figure 12: Different levels and abstractions of business models (referring to Massa and Tucci, 2013, p. 20)

consequences in the BM. Gordijn et al. (2000) use the e3-value ontology to formally describe a BM of this kind, with the focus on value creation in the network of partners. Zott and Amit (2010) provide an *activity system perspective* – the lowest level – of designing a BM. The BM is expressed through interdependent activities in the company, also integrating partners such as customers or suppliers.

Author	Definition
Timmers (1998, p. 4)	A business model is the “ <i>architecture of 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 various business actors; and a description of the sources of revenues.</i> ”
Amit and Zott (2001, p. 493)	“ <i>A business model depicts the design of transaction content, structure, and governance so as to create value through the exploitation of business opportunities.</i> ”
Govindarajan and Gupta (2001, p. 3)	A business model is the result of answering three questions: “ <i>1. Who are my target customers? 2. What value do I want to deliver to them? 3. How will I create it?</i> ”
Petrovic et al. (2001, p. 2)	A business model “ <i>describes the logic of a ‘business system’ for creating value that lies behind the actual processes.</i> ”

Author	Definition
Chesbrough and Rosenbloom (2002, p. 533p)	<p><i>"The functions of a business model are to:</i></p> <ul style="list-style-type: none"> - <i>articulate the value proposition, that is, the value created for users by the offering based on the technology.</i> - <i>identify a market segment, that is, the users for whom the technology is useful and for what purpose.</i> - <i>define the structure of the value chain within the firm required to create and distribute the offering.</i> - <i>estimate the cost structure and profit potential of producing the offering, given the value proposition and value chain structure chosen.</i> - <i>describe the position of the firm within the value network linking suppliers to customers, including identification of potential complementors and competitors.</i> - <i>formulate the competitive strategy by which the innovating firm will gain and hold advantage over rivals.</i> <p><i>"</i></p>
Magretta (2002, p. 4)	<p><i>Business models are "stories that explain how enterprises work. A good business model answers Peter Drucker's age old questions: Who is the customer? And what does the customer value? It also answers the fundamental questions every manager must ask: How do we make money in this business? What is the underlying economic value that explains how we can deliver value to the customers at an appropriate cost?"</i></p>
Afuah (2003, p. 2)	<p><i>"A business model is a framework for making money. It is the set of activities which a firm performs, how it performs them and when it performs them so as to offer its customers benefits they want and to earn a profit."</i></p>
Mitchell and Coles (2004a, p. 17)	<p><i>"A business model is the combination of 'who', 'what', 'when', 'where', 'why', 'how', and 'how much' an organization uses to provide its goods and services and develop resources to continue its efforts."</i></p>
Osterwalder and Pigneur (2005, p. 5)	<p><i>"A business model is a conceptual tool containing a set of objects, concepts and their relationships with the objective to express the business logic of a specific firm. Therefore we must consider which concepts and relationships allow a simplified description and representation of what value is provided to customers, how this is done and with which financial consequences."</i></p>
Schweizer (2005, p. 43)	<p><i>"[...] a business model consists generally of three interrelated dimensions. First, the value chain constellation defines how the company is positioned within the industry and how it aims at creating added value as a result of the deconstruction process. Second, it is important to determine where the competitive advantage/market power of the company comes from, i.e. whether it stems from a new innovation or whether it is rooted in the possession of/access to necessary complementary assets. Third, the revenue model describes how the company makes money including the definition of the customers and how to address them."</i></p>
Shafer et al. (2005, p. 202)	<p><i>"[...] a business model as a representation of a firm's underlying core logic and strategic choices for creating and capturing value within a value network."</i></p>

Author	Definition
Voelpel et al. (2005, p. 40)	<i>"The term 'business model' can generally be defined as: The particular business concept (or way of doing business) as reflected by the business's core value proposition(s) for customers; its configured value network to provide that value, consisting of own strategic capabilities as well as other (e.g. out-sourced/allianced) value networks; and its continued sustainability to reinvent itself and satisfy the multiple objectives of its various stakeholders."</i>
Johnson et al. (2008, p. 52)	A business model <i>"consists of four interlocking elements that – taken together – create and deliver value."</i>
Zott and Amit (2008, p. 1)	<i>"The business model is a structural template that describes the organization of a focal firm's transactions with all of its external constituents in factor and product markets."</i>
Liedtka (2009, p. 1)	<i>"A business model lays out both how an organization creates value with a particular offering and how it captures value as a result of doing so."</i>
Casadesus-Masanell and Ricart (2010, p. 196)	<i>"Business Model refers to the logic of the firm, the way it operates and how it creates value for its stakeholders."</i>
Demil and Lecocq (2010, p. 228)	A business model <i>"is ultimately a blueprint – even a recipe – that fulfills important functions such as enabling description and classification"</i>
Johnson (2010, p. 22)	<i>"A business model, in essence, is a representation of how a business creates and delivers value, both for the customer and the company."</i>
Osterwalder and Pigneur (2010, p. 14)	<i>"A business model describes the rationale of how an organization creates, delivers and captures value."</i>
Schallmo and Brecht (2010, p. 4)	<i>"A business model is a description of how an organization combines a set of elements to create value to customers and partners. The value maintains relationships to customers, supports differentiation from competitors and is created with products and services."</i>
Teece (2010, p. 173)	<i>"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 the value."</i>
Gassmann et al. (2011, p. 198)	<i>"Im Grunde ist ein Geschäftsmodell die Art und Weise, in der ein Unternehmen Wert schafft, seinen Kunden Nutzen stiftet und Kunden davon überzeugt, für diesen Nutzen Geld zu zahlen. Ein Geschäftsmodell ist also die Umsetzung dessen, was das Management denkt, das der Kunde haben will, wie er es haben will und wie man damit etwas verdienen kann."</i>
Abdelkafi et al. (2013, p. 1340003-12)	<i>"A business model describes how the company communicates, creates, delivers, and captures value out of a value proposition."</i>
Berglund and Sandström (2013, p. 276)	A business model is described as <i>"(a) a high-level description of how a firm (or part of the firm) creates, delivers and appropriates value, that is (b) centered on a focal firm, but that also (c) transcends the boundaries of the focal firm"</i> .

Author	Definition
Gassmann et al. (2013, p. 7)	A business model defines <i>“wer die Kunden sind, was verkauft wird, wie man es herstellt und wie man einen Ertrag realisiert. Kurz gesagt, das Wer-Was-Wie-Wert? definiert ein Geschäftsmodell, wobei die ersten beiden ‘W’ die externe Dimension eines Geschäftsmodells adressieren und die letzten beiden ‘W’ die interne Dimension”</i> .

Table 5: A selection of business model definitions

Besides the different views and abstractions on how to describe a BM, the definitions listed in table 5 further show that the BM is a representation of the *logic* of the company or a business system (Petrovic et al., 2001, p. 2; Shafer et al., 2005, p. 202; Casadesus-Masanell and Ricart, 2010, p. 196; Teece, 2010, p. 173). Most definitions see the BM as an abstract view of the company, with the focus on describing different dimensions or elements that fit together and shape the BM. These descriptions correspond to specified graphical frameworks presented in figure 12, but also differ in the number of elements defined and their detailed description and complexity. To provide a deeper insight into the BM and its elements, the concepts of Osterwalder and Pigneur (2010) and of Johnson et al. (2008) are explained in examples.

Osterwalder and Pigneur (2010, p. 14) define a business model as *“the rationale of how an organization creates, delivers and captures value”*. They emphasize the importance of a shared understanding of the BM in the company and thus developed the *business model canvas* explaining the BM with the help of nine building blocks (see figure 13). These nine building blocks consist of customer segments, value proposition, channels, customer relationships, revenue streams, key resources, key activities, key partners and cost structures. Explained in brief, the nine building blocks describe the business model in terms of who is served (*customer segment*), what the *relationships* are between the company and the customers defined and the *channels* through which customers are served. In addition, it describes what value in the form of a bundle of products and/or services (*value proposition*) is provided to the customer and which processes and activities, respectively (*key activities*), *key resources* as well as which external partners (*key partnerships*) are necessary for this purpose. In addition, information is provided on the costs incurred as a result of operating the business model (*cost structure*) as well as how much and in which way customers pay (*revenue stream*).

Johnson et al. (2008, p. 52) define the BM according to *four interlocking elements* (see figure 14): Customer value proposition, profit formula, key resources and key processes. They argue that *the customer value proposition is the most important element*; this explains that the company creates value for a given problem of the customer, the “job to be done”. How the company creates value for itself is defined in the *profit formula*, consisting of the revenue model, the cost structure, the margin model as well as the resource velocity. The *key resources* (e.g. assets like people, technology, channels) focus on key elements needed to create value for

4.1 Origins and Definitions of the Business Model

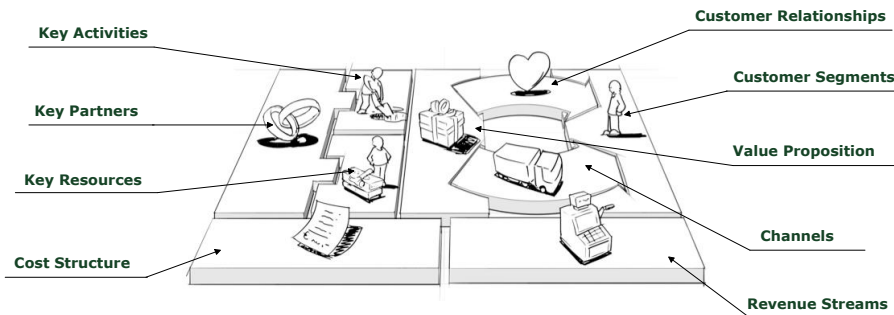


Figure 13: The business model canvas (referring to Osterwalder and Pigneur, 2010, p. 18p)

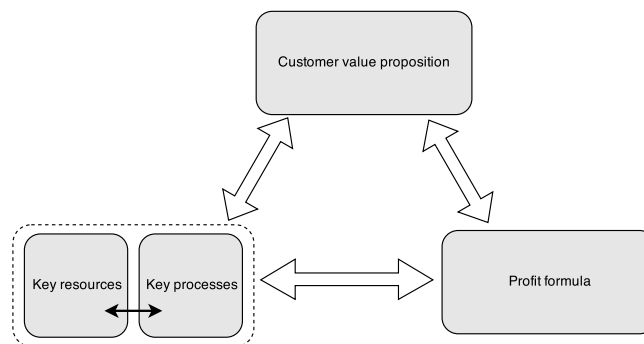


Figure 14: The four interlocking business model elements of a successful business model (referring to Johnson, 2010, p. 24)

customers, the company itself and their interaction. The *key processes* encompass operational and managerial processes, which create value, can be repeated and increase in scale. *Rules and metrics* (e.g. lead times) as well as *norms* (e.g. approach to customers and channels) are also integrated into key processes. Johnson et al. (2008, p. 52) emphasize that the power of the business model rests in the *complex interdependency* between the elements; a business is successful if the elements fit each other. (Johnson et al., 2008, p. 52pp; Johnson, 2010, p. 24pp)

What was observed from these two definitions is first of all the number of elements described – Osterwalder and Pigneur (2010, p. 16p) described 9 elements and Johnson et al. (2008, p. 54) four. Besides this, they also distinguish between the main or core element in the business model. Johnson et al. (2008, p. 54) see the value proposition as the heart of the business model, whereas Osterwalder and Pigneur (2010, p. 16pp) see the customer as the main component. Thus, the definition of the business model and determination of the importance of single elements depends on the respective viewer of the BM. The important aspect is that all elements suit and fit each other.

Based on the systemic view of this work, consideration of the BM consisting of different

elements that influence each other and have to be aligned seems appropriate for this research and the rest of this thesis. Past research also took an explicitly systemic view of the BM. For example, Zollenkop (2006, p. 47) describes the BM as a *system* consisting of different elements which are related to each other. This relation exists not only between business model elements, but also within the environment. In addition, Halecker and Hartmann (2013, p. 3) explained that business models are dynamic and change over time, they are complex and are models of firms that can be considered as open and social systems; this implies that systems thinking is appropriate for business models.

As a lot of existing BM definitions explain the BM in the form of elements; the following section determines the main elements identified in the literature and describes them in more detail.

4.2 Elements of a Business Model

In order to identify the main elements of a BM, several publications in the form of papers and books defining and describing the business model were analyzed. As nearly every researcher uses his/her own words to describe and designate the BM elements, the author of this thesis took the most commonly used terms to denote the respective elements in table 6. The elements identified are further aggregated due to the different granularities describing a BM. Several sub-elements applying to the aggregated element are mentioned as well. Table 6 illustrates the main elements, synonyms of elements and sub-elements used in the literature to define a business model.

The definitions analyzed showed that the predominant goal of a business or business model is *value creation for the customer*. This was also observed in the designation of business model elements. But what does *value* actually mean? There are different understandings available. Value is seen as *price*, but it is also used in the sense of *costs*. In addition, value is also used in the context of *high quality* or *transactions as a good deal*. Rose (1994, p. 12) defines value as “*the satisfaction of customer requirements at the lowest total cost of acquisition, ownership and use.*” The goal of a value-based business model is described by Bieger and Reinhold (2011, p. 32) as the monetary and non-monetary value creation for all stakeholders of the company and the company itself. Here, it is important that the value provided is perceived and acknowledged by the customer. However, value is a relative perception, where competition is also a factor in the assessment of value by the customer. (Rose, 1994, 16p)

Following a presentation of the business model elements and their representatives in table 6, the BM elements identified are described in more detail.

Business model element	Sub-element and synonyms	Representatives
Customer	<ul style="list-style-type: none"> - Customer segments, target customer; - Channels, value communication and transfer, distribution - Customer relationship 	<p>Mahadevan (2000); Stewart and Zhao (2000); Hamel (2001); Linder and Cantrell (2001); Petrovic et al. (2001); Chesbrough and Rosenbloom (2002); Hedman and Kalling (2003); Pateli and Giaglis (2003); Mitchell and Coles (2004b); Morris et al. (2005); Osterwalder (2004); Yip (2004); Osterwalder and Pigneur (2005); Richardson (2008); Shafer et al. (2005); Tikkanen et al. (2005); Kallio et al. (2006); Chesbrough (2007); Skarzynski and Gibson (2008); Björkdahl (2009); Nenonen and Storbacka (2010); Giesen et al. (2010); Osterwalder and Pigneur (2010); Wirtz et al. (2010); Bieger and Reinhold (2011); Lindgren and Taran (2011); Habtay (2012); Sinfield et al. (2012); Tsvetkova and Gustafsson (2012); Abdelkafi et al. (2013); Baden-Fuller and Haefliger (2013); Gassmann et al. (2013)</p>
Value Proposition	<ul style="list-style-type: none"> - Products - Services - (Market) Offering, customer value 	<p>Visicio and Pasternack (1996); Timmers (1998); Mahadevan (2000); Amit and Zott (2001); Linder and Cantrell (2001); Petrovic et al. (2001); Chesbrough and Rosenbloom (2002); Stähler (2002); Bouwman (2003); Hedman and Kalling (2003); Kar et al. (2003); Pateli and Giaglis (2003); Osterwalder (2004); Yip (2004); Kijl et al. (2005); Morris et al. (2005); Osterwalder and Pigneur (2005); Richardson (2008); Shafer et al. (2005); Tikkanen et al. (2005); Voelpel et al. (2005); Kallio et al. (2006); Chesbrough (2007); Halme et al. (2007); Johnson et al. (2008); Konde (2008); Skarzynski and Gibson (2008); Björkdahl (2009); Lindgardt et al. (2009); Giesen et al. (2010); Osterwalder and Pigneur (2010); Wirtz et al. (2010); Bieger and Reinhold (2011); Lindgren and Taran (2011); Mason and Spring (2011); Storbacka and Nenonen (2011); Habtay (2012); Lee et al. (2012); Sinfield et al. (2012); Tsvetkova and Gustafsson (2012); Abdelkafi et al. (2013); Baden-Fuller and Haefliger (2013); Gassmann et al. (2013)</p>

Business model element	Sub-element and synonyms	Representatives
Value Creation	<ul style="list-style-type: none"> - Resources and capabilities, core competencies - Activities and processes, set of activities, linkages, transactions and relationships - Value configuration, value (chain) constellation, network model/structure, partner model, key partners 	<p>Visicio and Pasternack (1996); Timmers (1998); Stewart and Zhao (2000); Amit and Zott (2001); Hamel (2001); Petrovic et al. (2001); Storbacka and Nenonen (2011); Betz (2002); Chesbrough and Rosenbloom (2002); Magretta (2002); Stähler (2002); Bouwman (2003); Hedman and Kalling (2003); Kar et al. (2003); Pateli and Giaglis (2003); Hoppe and Breitner (2004); Kijl et al. (2005); Osterwalder (2004); Yip (2004); Morris et al. (2005); Osterwalder and Pigneur (2005); Richardson (2008); Schweizer (2005); Shafer et al. (2005); Tikkanen et al. (2005); Voelpel et al. (2005); Kallio et al. (2006); Chesbrough (2007); Halme et al. (2007); Johnson et al. (2008); Konde (2008); Mason and Leek (2008); Skarzynski and Gibson (2008); Björkdahl (2009); Lindgardt et al. (2009); Nenonen and Storbacka (2010); Santos et al. (2009); Giesen et al. (2010); Onetti et al. (2010); Osterwalder and Pigneur (2010); Wirtz et al. (2010); Bieger and Reinhold (2011); Lindgren and Taran (2011); Mason and Spring (2011); Habtay (2012); Lee et al. (2012); Sinfield et al. (2012); Tsvetkova and Gustafsson (2012); Abdelkafi et al. (2013); Baden-Fuller and Haefliger (2013); Gassmann et al. (2013)</p>
Value Capture	<ul style="list-style-type: none"> - Costs - Revenues, revenue generation, revenue model - Profits, profit model/formula - Asset model, finance model, value dissemination, pricing model 	<p>Timmers (1998); Mahadevan (2000); Linder and Cantrell (2001); Petrovic et al. (2001); Betz (2002); Chesbrough and Rosenbloom (2002); Stähler (2002); Bouwman (2003); Hedman and Kalling (2003); Kar et al. (2003); Pateli and Giaglis (2003); Osterwalder (2004); Kijl et al. (2005); Morris et al. (2005); Osterwalder and Pigneur (2005); Richardson (2008); Schweizer (2005); Shafer et al. (2005); Tikkanen et al. (2005); Voelpel et al. (2005); Kallio et al. (2006); Chesbrough (2007); Halme et al. (2007); Johnson et al. (2008); Konde (2008); Skarzynski and Gibson (2008); Björkdahl (2009); Lindgardt et al. (2009); Stewart and Zhao (2000); Giesen et al. (2010); Osterwalder and Pigneur (2010); Wirtz et al. (2010); Bieger and Reinhold (2011); Lindgren and Taran (2011); Habtay (2012); Sinfield et al. (2012); Tsvetkova and Gustafsson (2012); Abdelkafi et al. (2013); Baden-Fuller and Haefliger (2013); Gassmann et al. (2013)</p>

Table 6: Business model elements and their representatives

4.2.1 The Customer

All elements outside the company (e.g. market segment, customer relationship, market segment) are part of the *external perspective* and lie with the customer (Gassmann et al., 2011, p. 198). For Stähler (2002, p. 45), customers are part of the value creation architecture, the external architecture of the business model. Osterwalder and Pigneur (2010, p. 20), Hamel (2001, p. 100) or Stähler (2002, p. 45) speak about the *customer interface*, consisting of the customer and different customer segments, respectively, as well as channels through which to reach customers and also the customer relationship.

Customers are the heart and the focus of every business model (Gassmann et al., 2013, p. 6) because it is the customers that help companies to generate profits. In order to respond better to customer needs, customers are segmented according to specific target groups. Customer segmentation can be conducted on the basis of their specific offers, the distribution channels or existing relationships. If the BM targets a mass market, customer segmentation is not necessary because the value proposition, channels and relationships target the same group. In comparison, if the BM targets niche markets, every niche conforms to a specific customer segment with different value propositions, channels and relationships. (Afuah, 2003, p. 75; Osterwalder and Pigneur, 2010, p. 20p; Wirtz, 2011a, p. 136)

The company uses *channels* to establish contact with the customer. Channels are necessary for communication between the customer and the company, or are important distribution or sales channels. The goal of a channel is to arouse the customer's attention, deliver the value proposition to the customer or provide after-sales services. Communication channels are important for establishing a long-term relationship with the customer. With the support of ICT, communication with customers can also be achieved via different platforms. Companies can have a broad mix of channels to reach the customer, for example through a channel owned by the customer or a partner organization. In addition, the company can contact the customer directly through its sales force, web sales or indirectly through partner stores or wholesalers. Choosing the right mix of channels is crucial to achieving maximum revenues. (Hamel, 2001, p. 100pp; Osterwalder and Pigneur, 2010, p. 26p; Bieger and Reinhold, 2011, p. 42pp)

Customer relationships are important for staying in contact with the customer. There are different possibilities in this field that vary in their intensity and between customer segments. Relationships can take several forms (see section 3.3.2), and besides the business aspects, emotional elements are also available and help to distinguish the BM used. A very intensive form of relationship is *co-creation*, where the customer takes an active part in value creation. As a partner in value creation, the customer is also responsible to some extent for the value proposition. (Hamel, 2001, p. 100pp; Osterwalder and Pigneur, 2010, p. 28p; Bieger and Reinhold, 2011, p. 43p; Wirtz, 2011a, p. 136)

4.2.2 Value Proposition

The value proposition is the key to a successful business model, defining which values are created for which customers and customer segments and also their specific problems and needs. This value created for the customer is the reason why the customer turns to the company. Besides the customer, Stähler (2002, p. 42) describes value creation partners as stakeholders of the value proposition because the value proposition also includes the value of participating in the business model and hence, constitutes a motivation for participation. In order to be able to develop the value proposition, the *job-to-be-done* must be clear. Johnson (2010, p. 26p) stated that, in addition to understanding customer needs, which only refer to existing products and services, it is also essential that the *job-to-be-done* is also clear because this understanding provides the basis for new offerings. In order to identify an important *job-to-be-done*, the company must be proactive and pursue an outside-in approach by actively listening to customers. If the *job-to-be-done* is fully understood, the respective offering can then be designed. The values provided may be tangible or intangible products as well as services, or a combination of the two⁴⁶; values can also be of a quantitative (e.g. price) or qualitative (e.g. customer experience) nature. Thus, the value proposition includes not only single products; integrated value systems can also solve relevant customer problems. In summary, this defines a bundle of benefits that the company offers to the customer. Osterwalder and Pigneur (2010, p. 22pp) describe different factors contributing to value creation. For example, the *newness* of the value proposition can satisfy customer needs in a way that was not possible before. *Customization* can also contribute to value proposition, as customers or customer segments participate in value creation through co-creation. Additional factors influencing the value proposition are, for example, performance, design, price, brand/status, cost reduction, accessibility, risk reduction and convenience/usability. Customers sometimes value the *buying experience*, i.e. the way the offering is sold, more than the offering itself. For companies, a clear definition of the value proposition is important; the more clearly the value proposition is defined, the better the business model can be understood. With a clear definition of the value proposition, the company also implies what it is *not* doing. (Stähler, 2002, p. 43; Johnson, 2010, p. 22pp; Osterwalder and Pigneur, 2010, p. 22pp; Bieger and Reinhold, 2011, p. 32pp)

Baden-Fuller and Haefliger (2013, p. 421) distinguish between *project-based offerings* and *pre-designed (scale)-based offerings*. Project-based offerings are tailor-made for a specific customer need. Processes in such business have to deal with complex tasks that have to be repeated, be able to respond flexibly to changing customer needs and must integrate different sources of knowledge. In comparison, a business model dealing with pre-designed offerings is characterized by products manufactured by machines and processes that are scale-based and only have little flexibility to react to changing customer needs. Different bodies of knowledge in such models are normally integrated through different processes. Examples of such a business

⁴⁶These combinations are called hybrid bundles of value or product-service systems and combine products and services to fulfill customer needs (Barquet et al., 2013, p. 694).

model are large fast-food chains like McDonalds.

4.2.3 Value Creation

In general, value creation can mean two things: the *added value* from the point of view of the customer or the *process of adding value* to every single activity performed. Decisions on the depth of value added are important for the structure and the competitive position of the company as well as the development of the company in the future. (Zollenkop, 2006, p. 56) Value creation defines how the value proposition is delivered to the customer, what position the company embodies in the value creation, who are important partners and how transactions take place in the company. Depending on the configuration of the value creation, the company has to decide how external resources and competencies are integrated, for example through buying on the market, cooperation or strategic alliances. The different ways and intensities with which companies can work together with partners in the network were already discussed in section 3.3.2.1. (Bieger and Reinhold, 2011, p. 38pp) Stähler (2002, p. 43pp) distinguishes between the *internal and external architecture* of value creation. The internal architecture is responsible for creating the offering and fulfilling the value proposition. It consists of resources⁴⁷, the steps of creating value⁴⁸, as well as communication channels and coordination mechanisms⁴⁹. The company also needs to decide which parts of value creation are conducted internally or are assigned to external partners. The external architecture defines the interface to the customer and value creation partners⁵⁰ of the company. The interface to the customer in the form of channels and relationships are seen as part of value creation, but are usually related to the customer element in the business model. Partners can be either active or passive, where passive partners may offer complementary products that are necessary for the business model to work. Communication channels and coordination mechanisms define rules between partners.

The configuration of the value chain has to be considered in relation to specializing in several activities in the value chain. It can be described as the *value creation structure* of a company, the activities performed in-house and externally, as well as the composition of activities in and between different locations of the company. Regarding the *depth of value creation*, the company can decide between the continuum of market and hierarchy; in the hierarchy, the company mainly outsources activities and in the market, the highest possible vertical integration is pursued. (Zollenkop, 2006, p. 59) An important issue therefore is the core competencies and

⁴⁷Resources consist of core competencies and strategic assets like brands, patents or knowledge (Stähler, 2002, p. 44).

⁴⁸The steps in value creation integrate resources, the sequence of these activities, and which actors and roles participate (Stähler, 2002, p. 44).

⁴⁹The communication channels and coordination mechanisms describe the linkages between the activities and the roles. This defines the core processes of the company. (Stähler, 2002, p. 44p)

⁵⁰For example suppliers, companies offering complementary products, customers or competitors (Stähler, 2002, p. 45p).

the securing of know-how in the company. Core competencies are resources and capabilities that are crucial for the success of the company. By knowing these core competencies, the value creation activities that can be fulfilled better by the company than by competitors can be determined. (Hungenberg, 2011, p. 148) Additional strategic issues in deciding on the depth of value creation are the characteristics of the product⁵¹, process-related characteristics⁵² and external issues⁵³. For the business model design, four different value creation models are presented in the literature (Schweizer, 2005, p. 41) based on the descriptions by Heuskel (1999) (see also figure 15). They span a continuum from entirely vertically integrated companies to specialized ones. In between, companies operate in networks coordinating different value creation steps. Very often, companies do not choose one form; they mix these models in some way, but a clear distinction should be discernible. In the following, the four models are explained briefly (Heuskel, 1999, p.57pp; Meinhardt, 2002, 17f; Schweizer, 2005, p. 43ff; Zollenkop, 2006, p. 60ff):

- *Integrated Model*: Companies pursuing the integrated model cover the complete value chain; the company works as a *vertically integrated* company. A high revenue potential arises due to cost or differentiation advantages. However, this requires excellent performance by the integrator in every step of the value chain. Companies choose this model, for example, very early in the innovation process, where the transaction costs of obtaining it externally would be too high. Established companies or branch leaders also choose this form of value creation configuration.
- *Orchestrator Model*: If the company decides to outsource steps in the value chain that are not their core competency, they use the orchestrator model. Usually, they incorporate only one or a few core steps and all others are outsourced. Companies using an orchestrator model coordinate the value creation of other companies to a coherent end product and have to establish a value creation network for this. Furthermore, the companies have to establish excellent coordinator capabilities in order to coordinate the various suppliers in the value chain, but this provides high revenue potentials. The pre-requisite for success is choosing the right partners and integrating a “best-of-everything” company. The added value of the orchestrator very often lies in the brand and the reputation it provides or the development of innovative products. The orchestrator is very common in the consumer industry. For example Adidas, a manufacturer of sports equipment, detached the entire manufacturing process and concentrates on strengthening the brand, sales and delivery.
- *Market Maker Model*: Companies operating as market makers, also called *pioneers*, mainly provide information to other companies or customers in the value chain. They

⁵¹Especially the standardization of a module or product determines the risks of purchasing a product outside (Zollenkop, 2006, p. 60).

⁵²How steps relate to other value creation steps (e.g. machines used together) (Zollenkop, 2006, p. 60).

⁵³Characteristics relating to the market, indicators relating to suppliers and competitors (Zollenkop, 2006, p. 61).

should help customers to navigate through this huge amount of information available and find the best offering. Thus, an additional value creation step is added – *intermediation* – enabling a new combination between different value creation steps and value chains or systems. The tasks of the market maker are to take information on value creation participants, bundle these activities on a platform and operate as infomediary in a network of value creation relationships. Here, the market maker takes on the role of coordinator, navigator or as a kind of broker. Changes in market stability and deconstruction of the value chain provide new chances for the market maker, for example acting as an interface between value creation activities. The online auction platform eBay is a company operating as a market maker.

- *Layer Player Model*: If a company specializes in one specific step in the value chain, it operates in the layer player model. The impact of companies using a layer player model is tremendous because specializing on specific layers in the value chain can change the industry and market power. In this model, the company specializes in specific steps in value creation and offers this created value in different branches. It is important that value creation takes place independently of other value creation steps, that it can be transferred, and that it also enables a sustainable, competitive basis. A description of interfaces for easy integration of other value creation activities is, therefore, required. The advantages of this model are the possibilities of economies of scale and know-how advantages as a result of specialization and risk reduction. Drivers of this model are OEMs focusing on their core competencies and outsourcing several activities to such specialists. This model is found especially in the electronics industry, the pharmaceutical industry and the automobile industry.

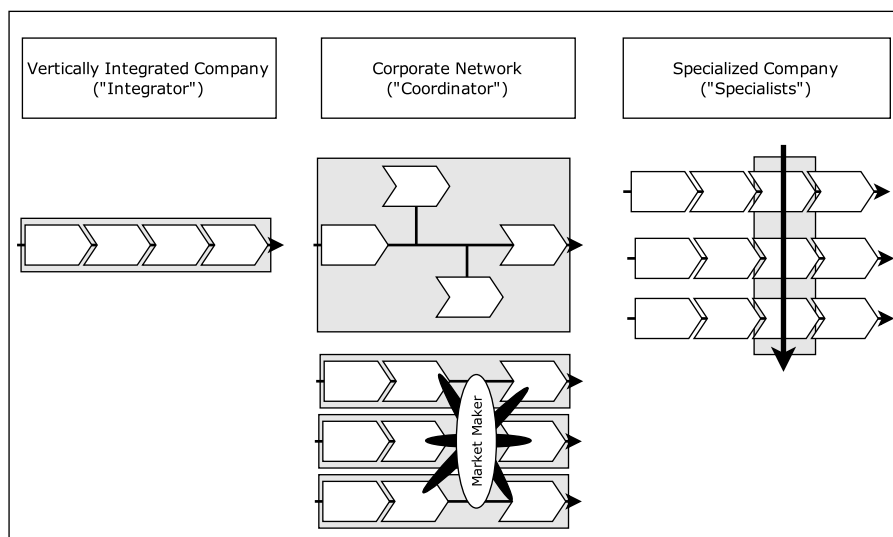


Figure 15: Configurations of value creation (referring to Meinhardt, 2002, p. 17; translated by the author)

These value creation models can be related to business ecosystem strategies explained in section 3.3.1. The orchestrator model correlates with the keystone strategy by coordinating value creation activities. Also, the market maker can be related to the keystone by providing information and coordinating. The layer player is similar to the niche strategy in concentrating on its own core competencies. The integrator is somehow related to the dominator strategy in the business ecosystem, although the descriptions of the integrator do not show hostile intentions in the same way as the dominator does.

In order to visualize value creation, Porter's value chain (Porter, 1985, p. 37) is normally used (see figure 16). Porter (1985, p. 38p) divides value activities according to two types of activities – *primary activities*⁵⁴, which are directly related to value creation, and *secondary activities*⁵⁵, which establish preconditions for the accomplishment of primary activities. The margin, explained as growth of the value, is designated separately at the end of the chain. The comparison of value chains helps to identify those activities that add value and provide transparency according to differences in the value creation of competitors. The value chain of a company cannot be seen in isolation; instead it is intertwined with and integrated into the value chains of suppliers, customers or competitors constituting a *value system*⁵⁶ (Porter, 1985, p. 34). (Zollenkop, 2006, p. 56pp)

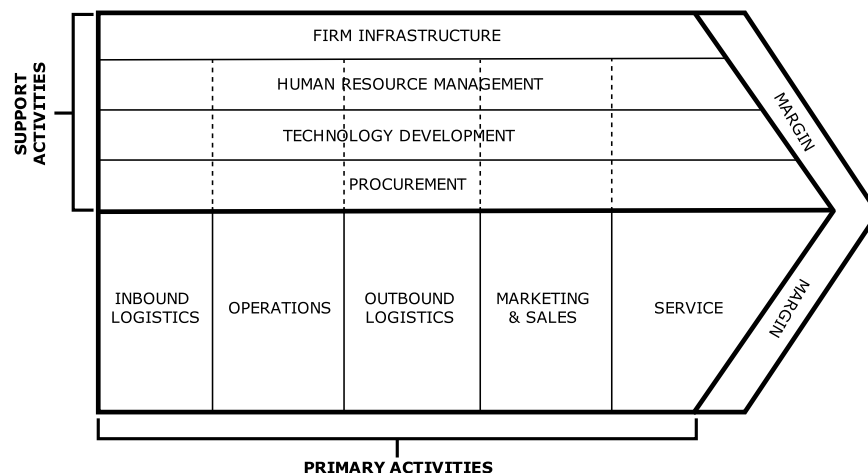


Figure 16: The generic value chain (referring to Porter, 1985, p. 37)

Zollenkop (2006, p. 58), therefore, proposes working in *value creation partnerships*, where two companies in subsequent value chain steps work cooperatively or in *value creation networks* as

⁵⁴Primary activities consist of inbound logistics, operations, outbound logistics, marketing and sales and service (Porter, 1985, p. 39p).

⁵⁵Secondary activities consist of company infrastructure, human resource management, technology development, and procurement (Porter, 1985, p. 40pp).

⁵⁶Möller et al. (2005, p. 1276pp) describe a value system in the form of *strategic networks*. The goal of such a strategic network is to increase the operative efficiency of an existing value system, innovate products or processes or develop a new business, which requires several new value activities or a complete new value system.

the linkage between several value creation partnerships. Normann and Ramírez (1993, p. 69) as well as Hearn and Pace (2006, p. 58p) propose departing from creating value in sequential chains and moving towards creating value in *constellations*, taking place simultaneously. The *value constellation* was coined by Normann and Ramírez (1993, p. 65pp), showing a network-based value creation model consisting of relationships between external and internal actors (Wirtz, 2011a, p. 92). This concept presents the idea of a new value creation logic, where different partners together *co-produce* value. Thus, roles and relationships in this constellation are reconfigured to create new forms of value by new players. The focus in this model is not value creation for the customer, but mobilizing customers to create value for themselves by using the vast range of information, knowledge and resources. Customers develop from mere consumers to become a *value co-creator or co-producer*. In this way, they become the center of value creation and are able to influence the *where, when and how* of value creation. The value no longer lies in the product itself, but in the experience of co-creating it. (Hearn and Pace, 2006, p. 58p) Besides the customer, companies also co-create value together with other companies because the creation of complex and varied products becomes increasingly difficult for a single company. A competitive advantage is, therefore, generated by making this value-creating system work. Companies can create more value not only by making more intelligent offerings, but also more intelligent customers and suppliers through a steady reassessment and re-design of competencies and relationships. (Normann and Ramírez, 1993, p. 69) This leads to a value creation system as a *business ecosystem*, as described in chapter 3. Also in the business ecosystem, value is not merely added at each step in the chain; instead, different participants “*work together to create a new value for the customer through an integrated, seamless offering that extends each of their capabilities*”. The business ecosystem also specially emphasizes working together with competitors and complementors, which is not considered in the value chain. (Gossain and Kandiah, 1998, p. 31) As market conditions change or new opportunities appear because of new possibilities to co-create value, the business model changes. (Romero and Molina, 2009, p. 402p) In this context, Chesbrough (2006, p. 2p) explains the necessity to open up the company’s boundaries and their business model, respectively, by implementing an *open business model*.

Crucial to working together successfully with partners is the choice of the best partner, because not all are suitable for value co-creation. The role of every single partner depends on the complementary competencies contributed, in the form of resources, knowledge, skills or expertise. The common goals and interests of working together should be clarified⁵⁷. (Romero and Molina, 2009, p. 403p)

⁵⁷Possible ways of working together and relationships between partners were explained in section 3.3.2.

4.2.4 Value Capture

The ultimate goal of the company is to earn money with their BM. As a result, revenue generation is an important part of the BM; the corresponding framework for this is the *revenue model*. Different sources of revenues help companies to better target their customers and formulate the revenue model in a better way. (Afuah, 2003, p. 81) The term *value capture* is frequently used in order to describe revenue generation in the BM (Wirtz, 2011a, p. 141). Value capture takes place on two levels – capturing value from the customer and capturing value from the company. In order to receive cash from the customer or customer segments, the company generates different revenue streams and chooses the right channels for this. A precondition for capturing the customer value is the *willingness of the customer to pay for the value*. The revenue generated consists of the simple formula *price x volume*, depending on whether the company operates in a mass or niche market⁵⁸. (Osterwalder and Pigneur, 2010, p. 30; Bieger and Reinhold, 2011, p. 46p) Johnson (2010, p. 31pp) uses a *profit formula* to define the value capture. The profit formula describes the value capture for the company and its shareholders, the assets and costs involved and necessary margins and “resource velocity” for covering costs.

Together with revenue streams, the costs of operating a business model need to be considered as well (e.g. creating and delivering the value; costs for the customer relationships) (Osterwalder and Pigneur, 2010, p. 40p). The cost structure consists of overhead costs and direct costs. The target for the unit margin is defined through the profit generated per unit and needed to cover the overhead costs and reach the profit level at the targeted volume. (Johnson, 2010, p. 31pp) In general, business models are either cost-driven or value-driven. A *cost-driven* BM has the goal of minimizing costs as much as possible; no-frills airlines are an example of companies where costs are the most important factor. *Value-driven* business models focus on value creation, where a premium value proposition and individualization are the most important factors. The revenue model thus depends on the strategy chosen. (Johnson, 2010, p. 35; Osterwalder and Pigneur, 2010, p. 40p; Wirtz, 2011a, p. 141)

There are different ways of configuring the value capture (see figure 17). In general, revenues can be generated by main or by supplementary accomplishments. Furthermore, revenue streams can also vary in their pricing mechanisms (e.g. charging of products and services in the form of flat-rate, individual or combined). Revenues, prices and payment modes can vary and need to be configured according to customers and customer segments, respectively. (Hamel, 2001, p. 105; Bieger and Reinhold, 2011, p. 47p; Wirtz, 2011a, p. 142)

Capturing the company value can be defined over the discounted free cash flow method. This takes place through the capture of customer value and the free cash flow received per

⁵⁸A company in the mass markets will have a high volume for low prices. In comparison, a company in a niche will have a lower volume for a higher price. (Bieger and Reinhold, 2011, p. 47)

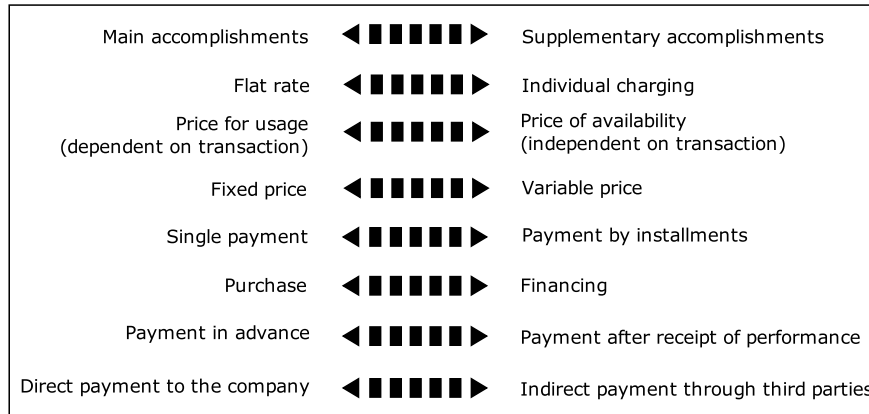


Figure 17: Possible configurations of the revenue model (referring to Bieger and Reinhold, 2011, p. 47; translated by the author)

customer. The value creation for the whole company can be realized by multiplying the business model⁵⁹ or by disposing of parts of the company. (Bieger and Reinhold, 2011, p. 48) Besides capturing value through customers and the company itself, suppliers and other stakeholders also integrated in the value creation need to be considered, as figure 18 shows. Bieger and Reinhold (2011, p. 49) describes this as *value dissemination* in the business model. They enlarge the group of stakeholders towards all network partners of the company playing a role in value creation; this makes value dissemination more complex. The goal of the company, however, is to maximize its own value capture. (Bieger and Reinhold, 2011, p. 49p; Wirtz, 2011a, p. 142)

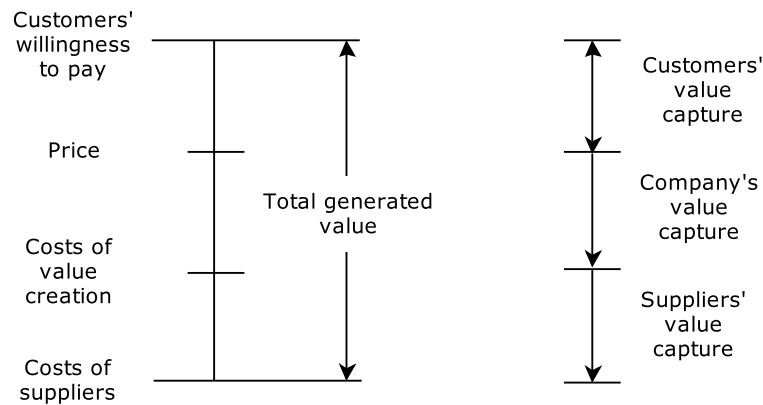


Figure 18: Value dissemination in the business model (referring to Wirtz, 2011a, p. 142; translated by the author)

⁵⁹E.g. in a franchising system or through enlargement of the brand (Bieger and Reinhold, 2011, p. 48).

4.2.5 Business Model Elements and their Interrelations

The systems theory explains that elements in a system are connected through relationships between other elements and the environment. In the business model, the relation between business model elements is determined by their interactions (Wirtz, 2011a, p. 176). The inter-relationship between the BM elements becomes visible through *cause-and-effect-relationships* (Hedman and Kalling, 2003, p. 53; Zollenkop, 2006, p. 47; Wirtz, 2011a, p. 157). According to Johnson (2010, p. 25), the power of the business model resides within the *interdependencies* of business model elements. The success of the business model is determined by a stable system “*in which these elements interact in consistent and complementary ways.*” Through this relationship, changes taking place in one element influence other elements in the BM (see section 7.3 and section 9.1.3). Eurich et al. (2014, p. 332) argue that *networked thinking* is required in designing a business model in order to understand the interdependencies in the BM. Thus, they refer to Vester (1999) and systems thinking in order to understand that changes in one element of a system influence the other elements as well. In order to highlight these interrelationships, Eurich et al. (2014, p. 335p) suggest using a *causal loop diagram*. As a result, not only relationships between elements, but also relationships with the environment (Zollenkop, 2006, p. 47p; Eurich et al., 2014, p. 32) become visible. These relationships are necessary to establish a *fit* (Ballon, 2007, p. 8; Giesen et al., 2009, p. 9; Nenonen and Storbacka, 2010, p. 51p) or *alignment* between the elements in order to “*construct, differentiate and assess business models*” (Ballon, 2007, p. 8). The *internal fit* should provide internal consistency between business model elements (Ballon, 2007, p. 8; Giesen et al., 2009, p. 9; Nenonen and Storbacka, 2010, p. 51p); whereas the *external fit* describes the fit between the business model of the company and the customer (Nenonen and Storbacka, 2010, p. 9). The external fit should, therefore, also provide value to the customer and secure a competitive position for the company (Zollenkop, 2006, p. 90).

Zollenkop (2006, p. 85p) states that *compatibility* and *complementarity* are important determinants for the fit of the business model. Compatibility means that elements fit each other at their interfaces; it is the ability of these elements to achieve functional integration. Complementarity means that sub-functions of elements or modules are added for the functionality of the whole. The business model is only balanced and can fulfill the required function if all elements of the business model are compatible and complementary.

Casadesus-Masanell and Ricart (2011, p. 102p) define business models according to *choices*⁶⁰ of actions taken and *consequences* of these choices⁶¹, influencing value creation and value capture. They further explain that business models need to be *aligned with company goals, self-reinforcing and robust*. The establishment of a balanced and aligned business model is

⁶⁰Policy choices, asset choices or governance choices (Casadesus-Masanell and Ricart, 2011, p. 103).

⁶¹Consequences are flexible if the company responds quickly; consequences are rigid if changes are hard to imitate because of the time needed for realization (Casadesus-Masanell and Ricart, 2011, p. 103).

described in several ways, mainly in the context of designing a BM. The determining factors, as explained by Wirtz (2011a, p. 176pp), are strategic decisions made by the top management. This has a direct influence on the design of the customer element, the value proposition and value creation and determines how the BM operates in the market and how it differs in relation to competitors. At the same time, results of and information on the value proposition and the customer are again the basis for strategic decisions. Value capture and procurement are influenced indirectly by the strategy. By using the business model, the feedback of all participants in the business model can be used to make improvements. Figure 19 visualizes these relationships. Another way of establishing a BM fit is described by Zollenkop (2006, p. 88): The chosen form of value creation in terms of value creation depth, value creation partners and core competencies needs to be compatible with the business field of the company (e.g. form of products and markets). The products and services offered must have a suitable revenue stream, consisting of price, willingness to pay, types of revenue, and so on. Eyring et al. (2011, p. 92p) depict the value proposition of the customer as the determining factor in development of the BM. If the goal of the business model is competition based on differentiation, resources and processes have to be designed afterwards, followed by costs determining the price of the value proposition. If the business model competes based on prices, the price of the offering is determined before resources and processes are defined. The competitive advantage lies in the integration of all elements and the value creation for customers and the company. Establishing a fit of all BM elements from the resource-based point of view is explained by Demil and Lecocq (2010, p. 234). From this perspective, resources and competencies determine the value proposition and the internal and external organization. The volume and structure of revenues and costs are determined on this basis. All this together determines the sustainability of the business model, and the interactions and dynamics *within*⁶² and *between*⁶³ BM elements explain the dynamics of the business model. Also, Osterwalder (2004, p. 95) defines in his value ontology how single elements of the business model relate to each other. In his view, especially value creation, value proposition and the customer element are interrelated. The financial model is influenced by all other elements and is the “*outcome of the rest of the business model's configuration*”. The same thing is emphasized by Meinhardt (2002, p. 30), where the revenue stream is determined by the value proposition as well as the value creation mechanisms and related costs. The majority of explanations provided above treat the financial model as a consequence of choices made in the other elements of the business model.

⁶²If one component changes, other elements in the same component may change as well. For example, changes in the value proposition may create opportunities for an additional value proposition. (Demil and Lecocq, 2010, p. 234)

⁶³For example, development in resources or competencies may lead to changes in the organizational structure (Demil and Lecocq, 2010, p. 234).

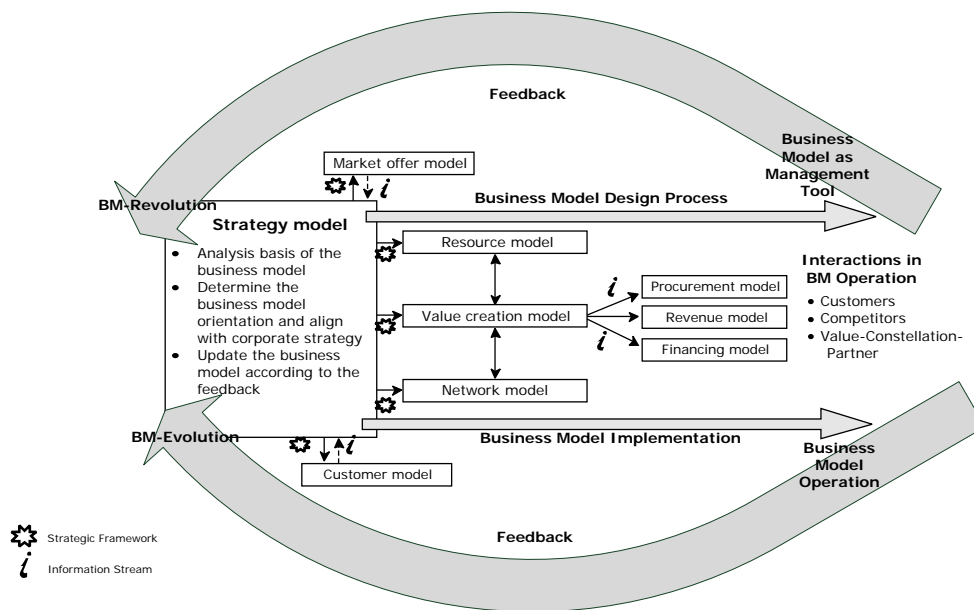


Figure 19: Interactions in the business model (referring to Wirtz, 2011a, p. 177; translated by the author)

4.3 Business Models at different Hierarchies in the Organization

Business models are not only defined in different aggregation levels (see section 4.1.2), they are also described at different hierarchy levels in the company and industry, with a rising level of detail. Linder and Cantrell (2000, p. 2) distinguish between *components of business models*, *operating business models* and *change models*. Components of business models are only pieces of one BM, like the revenue model, and are comparable to the elements of a BM. In the literature, sometimes only single elements are used to describe the BM, although this is not the entire BM. Operating business models are real business models explaining how a company creates value and earns money. In comparison, change models explain the logic of a firm and how it will change in a dynamic environment. Assets, capabilities, relationships and knowledge created by the operating model are extended and leveraged by the change model.

A *hierarchy of business models* is illustrated by Osterwalder and Pigneur (2005, p. 9pp) and by Wirtz (2011a, p. 73pp). Osterwalder and Pigneur (2005, p. 9pp) explain that the BM and all aspects belonging to the BM are defined on the first level, resulting in a *meta-model* conceptualizing the BM as an abstract concept. The next level defines *taxonomies* of business models that are still meta-models, but share some common characteristics. These taxonomies are normally not specific business models of a company, but of specific industries. The *instance level* includes concrete, real-world business models. In contrast to Osterwalder and

4.3 Business Models at different Hierarchies in the Organization

Pigneur (2005), Wirtz (2011a, p. 73pp) defines four business model levels. At *industry level*, the focus lies on the offerings in an industry, considering environmental and external factors. Subsequently, the *corporate BM* focuses on company-internal factors, like resources or activities. Business models for *business units* are the third level. Diversified companies performing many activities that differ from each other need to define business models at the business unit level. The lowest level, the *product level*, highlights relevant processes and elements defining a BM for a specific product.

Schallmo and Brecht (2010, p. 6p) took those levels and structured them according to *generic and specific business model levels*, as shown in figure 20. The generic level describes abstract business models and is divided into two sub-levels: the abstract level and the industry level. The *abstract level* includes different types of abstract models and can be compared to the meta-models explained by Osterwalder and Pigneur (2005, p. 9pp). Like the components defined by Linder and Cantrell (2000, p. 2), the elements are flexible (they can be changed) within an option space (existing options can be selected). The *industry level* is similar to the description by Wirtz (2011a, p. 73pp) and the taxonomies of Osterwalder and Pigneur (2005, p. 9pp). Elements in this model are also flexible, with an available option space, and present how a company can operate in an industry. Taxonomies provide ideas and options for companies when developing the BM. This leads to the specific level at which concrete business models of companies are positioned. The specific level distinguishes between the corporate level, the business unit level, and the product and service level. The *corporate level* describes real business models of companies, as also defined by Linder and Cantrell (2000, p. 2), Osterwalder and Pigneur (2005, p. 9pp) and Wirtz (2011a, p. 73pp). As these are descriptions of how companies operate, the elements described are fixed. On the *business unit level*, BM elements are also fixed and used for companies operating in different business fields or countries (e.g. description by Wirtz (2011a, p. 73pp) of business unit models). The *product and service level* defines business models for a specific product or service (e.g. Wirtz (2011a, p. 73pp)).

Level	Name	Scheme	Characteristics
Generic	1 Abstract level: abstract business model types	Abstract Business Model Types	<ul style="list-style-type: none"> Defined independently from industries Option space of elements General principle how to operate
	2 Industry level: industry business model types	Industry Business Model Types	<ul style="list-style-type: none"> Defined for an industry Option space of elements Principle how to operate in an industry Examples: e-business models
Specific	3 Corporate level: corporate business model	Corporate Business Model	<ul style="list-style-type: none"> Defined for corporate businesses Fixed elements Description of corporate business operating Examples: Coca-Cola, Dell
	4 Business unit level: business unit model	Business Unit Model	<ul style="list-style-type: none"> Defined for business units of a corporate business Fixed elements Description of business unit operating
	5 Product and service level: product and service business model	Product & Service Business Model	<ul style="list-style-type: none"> Defined for a specific product or service Fixed elements Description of product/service operating Examples: car2go

Figure 20: Business model levels (referring to Schallmo and Brecht, 2010, p. 7)

Chapter 5

Changing the Business Model

As already presented in the introduction (section 1.1), shorter product and technology life cycles or changing customer needs require a company to innovate and change. In the past few decades, companies met these changes with product and process innovations; within the past few years, companies have tended to focus on innovations in their business models, which also led competitors to look at business models (Hamel, 2001, p. 83p). To gain a differentiated competitive advantage, technological innovation often goes hand in hand with business model innovation, which may also lead to the creation of a new industry (Teece, 2010, p. 183). In this way, the BM developed to become an object for innovation. This phenomenon is emphasized by the results of recent studies from KPMG International (2006) or the The Economist Intelligence Unit (2005), as well as the rising number of scientific studies and concepts from different scientific disciplines, as this chapter will present. Besides this, the drivers of business model change are presented (section 5.1) as well as the necessary capabilities for these change activities (section 5.4).

5.1 Drivers of Business Model Change

Nearly every industry has to deal with disruptive innovations. Thus, it is important to be aware of developments in the environment, of disruptions occurring, and to find a way to respond to these circumstances. However, these actions also involve difficulties for companies because it requires them to break away from the existing way of doing business. (Voelpel et al., 2005, p. 37) Voelpel et al. (2005, p. 37pp) compare this difficult situation to the *Red Queen effect* described by Lewis Carroll's "Through the Looking Glass". The Red Queen effect means that, in order to stay competitive, the company needs to run faster or it will fall behind. Unfortunately, this is a trap, and companies tend to stay within this trap because they only try to distinguish themselves from their competitors through better products, for example. When

competitors take the same action, the competitive advantage only lasts for a short period. Thus, staying competitive by running faster leads to success in the short-term, but mostly fails in the long-term. Instead, companies need to think about being different and changing the industry rules. To avoid the Red Queen effect, companies need to forget about previous behavior and broaden their mindset so that they can recognize changes and develop *proactive capabilities* to handle these situations. This tactic requires reinvention of the business model.

It is imperative to scan the environment on a continuous basis in order to effectively change the business model and handle the rising complexity, uncertainty or disruptions on the market. Osterwalder and Pigneur (2010, p. 200) describe these factors in shaping the BM as *design drivers* if they are new technologies or customer demands or as *design constraints* if they are in the form of regulations or a dominant competitor. Factors influencing the BM span industry forces, market forces, macro-economic forces and key trends (Osterwalder and Pigneur, 2010, p. 200pp). *Market forces* incorporate, for example, changing customer needs or market issues influencing the BM (Hamel and Välikangas, 2003, p. 53; Osterwalder and Pigneur, 2010, p. 202; Teece, 2010, p. 187p). In this context, Wirtz (2011a, p. 212) also emphasizes the greater influence of the customer due to his/her participation in value creation. *Industry forces* in the form of competitors, new entrants, substitute products or services as well as further stakeholders and participants are all factors that may influence the company's own business (Reinhold et al., 2011, p. 84p). Wirtz (2011a, p. 211p) also states that, due to globalization and new innovation and communication technologies, dynamic market environments and stronger competition are the issues driving the development of new business models. *Key trends* include technological developments and regulatory as well as socioeconomic, societal and cultural trends. Technological developments are highlighted as very important factors driving changes in the business model because new business models are usually necessary to exploit new technologies. (Hamel and Välikangas, 2003, p. 53; Osterwalder and Pigneur, 2010, p. 206; Teece, 2010, p. 187p; Reinhold et al., 2011, p. 84p; Wirtz, 2011a, p. 210pp) *Macro-economic forces* are developments in the global market, the capital market or the economic infrastructure (Afuah, 2003, p. 162p; Osterwalder and Pigneur, 2010, p. 208). Almeida et al. (2009, p. 29) also emphasize the *economic crisis* as a reason for companies to change their business model, describing it not only as a threat, but also an opportunity for companies. In addition, *internal factors* also drive business model changes. These factors include the corporate culture, the information available, the knowledge basis, capabilities and competencies of employees, and the combination of resources or product and service innovations. (Giesen et al., 2009, p. 7; Reinhold et al., 2011, p. 85)

In their case study on the factors driving business model dynamics of start-ups, Reuver et al. (2009, p. 6pp) examined three factors influencing the business model during its life cycle: Market, technology and regulation. They revealed that technology and market drivers play a major role during the initial phase of BM development, but regulatory drivers only have a minor role in all phases. Johnson et al. (2008, p. 57) identified five circumstances and opportunities,

respectively, when a change in the business model is required. The first opportunity may be the chance to address a large potential group with a new business model, for example democratizing products in emerging markets. Second, a new technology wrapped in a new business model or leveraging a technology to a new market also requires a change in the business model. The third and fourth opportunities are the introduction of a new job-to-be-done that did not previously exist and fending off low-end disrupters. The last opportunity described involves responding to a shift in competition. Johnson et al. (2008, p. 57) emphasize that, prior to changing the business model, the company has to ensure that the opportunity for the new business model is large enough and that the business model is new to the company and also in some way changes the game of the industry or market. If these issues cannot be fulfilled, a change in the business model should not be considered. Furthermore, they explain that the old business model should not be substituted; but rather should be complemented and reinforced.

The business ecosystem is also seen as an important source of new business models⁶⁴ because it provides information and inspiration, influencing the BM through its actors, competitive conditions, trends, as well as the dominant branch logic where differences reveal weak spots in the BM and, therefore, indicate that a change is necessary. Besides the business model, the business ecosystem and its participants also change on a regular basis, creating an unstable environment that is hard to predict and complex due to interactions between participants that are not visible (Berglund and Sandström, 2013, p. 278). (Gassmann et al., 2011, p. 200pp) Considering the business ecosystem as a source of new opportunities, companies need to open their boundaries and develop an *open business model* (see also section 4.2.3). Chesbrough (2007, p. 15) describes the most open form of business models as an *adaptive platform*, often provided through technologies, where important suppliers and customers are partners and risks are shared. Partners are integrated into the planning activities of the company and vice versa; their business models are integrated. Companies with an open business model search in the business ecosystem for partners who are most suitable for value creation. Working together with partners⁶⁵ can be helpful in complementing the company's original business model (Hummel et al., 2003, p. 53). Palo and Tähtinen (2011, p. 382pp) especially emphasize the customer as playing an important role; an exchange with the customer in order to identify changing needs is imperative. The roles of externals can take on several configurations depending on the motivation of the partner, the role, and the existing relationship. Partners playing a *structural and integrative role* have long-term relationships with the company because they are important for the ability of the business model to survive. If the partner has a *supporting or facilitating role*, relationships are rather short-term and often only necessary at a specific point in time. (Bouwman, 2003, p. 20pp) Nielsen and Nontemari (2012, p. 157) highlight the role of human resources in an open business model, where specific partners are key drivers for the business model's success. When it comes to changes in the BM, the relationships, and the

⁶⁴The interconnection between the company and the business ecosystem was already discussed in chapter 3 and section 4.2.3.

⁶⁵Hummel et al. (2003, p. 53) explain research partners in particular in this context.

information and knowledge flowing into it are essential. However, an open business model and the partners involved may also hinder the process; this increases with the number of partners involved. Berglund and Sandström (2013, p. 279pp), therefore, describe several criteria, such as increased knowledge sharing, the establishment of social norms in the form of trust and reciprocity, higher network stability from the willingness to collaborate, the trustworthiness of the firm in question and opportunities to align with others, as factors mitigating this risk.

To sum up, the BM is influenced by different factors in the business environment, forcing the company to rethink the current BM. This can be challenging if the company has an open business model and involves different partners in the business ecosystem in value creation because the BM of the company and the partners influence one another. Several internal and external drivers influencing the business model of companies operating in a high-technology industry are presented in section 7.2. Different roles embodied by external partners in the changeability of the business model are discussed in more detail in chapter 8.

5.2 Forms and Types of Changes to the Business Model

Discussions on changing the business model range from *which elements* of the BM should be changed (e.g. Mitchell and Coles (2003, p. 16p), Cavalcante et al. (2011, p. 1330)) to *the extent* to which the BM and its elements should be changed, resulting in different *types of business model change* (Mitchell and Coles, 2003, p. 18pp; Cavalcante et al., 2011, p. 1330). This section provides an overview of these types of change, followed by a closer look at business model change concepts discussed in the literature.

Changes can take place in different forms. A *radical change* exists if a new product and the value together with this product render an existing product obsolete and noncompetitive, respectively. This can often be observed by new market entrants because incumbent companies fear cannibalization of existing products. Improvements in existing products to remain competitive are usually of an *incremental* nature. Incumbents mainly use incremental changes to reinforce their existing position in the market. *Disruptive change*⁶⁶ is understood as the creation of a new market by introducing new products or services. At first, the cost of these new products or services is lower, but initial performance is not as good as that of existing products or services. If other participants along the value system have an impact on the company's business model, it is a *systemic change*. *Dynamic changes* are seen as changes in the technology life cycle and the evolving impact of these changes on the customer value and the business model. (Afuah, 2003, p. 164pp) These general forms of change are also applied in the context of business model change and result in a vast number of concepts.

⁶⁶The explanation of disruptive change was coined by Christensen (1997), explaining the failure of incumbent companies to implement radical changes because they only listen to existing customers, who are not the target group of disruptive technological changes.

Different forms and intensities for changing the BM are described by Cavalcante et al. (2011, p. 1330pp). They state that not all changes necessarily change the business model – only changes that have an effect on the “*core standard repeated processes*” of the business model. They distinguish between four types of business model change: business model creation (I), business model extension (II), business model revision (III) and business model termination (IV) (see figure 21). *Business model creation* means building and creating a new business model. This takes an entrepreneurial view, explaining the transition from the initial business idea to a new venture, including the establishment of all necessary processes for the business. In this early stage, several adjustments are made to the new BM in order to align the BM with the environment. The *business model extension* adds new activities and/or expands existing core processes (denoted as (+) in figure 21). The business model is extended in order to explore or exploit business opportunities, including the addition of more products and/or services. In figure 21, this is shown as the transition from block I to block II or between the first and the second block. In comparison, *business model revision* means that activities or processes are removed and replaced by new processes (shown as transition from block II to block III and denoted as (-)/(+)). This change to existing processes usually implies that a different direction is chosen, perhaps also by exploring new business options. The changes taken within business model revision are of a fundamental nature. *Business model termination* removes processes (shown as transition from block II to block IV and denoted as (-)). This can result in the termination of business areas or business units, but also in closure of the entire company.

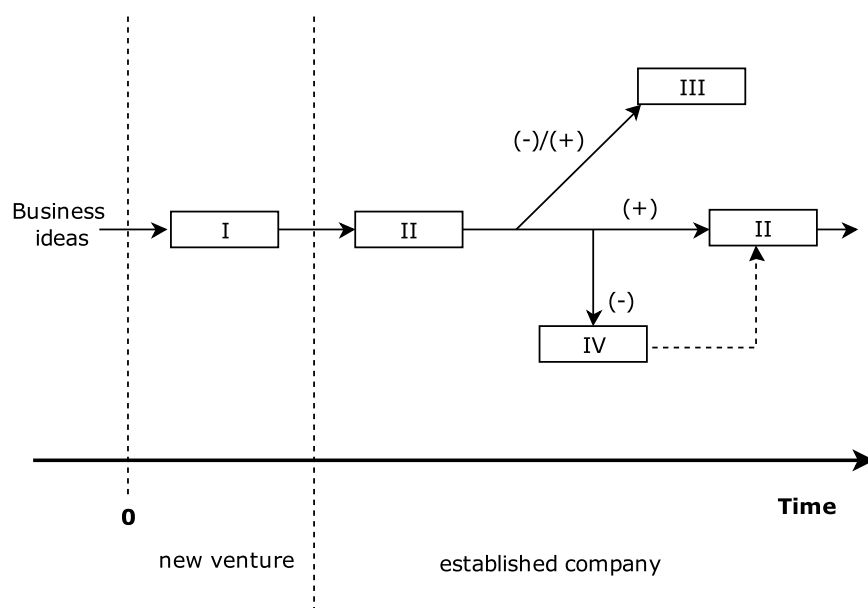


Figure 21: Types of business model change (referring to Cavalcante et al., 2011, p. 1331)

Linder and Cantrell (2000, p. 10pp) distinguish between four different change models – the realization model, the renewal model, the extension model and the journey model. As shown

in figure 22, the realization model and renewal models do not change the BM, whilst the extension and journey model do change it. The degree of business model change rises with the extension model and the journey model; the journey model always involves a change in the BM. In the *realization model*, companies try to secure as much return as possible from the existing operating model. This can be in the form of a geographical expansion of the customer base, for example. Continuously changing the product and service platforms, cost structures or technology bases are the main goals of the *renewal model*, requiring companies to leverage existing skills. Innovative companies use this model to remain at the front of the value curve. In the renewal model, the operating business model can change in the form of new capabilities or relationships established or customers added. The *extension model* to include new markets, adds new functions within the value chain or new product or service lines. Additional operations are added; reverse and forward integration, respectively, or leveraging existing capabilities are just some examples of activities within this model. The goal of the *journey model* is the creation of a new business model, including the establishment of a new operating model. This can take the form of globalization activities, for example, or up-market/down-market migration⁶⁷.

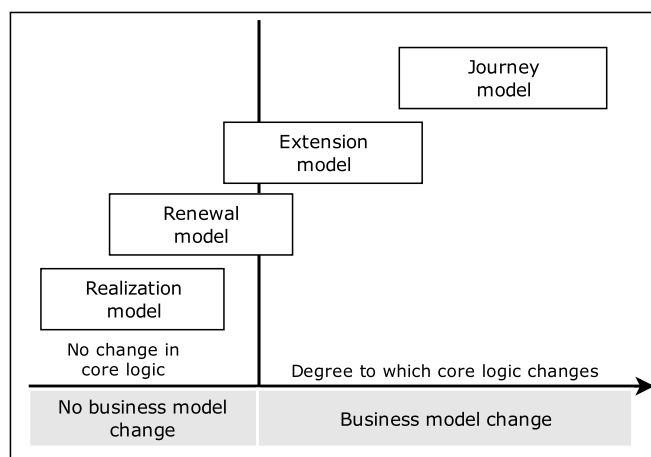


Figure 22: Change Models (referring to Linder and Cantrell, 2000, p. 13)

In their description of business model changes, Mitchell and Coles (2003, p. 16p) distinguish between four change models according to their *intensities of change*: Business model improvement, business model catch-up, business model replacement and business model innovation. In *business model improvement*, one BM element is changed, resulting in a performance increase in relation to competitors. If the company only matches the competitor's offerings, they achieve a *business model catch-up*. If at least four BM elements are improved, the company conducts *business model replacement*. If this replacement includes the provision of products and services not previously available, *business model innovation* (BMI) takes place. BMI is also

⁶⁷They explain it through shifting competition from prices towards brand or services and vice versa (Linder and Cantrell, 2000, p. 13).

the process of these replacements, and if it is an ongoing process, it is a *continuing business model innovation*. The characteristics of BMI are discussed in more detail in section 5.3.1.

Different paths for innovating the BM are introduced by Almeida et al. (2009, p. 31pp). The *adaptability* of the business model should be enhanced by modularity; the business model needs to be structured to enable easy “plug-and-play” replacement of components. The establishment of partnerships should foster the creation of an *open-source model*, where the company does not innovate all elements the alone, but together with partners who bring individual elements into the model. Spin-offs or joint ventures are also seen as an opportunity to reach new business domains. With the *consolidation of different business units*, traditional structures of the company are broken down and the value offered to the customer realigned. Another way of changing the business model is to *shift from merely offering products or services to offering an experience* to the customer. For example, the iPod creates the experience of being a part of the customer’s lifestyle, realized through marketing initiatives and great service after the purchase. Additional ways of changing the BM are geographical expansion, redefinition of the channel concept, changes in price mechanisms, as well as collaboration with customers and other partners. Within these possible means of changing the BM, Almeida et al. (2009, p. 34p) stress the important role of information technology because technological developments enable companies to create flexible infrastructures, providing a quick response to changing environmental conditions.

BM changes have a tremendous influence on the whole company because they change how a company works (Teece, 2010, p. 187; Gassmann et al., 2011, p. 199). These activities are often accompanied by resistance from within the company due to the involvement of all departments. This is one reason why changes in the BM commonly appear in young companies that are still in the process of developing the right BM. Thus, competencies to motivate the company and also question the BM are necessary in successful and ostensibly secure periods and are also the most important competencies for the future. (Gassmann et al., 2011, p. 199p) First of all, a proper evaluation is needed of issues inside and outside the company prior to business model changes (more details in section 5.4). In order to identify the effectiveness of change activities, an assessment can be conducted using four features (Casadesus-Masanell and Ricart, 2009, p. 26):

- How well do choices contribute towards achieving the goals of the company?
- How well do the choices reinforce each other?
- How well does the business model support the company in achieving the goals over time?
- How robust is the business model over time, meaning the sustainability of its effectiveness?

In addition, the BM also needs to be analyzed in interaction with its partners, where tactical interactions determine how business models of companies interact with each other, the consistency determines the strength of the business model in this interaction and the strategic interaction reveals how changes in the business model will affect other business models.

(Casadesus-Masanell and Ricart, 2009, p. 26)

This overview shows the different forms and intensities of how to change the business model described in the literature. Table 7 summarizes and provides an overview of these forms. The main concepts on how to change a business model are investigated in the next section.

Author	Type of BM change	Characteristics
Cavalcante et al. (2011, p. 1330pp)	Business model creation Business model extension Business model revision Business model termination	<ul style="list-style-type: none"> - building and creating a new BM or changing the existing one - establish, add or remove activities and processes - new venture, explore/exploit business opportunities, termination of business units or whole company
Linder and Cantrell (2000, p. 10pp)	Realization model Renewal model Extension model Journey model	<ul style="list-style-type: none"> - Extension and journey model change the BM - Realization and renewal model change existing operating model - Extension model includes new markets, enlarges new functions within the value chain or new product/service lines - Journey model creates new BM, including the establishment of a new operating model
Mitchell and Coles (2003, p. 16p)	Business model improvement Business model catch-up Business model replacement Business model innovation Continuous business model innovation	<ul style="list-style-type: none"> - Change in one BM element (BM improvement) - Change in at least four BM elements (BM replacement) - BM replacement, including providing of products and services not available before (BMI)
Almeida et al. (2009, p. 31pp)	Paths to an innovative BM	<ul style="list-style-type: none"> - Enhance adaptability - Establishment of partnerships or create spin-offs/joint ventures - Consolidation of business units - Offer solutions and experiences - Geographical expansion - Redefinition of channel concept - Change price mechanisms - Collaborate with customers and other partners

Table 7: Summary of types and forms of BM change

5.3 Concepts for Changing the Business Model

Besides the different types and forms of changes to the BM described in the previous section, there are various concepts in the literature explaining changes in the BM: These concepts include business model innovation (e.g. Osterwalder and Pigneur (2010)), business model evolution

(e.g. Demil and Lecocq (2010)), business model dynamics (e.g. Mason and Leek (2008)), business model reinvention (e.g. Voelpel et al. (2005)) and business model flexibility (e.g. Mason and Mouzas (2012)). Until now, there has been no clarity on the unique characteristics of these concepts, and they are commonly subsumed as business model innovation. They are also lacking in the description of their goals and focus, as well as scope of change. Furthermore, it is not very obvious how these concepts differ from each other. Very often, it is not clear how BMI delimits to the other concept, and as the research on these concepts is largely sparse, they are equated to BMI. In addition, two concepts that emerged in the context of strategic development, “value innovation” (e.g. Kim and Mauborgne (1997)) and “strategic innovation”, (e.g. Markides (1997)), do not explicitly describe, but do mainly deal with BMI. To shed some light on the similarities of and differences between these concepts and to show overlaps and distinctions compared to BMI, the different concepts are described and compared in the next paragraphs. This section is mainly based on the research paper published by the author (Mueller, 2014) of this thesis, but is complemented in some parts by a more detailed description.

5.3.1 Business Model Innovation

The business model was developed over the past few years from a *vehicle for innovation* in order to commercialize new technologies towards a *source of innovation*, emerging as a source of competitive advantage. Investing in BM changes creates opportunities to completely change the logic of industries. (Massa and Tucci, 2013, p. 7p)

Business model innovation (BMI) has not yet been clearly defined. Frequently, BMI is compared to the *introduction of a new product or service*, but in addition, it includes the redefinition of an existing product or service, its delivery to the customer and/or how the company profits from these offerings. The novelty focus is very important for BMI, especially the novelty in creating value. BMI incorporates different kind of innovations, like process innovation, product or service innovations or paradigm innovation⁶⁸, whereas Francis and Bessant (2005, p. 177) see BMI as part of the *“innovation in outer-directed paradigms”*. (Björkdahl and Holmén, 2013, p. 214p) Björkdahl and Holmén (2013, p. 215) describe BMI as changes in the integrated logic of creating and capturing value through new combinations of old and new products or services, a change in the market position, in processes, and so on. The question of *how new* the BM should be has not been clarified to date. The literature says that the outcome has to be at least a significant improvement on the existing BM or the company has to develop a completely new BM.

Mitchell and Coles (2003, p. 18pp) found that most business model innovations prior to the

⁶⁸Paradigm innovation changes how activities are seen by the company (Björkdahl and Holmén, 2013, p. 214p).

1990s emerged as a result of new entrants; existing companies only tend to expand their existing BM. However, established companies also recognized that continuous BMI is important for growth and securing a competitive advantage. Such continuous improvements are realized through quick and agile enhancements, which are inexpensive to implement and quick to repay. (Mitchell and Coles, 2003, p. 20p)

A first attempt to provide an overview of current research streams on BMI was conducted by Schneider and Spieth (2013b, p. 5pp), analyzing the available literature on BMI. They divided the literature into three research fields – enablers of BMI, process and elements of BMI, and effects of BMI. In addition, they distinguished between business model development and business model innovation. Business model development is the adjustment and continuous improvement, respectively, of the existing BM on the basis of the opportunities identified. The outcome should be financial success and growth, achieved through the combination of resources and capabilities available or the allocation of new ones. The resource-based view can be considered the explanatory theory, whereas dynamic capability theory serves as the basis to explain the dynamic perspective. In contrast, BMI is viewed as the exploration of opportunities in the surrounding environment that should be pursued alongside the existing BM. This should help to prepare the company for future changes and enable a flexible reaction. Strategic entrepreneurship is essential here.

The following paragraphs highlight the characteristics of innovation in general as well as its meaning for BMI. Subsequently, different concepts and definitions of BMI are presented and discussed.

5.3.1.1 Innovation and its Meaning in Business Models

Prior to explaining the meaning of innovation in business models, a general definition is given of innovation and its characteristics.

Basically, innovation must to be distinguished from *invention*. *Invention* is the discovery of new potentials for solving problems without any commercial exploitation. In comparison, *innovation* is the realization of these new potentials for solving problems in the form of new products or processes. (Zollenkop, 2006, p. 107p) From an economic point of view, innovations are intended improvements in the company's own economic success on the market or novelties implemented within the company. (Gerpott, 2005, p. 37) The novelty character of innovation is a subjective perspective because it must always be determined from the point of view of the company concerned. In general, an innovation is a combination of know-how and components, respectively, which in the majority of cases already exist. (Zollenkop, 2006, p. 107p; Tidd and Bessant, 2013, p. 39) Innovation can be considered as result-oriented or output-oriented. The *result-oriented* consideration focuses on intended improvements in the company, which

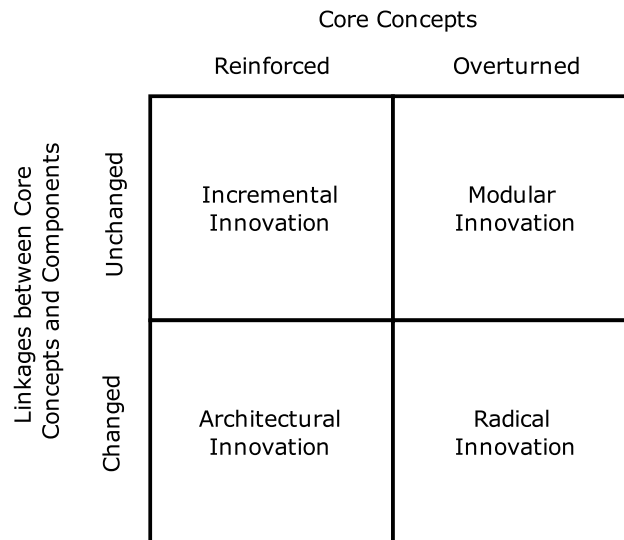


Figure 23: Categories of innovation (referring to Henderson and Clark, 1990, p. 12)

can be differentiated in several aspects. One such aspect is consideration of the *innovation object*. Innovation objects are, for example, product innovations, social innovations or process innovations, but also business model innovations developed towards a new innovation object that integrates other innovation objects (Schallmo, 2013, p. 24). Another aspect is the *degree of innovation*, ranging from small improvements, so called *incremental innovations*⁶⁹, to fundamental changes, so called *radical innovations*⁷⁰. In order to stay competitive, companies should pursue both incremental and radical innovations. (Gerpott, 2005, p. 38pp; Zollenkop, 2006, p. 107pp) The final aspect considers differentiation of the *newness* on the basis of a chosen perspective (company-oriented, customer-oriented or competitor-oriented). (Gerpott, 2005, p. 46p) The *output-oriented or process-oriented perspective* considers the innovation process as a logical interrelation of activities and decisions in order to bring a new product onto the market or implementing a new process in the company. (Gerpott, 2005, p. 48) This process-oriented view can also be transferred to BMI because BMI comprises several activities that have to be performed and decisions that have to be made. These activities and decisions are used to develop, implement and market the business model. (Schallmo, 2013, p. 25)

Taking a systemic view of innovation – in this example product innovation – a distinction can be made between innovations *on the level of modules* or elements and innovation *between the modules*, i.e. the architecture of the product or system. The systemic view of innovation

⁶⁹Incremental innovations comprise enhancements to existing problem-solving mechanisms, building new know-how on the basis of existing know-how (Zollenkop, 2006, p. 107pp).

⁷⁰Radical innovations are fundamental changes in existing solutions as a result of new customer requirements. Existing products and processes become obsolete when these innovations are implemented. Thus, a different set of competencies and know-how is required. Radical innovations are very often introduced by new competitors, changing the competition as a result. (Zollenkop, 2006, p. 107pp)

was introduced by Henderson and Clark (1990, p. 11pp), classifying innovation using two dimensions: the *impact of an innovation on components* and the *linkages between components*, i.e. the *architecture* (see figure 23). The extremes are radical and incremental innovations, where either minor improvements are conducted in components and linkages or both undergo fundamental change. In a *modular innovation*, the module undergoes innovation, but the architecture remains the same, whereas in an *architectural innovation*, the architecture changes, but the modules stay the same. Tidd and Bessant (2013, p. 40) explain these kinds of innovation in an example: “*Changing the component level in building a flying machine might involve switching to newer metallurgy or composite materials for the wing construction or the use of fly-by-wire controls instead of control lines or hydraulics. But the underlying knowledge about how to link aerofoil shapes, control systems, propulsion systems, and so on at the system level is unchanged – and being successful at both requires a different and higher-order set of competencies.*” They compare architectural innovations as innovations at the system level, where the whole system is configured in a new way.

In their explanations of innovation, Henderson and Clark (1990) do not consider the number of modules that should be innovated. This issue is addressed by Wettengl (1999, p. 33), explaining the number of changed modules as *scope of a system innovation*. Using the categories of Henderson and Clark (1990), he describes different ways of innovating a system. Zollenkop (2006, p. 119pp) took this classification and transferred it to business model innovations. The modules equate to the elements of the BM, and the architecture is seen as the fit or coaction between elements. The innovation can either be within elements and/or within the architecture, resulting in four different types of BMI – the modular BMI, the architectural BMI, the incremental BMI and the radical BMI (see figure 24). Zollenkop (2006, p. 120) emphasize that changing two or more components of a business model changes the architecture at least incrementally. If just one BM element changes, the architecture does not necessarily change. Figure 24 shows the different types of BMI along the three dimensions *business model elements*, *business model architecture and relationships of efficiency*, respectively, and *scope and number of affected elements*, respectively. Figure 25 summarizes the BMI options and their characteristics.

In addition to the BMI categorization by Zollenkop (2006), other researchers have tried to clarify specific characteristics of BMI. Four central requirements of business model innovation are defined by Wirtz (2011a, p. 202): 1) Innovations have to be substantially different to the original status, 2) Innovations require the use of an idea on the market, 3) Initiation of the innovation creates demand pull or technology push, 4) The innovation is a kind of process. Transferred to descriptions of BMI, these issues are rarely found. Trimi and Berbegal-Mirabent (2012, p. 455) also describe three different aspects of innovation in a BM: First of all, business models can themselves be a *form of innovation*, realized by introducing new methodologies or modifying internal operations; products and/or services are not changed. Second, the BM can be innovated through *technology push* and the accompanying first mover advantage.

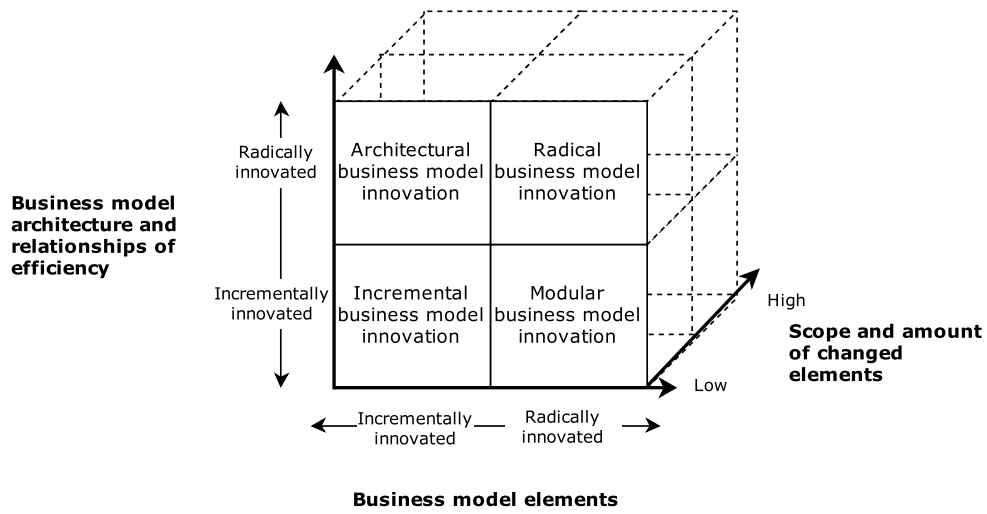


Figure 24: Options in business model innovation (referring to Zollenkop, 2006, p. 121; translated by the author)

<p style="text-align: center;">Architectural business model innovation</p> <ul style="list-style-type: none"> - Incremental innovation of business model elements - Radical innovation of the business model architecture - Elements are the same - Interfaces are new in principle 	<p style="text-align: center;">Radical business model innovation</p> <ul style="list-style-type: none"> - Radical innovation of business model elements - Radical innovation of the business model architecture - Elements are new in principle - Interfaces are new in principle
<p style="text-align: center;">Incremental business model innovation</p> <ul style="list-style-type: none"> - Incremental innovation of business model elements - Incremental innovation of the business model architecture - Elements are the same - Interfaces are the same 	<p style="text-align: center;">Modular business model innovation</p> <ul style="list-style-type: none"> - Radical innovation of business model elements - Radical innovation of the business model architecture - Exchange of elements - Interfaces are the same

Figure 25: Categories of business model innovation (referring to Zollenkop, 2006, p. 131; translated by the author)

Third, when using a *demand pull* approach, business models are changed in order to fulfill new customer needs and business requirements.

To summarize the meanings of innovation for business models, it can be noted that the BM is a new object of innovation. Innovations can take place in single BM elements and/or in the BM architecture, spanning the continuum from incremental improvements to radical new business models. In order to consider a change in the business model as innovation, Wirtz (2011a, p. 202) stated that the innovation has to be substantially different to the original status. In order to provide a better insight into existing concepts explaining BMI, different definitions and concepts are presented and discussed in the following paragraphs.

5.3.1.2 Definitions of Business Model Innovation

The definitions in table 8 show that the views on BMI are quite different. Basically, business model innovation is seen as a *process* (e.g. Skarzynski and Gibson, 2008, p. 111; Santos et al., 2009, p. 14; Schallmo and Brecht, 2010, p. 8; Berglund and Sandström, 2013, p. 276; Matzler et al., 2013, p. 31) for creating a new business model that is new to the company (Steenkamp and Arnoldi-van der Walt, 2004, p. 5; Björkdahl and Holmén, 2013, p. 214) and/or new to the industry (Santos et al., 2009, p. 14; Schallmo and Brecht, 2010, p. 8). Besides the process-oriented view, BMI is also treated as a *result* (like the result-oriented view of innovation), a replacement of the existing BM of the company (Mitchell and Coles, 2003, p. 16p) or a change in several elements of the existing BM (Lindgardt et al., 2009, p. 2). In addition, BMI can also be a part of a company's *capability base* (Aspara et al., 2010, p. 40). Business model innovation is reconfiguration of the value creation (Stähler, 2002, p. 52; Wirtz, 2011a, p. 206; Sako, 2012, p. 23p; Casadesus-Masanell and Zhu, 2013, p. 464; Matzler et al., 2013, p. 31) or value proposition (Wirtz, 2011a, p. 206; Casadesus-Masanell and Zhu, 2013, p. 2) to deliver new value to customers or other partners of the company. In order to obtain an idea of the distinct understandings of BMI, the various concepts and their characteristics are explained below.

Author	Definitions of business model innovation
Stähler (2002, p. 52)	<i>“Geschäftsmodellinnovationen sind immer Wachstumsstrategien. Einerseits kann eine Geschäftsmodellinnovation dazu dienen in einer bestehenden Industrie die Art und Weise der Wertschöpfung zu verändern, um ein bestehendes Bedürfnis von Kunden zu befriedigen, andererseits kann eine Geschäftsmodellinnovation bewusst in entstehenden, neuartigen Märkten eingesetzt werden, um überhaupt diese Märkte zu erschließen.”</i>
Mitchell and Coles (2003, p. 16p)	<i>“When a company makes business model replacements that provide product or service offerings to customers and end users that were not previously available, we refer to those replacements as business model innovations”. [...] “We also refer to the process of developing and making these novel replacements as the process of business model innovation.”</i>
Steenkamp and Arnoldi-van der Walt (2004, p. 5)	<i>“BMI promotes the innovation of the total business model of an organization in order to become customer-focused. It identifies human involvement in, and interaction with, customized products according to customers’ specific needs as the core activity of the new business model.”</i>
Skarzynski and Gibson (2008, p. 111)	<i>“At its essence, business model innovation is about creating fundamentally new kinds of businesses, or about bringing more strategic variety into the business you are already in – the kind of variety that is highly valued by customers.”</i>
Lindgardt et al. (2009, p. 2)	<i>“Innovation becomes BMI when two or more elements of a business model are reinvented to deliver value in a new way.”</i>
Santos et al. (2009, p. 14)	<i>“Business model innovation (BMI) is a reconfiguration of activities in the existing business model of a firm that is new to the product/service market in which the firm competes.”</i>
Aspara et al. (2010, p. 40)	Business model innovation can be seen “as a potential aspect of a firm’s (innovative) corporate culture or capacity/capability” but also as “a potential continuous strategic orientation of a firm”.
Osterwalder and Pigneur (2010, p. 5 and p. 136)	<i>“Business model innovation is about creating value, for companies, customers, and society. It is about replacing outdated models.” [...] “Business model innovation is not about looking back, because the past indicates little about what is possible in terms of future business models. Business model innovation is not about looking to competitors, since business model innovation is not about copying or benchmarking, but about creating new mechanisms to create value and derive revenues. Rather, business model innovation is about challenging orthodoxies to design original models that meet unsatisfied, new, or hidden customer needs.”</i>
Johnson (2010, p. 13)	<i>“Seizing the white space requires new skills, new strengths, new ways to make money. It calls for the ability to innovate something more core than the core, to innovate the very theory of the business itself. I call that process business model innovation.”</i>

Author	Definitions of business model innovation
Schallmo and Brecht (2010, p. 8)	<i>"Business model innovation is the development of a new business model that changes an industry. Business model innovation is future and customer-oriented, considers the macro and micro environment and is valid for all business model levels. Business model innovation can be made for one or more element(s) of a business model. The target is to have knowledge on future customer needs and satisfy them in a new way of creating value. Similar to other innovations such as product, service, process, business model innovation should be executed in a structured way."</i>
Najmaei (2011, p. 165)	<i>"[...] business model innovation is a strategic process based on the firm's higher order capabilities [...]"</i>
Wirtz (2011a, p. 206)	<i>"Business Model-Innovation bezeichnet den Gestaltungsprozess zur Hervorbringung eines weitgehend neuen Geschäftsmodells in den Markt, welches mit einer Anpassung der Value Proposition und/oder der Value Constellation einhergeht und auf die Generierung oder Sicherung eines nachhaltigen Wettbewerbsvorteils abzielt."</i>
Björkdahl and Holmén (2013, p. 214)	<i>"[...] a business model innovation is a new integrated logic of how the firm creates value for its customers (and users) and how it captures value."</i>
Casadesus-Masanell and Zhu (2013, p. 464)	<i>"[...] business model innovation refers to the search for new logics of the firm, new ways to create and capture value for its stakeholders, and focuses primarily on finding new ways to generate revenues and define value propositions for customers, suppliers, and partners."</i>
Gassmann et al. (2013, p. 9)	<i>"Als Faustregel zur Abgrenzung von Produkt- und Prozessinnovation gilt, dass sich eine Geschäftsmodellinnovation auf mindestens zwei der vier Geschäftsmodellkomponenten (Wer-Was-Wie-Wert?) signifikant auswirkt."</i>
Matzler et al. (2013, p. 31)	<i>"Business model innovation results when a company increases customer value and simultaneously creates a new value creation and revenue model that allows the company to capture some of the value created in a new way."</i>

Table 8: Selected business model innovation definitions

In the literature, there are various concepts defining *typologies* of BMI. One of these typologies is defined by Massa and Tucci (2013, p. 8p), who distinguish between *business model design* (BMD) and *business model reconfiguration* (BMR). BMD describes the entrepreneurial view of creating, implementing and validating a business model for a new company. In comparison, BMR describes the change to an existing BM as a result of reconfiguration or acquisition of organizational resources. Massa and Tucci (2013, p. 9) see BMI as a subset of these two concepts (see figure 26), because the outcome of both BMR and BMD incorporates some degree of novelty, but not all changes to the BM lead to BMI. BMR is described in more detail in section 5.3.2.5.

Another classification of BMI is defined by Koen et al. (2011, p. 53p). They emphasized the difference between business model innovation and sustaining innovation in established

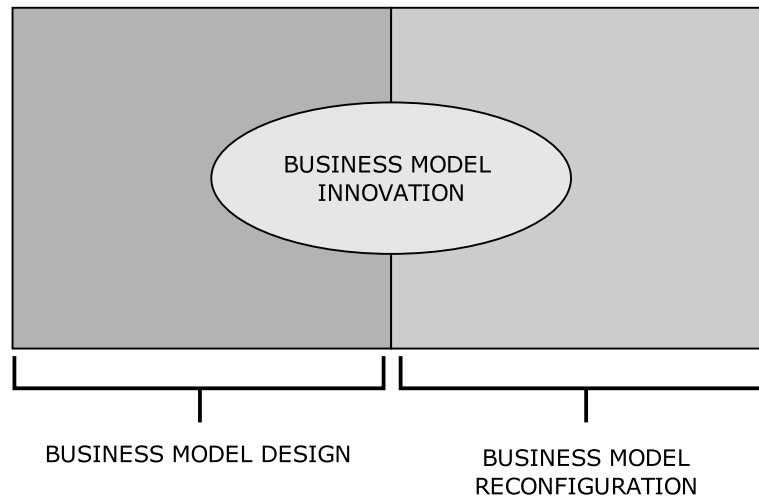


Figure 26: BMI as a subset of BMD and BMR (referring to Massa and Tucci, 2013, p. 9)

companies. The business model typology consists of three dimensions for classifying innovation (see figure 27): technology, value network and the financial hurdle rate. The resulting innovation space is further divided into two areas: sustaining innovation and business model innovation, where established companies commonly fail. The *technology dimension* distinguishes between incremental, architectural and radical innovation. The *value network dimension* includes relationships with suppliers, distributors and customers and distinguishes between the existing network, a new value network with existing consumers that are not yet customers and a new value network with new non-consumers. The third dimension – *financial hurdle rate* – illustrates how the financial projections and the minimum expected return relate, based on low-cost business models of disruptive innovations. This is difficult for incumbents because the cost structure usually does not meet the required rate of return. During these activities, companies have to face different challenges, which are usually more substantial during business model innovation than sustaining innovation. They further highlighted the challenge of having two different business models integrated into one division. (Koen et al., 2011, p. 53pp)

Three main types of business model innovation were introduced by Giesen et al. (2007, p. 27p) and by Giesen et al. (2010, p. 20) as a result of analyzing 35 cases: Industry model innovation, revenue model innovation and enterprise model innovation. With *industry model innovation*, the company innovates the industry value chain by moving into new industries, redefining existing industries or creating entirely new ones, also by identifying or leveraging unique assets. If a company is innovating its *revenue model*, it reconfigures its offerings and/or introduces a new pricing model to generate revenues. *Enterprise model innovations* change the role of the company in the value chain through changes in the business ecosystem together with the configuration of resources. This can be realized through value chain integration, via specialization in core competencies or via external collaboration. Giesen et al. (2007, p. 30)

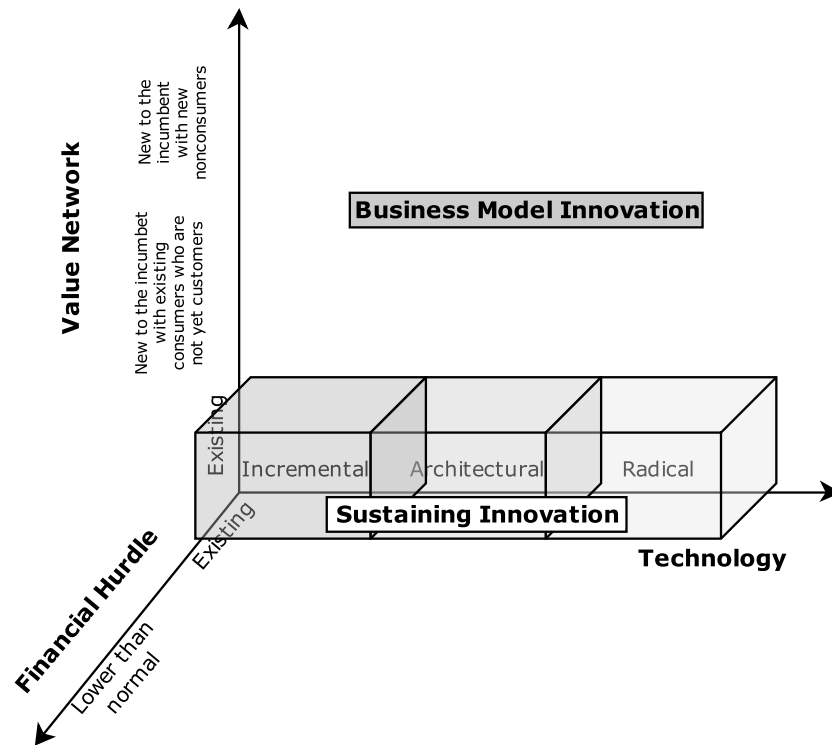


Figure 27: Business model innovation typology (referring to Koen et al., 2011, p. 54)

emphasized that all three models, alone or combined, can lead to success.

Santos et al. (2009, p. 19) describe four possible ways of innovating the business model – relinking, repartitioning, relocating or reactivating. By *relinking*, the linkages between activities are changed. This can be in the form of transaction governance between units or the way that activities are performed. *Repartitioning* changes the firm's boundaries through in-sourcing or outsourcing of activities. The physical, cultural and institutional location is altered during *relocating* in the form of offshoring or onshoring. *Reactivating* changes the set of activities of the company by adding or removing activities. Santos et al. (2009, p. 22) describe BMI as *competency-destroying* because it requires new skills and knowledge that differ from those available in the company.

Presse et al. (2012, p. 4p) distinguish between business model adaptation and business model innovation, but companies need the structural flexibility to do both. *Business model adaptation* means continuously analyzing and changing the existing BM, whilst *business model innovation* means the development of a completely new BM. They explain that it is important to identify the right point in time for the change. Thus, Presse et al. (2012, p. 5) introduce a business model life cycle consisting of three stages to find the right point in time: Value increase⁷¹,

⁷¹High market value, when there is still room available in the market (Presse et al., 2012, p. 5).

value stability⁷² and value loss⁷³. Adaptation of the BM has to start in the value increase phase by analyzing the BM, then designing the BM in the value stability phase and implementing it in the value loss phase.

Four paths and sources for innovation of the BM are described by Wang and Nie (2011, p. 247p). The first innovation source is the ability to integrate and use resources differently to competitors. In addition, innovation can also be realized by changing the value activity system of the company through reorganization of the value chain, outsourcing of processes that are not core to the business or improving the business processes. Also, innovation of the customer value can be a potential source of growth. This can be realized by identifying potential demands, extending the value chain or improving the way in which products and services are delivered to customers. The final proposed source of innovation is the business revenue model, achieved by strengthening the revenue management or expanding the revenue channel. Three ways of changing the business model are also proposed by Amit and Zott (2012, p. 44) in the form of adding new activities (new content), linking activities in a novel way (new structure) or changing who is responsible for activity performance (new governance). They stated that if one or more elements are changed, the business model has changed. These elements are highly interdependent and used to design a business model.

Skarzynski and Gibson (2008, p. 114) underlined two different objectives of BMI: Either to invent a completely new BM, which is also completely new to the industry, or to evolve the existing BM. Companies usually concentrate on one of these objectives and forget about the other, but it is important to do both – continuously evolving the core BM and at the same time searching for new opportunities. Berglund and Sandström (2013, p. 276) see BMI as the introduction of a new BM, for example by changing the existing BM, with the aim of creating commercial value. They highlight the procedural characteristics of BMI in an open systems perspective. In doing so, several propositions were defined on the success of BMI with partners and actors outside the company.

There is also an important discussion between researchers on the *novelty and degree of change* in single business model elements. Skarzynski and Gibson (2008, p. 115pp) propose thinking holistically and considering every element of the BM as a potential source with which to create value and identify blind spots before competitors do. For this purpose, every element should be investigated to establish whether they reinforce each other positively. In comparison, Wirtz (2011a, p. 207pp) sees the value constellation, the value proposition or a combination of both as the subject of innovation. According to Johnson et al. (2008, p. 57), BMI should be considered if there is a significant change in *all elements* of the BM. Johnson (2010, p. 7) further explains that if the company only creates a new customer value proposition, a new BM is not necessarily required. The new model is required if the profit formula changes, a lot of

⁷²The business model creates profit in the market (Presse et al., 2012, p. 5).

⁷³Further business models entering the market lead to a decrease in the value (Presse et al., 2012, p. 5).

new key resources and processes are added and completely different core metrics, rules and norms for running the business are defined. If one or more of these apply, the company needs a new BM. To be successful, the company requires new skills, strengths and new ways of making money. Johnson et al. (2008, p. 57) also stated that a company does not need to make an effort to change the BM unless it is new to the company and also in some way new to the industry. Additionally, the opportunity provided by the new BM needs to be known in advance. Guo et al. (2013, p. 450) describe three elements of the BM which are innovated: The value proposition, value creation system and value capturing mechanism. They pointed out that BMI is especially important for companies operating in uncertain environments. Brink and Holmén (2009, p. 111) simply compared the radicalness of BM change to the amount of BM change by explaining that the more radical the change, *“the greater the degree and the larger the amount of simultaneous change of the business model is likely to be”*. Markides (2006, p. 19pp) equated BMI with strategic innovation and explains it as being the development of a completely new BM in an existing market. In order to call a BMI an innovation, it has to enlarge the economics by attracting new customers in the market or encouraging existing ones to consume more. He clearly stated that a BMI is not the introduction of a new product or service, instead it redefines the perception of existing products and services and how they are presented to the customer.

Almeida et al. (2009, p. 29pp) see the economic crisis as an initiating event for companies to innovate their business models, as already described. In their view, BMI incorporates the reconfiguration of various BM elements with the aim of securing sustainable value creation potential. In order to be successful, the BMI process integrates recognition of the need to change the BM, exploitation of new value creation opportunities and careful design of BM components to secure long-term value before competitors. Also Uçaktürk et al. (2011, p. 91pp) stated that BMI is a good strategy for gaining a competitive advantage during economic recession. Besides the economic crisis, additional indications for the need to change the BM are entrance to a new market and the emergence of a disruptive technology. A combination of processes and resources that distinguish the company from competitors, accompanied by the modification of products and services, is seen as BMI. In their study, Ho et al. (2011, p. 656pp) presented the effect of different types of BMI on the corporate value by considering the environment as an important factor influencing the BM and its changes. BMI can be realized by restructuring the BM components leading to a competitive advantage. This innovation is radical if the number of components affected and the degree of innovation are high; otherwise it is an incremental innovation. Furthermore, BMI also differs in terms of the target market according to whether the innovated BM meets the needs of the new market or the existing one.

Wirtz (2011a, p. 207pp) describes different aspects that should be considered when innovating the BM. One aspect is the *subject* of the innovation, which in his case can be the value constellation, the value proposition, or a combination of both. Another aspect is the *impact* of BMI on the market, meaning that a new BM can have a disruptive influence on the existing

market or develop a new market.

A *dynamic perspective* on business model innovation is introduced by Najmaei (2011, p. 167). Dynamic BMI is a process based on the dynamic capabilities view (see also section 5.4.1) for co-alignment and co-evolution of dynamic capability development and environmental scanning. In the dynamic BMI, exogenous shocks are met through contingency plans and endogenous shocks through a reconfiguration of the business model structure. These two shocks should be balanced by means of the dynamic process of capability development and the utilization of competencies. Najmaei (2011, p. 167) further sees the BM as a value creation system, where radical changes in the network structure are possible by reconfiguration. For this purpose, dynamic managerial capabilities are required to link and orchestrate partners socially and strategically in the network. This is described as a re-arrangement of inter- and intra-organizational relationships. Zhang et al. (2010, p. 400p) also see BMI as a continuous process according to changing customer needs. In their view, the main focus and starting point of BMI is the value proposition. They further see BMI as a combination of different kinds of innovations, such as innovating the products' design, manufacturing, but also marketing and the delivery channel. Wang et al. (2009, p. 455p) also see BMI as a dynamic and evolving process with the aim of learning about and incorporating technology innovation impacts into business model elements. They emphasized that the goal is to open the BM rather than creating a new one.

Table 9 summarizes the main characteristics of these concepts and further classifies whether BMI is seen as an incremental or radical change activity, performed continuously or discontinuously.

Author	Focus of change activities	IC	RC	CC	DC	Objectives of change activities
Mitchell and Coles (2003)	<ul style="list-style-type: none"> - improvement of at least four BM elements - provision of new products and services 	✓	✓	.	✓	<ul style="list-style-type: none"> - growth opportunity - competitive advantage
Markides (2006)	<ul style="list-style-type: none"> - new value proposition - new value chain activities 	.	✓	.	✓	<ul style="list-style-type: none"> - competitive advantage
Giesen et al. (2007) and Giesen et al. (2010)	<ul style="list-style-type: none"> - industry model innovation - revenue model innovation - enterprise model innovation 	✓	✓	.	✓	<ul style="list-style-type: none"> - success generation

5.3 Concepts for Changing the Business Model

Author	Focus of change activities	IC	RC	CC	DC	Objectives of change activities
Johnson et al. (2008)	<ul style="list-style-type: none"> - significant change of all BM elements - new to the company and in some way new or game-changing to the industry or market 	.	✓	.	✓	- success generation
Skarzynski and Gibson (2008)	<ul style="list-style-type: none"> - change as much as possible - consider every single element 	✓	✓	.	✓	<ul style="list-style-type: none"> - new value creation - find (breakthrough) growth opportunities
Almeida et al. (2009)	<ul style="list-style-type: none"> - reconfiguration of various BM elements 	.	✓	.	✓	<ul style="list-style-type: none"> - deal with new business opportunities - increase flexibility to market changes
Wang et al. (2009)	<ul style="list-style-type: none"> - expand the existing model 	✓	.	.	✓	- open the business model
Amit and Zott (2012)	<ul style="list-style-type: none"> - new activity system, content, structure or governance 	✓	✓	✓	✓	<ul style="list-style-type: none"> - create a new market - exploit opportunities in the existing market
Santos et al. (2009)	<ul style="list-style-type: none"> - relinking, repartitioning, re-locating or reactivating as possibilities for BMI - new to the product/service market 	✓	✓	✓	.	- performance advantage
Johnson (2010)	<ul style="list-style-type: none"> - every single BM element (profit formula, key resources and process, customer value proposition) - at least customer value proposition and another element 	.	✓	.	✓	<ul style="list-style-type: none"> - white space within - white space beyond - white space between
Schallmo and Brecht (2010)	<ul style="list-style-type: none"> - future- and customer-oriented - BMI for one or more elements 	.	✓	.	✓	<ul style="list-style-type: none"> - gain knowledge on future customer needs - satisfy customer needs through a new means of value creation
Sosna et al. (2010)	<ul style="list-style-type: none"> - trial and error learning process 	✓	✓	.	✓	- success in long term

5.3 Concepts for Changing the Business Model

Author	Focus of change activities	IC	RC	CC	DC	Objectives of change activities
Zhang et al. (2010)	<ul style="list-style-type: none"> - value proposition is the core of innovation - value creation, value delivery and value maintaining 	✓	.	.	✓	- competitive advantage
Najmaei (2011)	<ul style="list-style-type: none"> - co-alignment and co-evolution of dynamic capability development and environmental scanning 	✓	.	✓	.	- timely and properly BMI
Gassmann et al. (2011)	<ul style="list-style-type: none"> - every area in the company can be part of BMI 	.	✓	.	✓	- market opportunity
Koen et al. (2011)	<ul style="list-style-type: none"> - mainly developments within financial hurdle rate and value network 	.	✓	.	✓	- success generation
Ucaktürk et al. (2011)	<ul style="list-style-type: none"> - different combination of processes and resources to competitors 	.	✓	.	✓	<ul style="list-style-type: none"> - value creation for the company and customers - competitive advantage during economic crisis
Wirtz (2011a)	<ul style="list-style-type: none"> - new BM on the market - change of value proposition, value constellation or both 	.	✓	.	✓	- sustainable competitive advantage
Ho et al. (2011)	<ul style="list-style-type: none"> - rearrangement of business model elements - meet the needs of the new or existing market 	✓	✓	✓	✓	- competitive advantage
Wang and Nie (2011)	<ul style="list-style-type: none"> - integrate and use resources differently - business revenue model - customer value service - enterprise value activity system 	✓	✓	.	✓	- survive, achieve growth and develop the business
Presse et al. (2012)	<ul style="list-style-type: none"> - development of a completely new BM 	.	✓	.	✓	- stay competitive

Author	Focus of change activities	IC	RC	CC	DC	Objectives of change activities
Schneider and Spieth (2013b)	- development of a new BM	.	✓	.	✓	- exploration of opportunities in the environment
Berglund and Sandström (2013)	- development of a new BM - change an existing BM	✓	✓	✓	✓	- commercial value
Björkdahl and Holmén (2013)	- redefine existing product/service - customer delivery - how the company profits - novelty in value creation	✓	✓	.	✓	- value creation and value capture
Guo et al. (2013)	- new value proposition - new value creation system - build original value-capturing mechanisms	✓	✓	✓	✓	- firm's performance

Table 9: Main characteristics of business model innovation concepts

IC: incremental changes, RC: radical changes, CC: continuous change process, DC: discontinuous change process

Scholars' understandings of business model innovation are similar on the one hand, but on the other hand also diverse. One large discussion topic encompasses the *degree or intensity of change*. A group of academics see BMI as the radical outcome of a discontinuous change process that is new to the company (e.g. Johnson et al. (2008, p. 57)) and also in some form new to the industry (e.g. Johnson et al., 2008, p. 57; Schallmo and Brecht, 2010, p. 8; Wirtz, 2011a, p. 207pp). However, radicalism is not always present when talking about BMI. Incremental changes (e.g. Skarzynski and Gibson, 2008, p. 118; Santos et al., 2009, p. 19; Berglund and Sandström, 2013, p. 276) as a result of continuous improvements (e.g. Zhang et al. (2010, p. 400p)) are also discussed as an innovation of the BM. The focus of change activities are single BM elements, explained by most of the studies. In the majority of cases, changes occur in the value proposition (e.g. new offerings), value capture (e.g. new pricing models) or value creation (e.g. changes in the value chain, processes and resources). It can be concluded that every element of the BM represents a source of innovation. Another dominant discussion covers the *scope of elements* changed, in terms of how many elements should be changed. Skarzynski and Gibson (2008, p. 115pp) as well as Johnson (2010, p. 7) stated that as many as possible should be changed; every element should be innovated. Mitchell and Coles (2003, p. 17) proposed the change of at least four BM elements, whereas

Schallmo and Brecht (2010, p. 8) see the innovation of one or more elements as a necessity for innovation. The different opinions illustrate the rich diversity involved in the scope of change in BMI. Nonetheless, there is general agreement on the objectives of BMI: With the aid of an innovative business model, growth and business opportunities should be identified and encouraged in order to secure a competitive advantage. (Mueller, 2014, p. 7) Information on the other business model change concepts and their intensity and the scope of change are explained in the following sections.

5.3.2 Delineation of other Concepts Changing the Business Model

Besides the concept of business model innovation, other concepts for and descriptions of how to change the business model are described in the literature. The next sections explain these concepts in more detail.

5.3.2.1 Strategic Innovation

Markides (1997, p. 11) defines strategic innovation as *“breaking the rules of the game”*. Also Govindarajan and Gupta (2001, p. 4), Styles and Goddard (2004, p. 65) as well as Zollenkop (2006, p. 136p) see strategic innovation as a completely different way to play the game and as a new understanding of the business and competition. Strategic innovation does not necessarily need a technological innovation (Markides, 1997, p. 11; Zollenkop, 2006, p. 136pp), it is rather a change of the business strategy (Zollenkop, 2006, p. 136p) and/or the business model (Markides, 1997, p. 11; Govindarajan and Gupta, 2001, p. 4).

In a strategic innovation, the company identifies gaps in the industry (e.g. new emerging customer segments, new emerging or unmet customer needs) (Markides, 1997, p. 11; Zollenkop, 2006, p. 138) and decides to fill these gaps in order to create a new mass market (Markides, 1997, p. 11). Zollenkop (2006, p. 136) sees strategic innovation as a change in the competitive strategy, requiring a new combination of functions, actions and perspectives in the company that were not possible before. Strategic innovations normally create a new market niche, attracting more and more customers with the objective of achieving a better competitive position. Gebauer et al. (2012, p. 58) explain strategic innovation through three cornerstones: Reconfiguration of the business model, regeneration of existing markets and the fundamental improvement of customer value, where opportunities should be identified, markets reshaped and competition changed at the same time.

Markides (1997, p. 12) states that, within a strategic innovation, companies have to redefine their business – redefine who is served (new customers or customer segments), what is offered to customers (new products and services) and how existing core competencies should be

leveraged. Govindarajan and Gupta (2001, p. 4) as well as Govindarajan and Trimble (2005, p. 48) describe the realization of strategic innovation by changing at least one of these aspects: A complete redesign of the end-to-end value chain architecture, a complete reinvention of the customer value or/and a complete redefinition of the customer base. Strategic experiments should support implementation, where the company leaves the existing business and escapes into foreign waters by developing new knowledge and capabilities, but also accepts a period of unprofitability. Govindarajan and Trimble (2005, p. 48pp) suggest, therefore, separating the new business from the existing one, creating new structures, systems, and culture, and hiring new employees. Abraham and Knight (2001, p. 22) describe knowledge creation and innovative actions as a new way of thinking and as the core of strategic innovation, with the goal of creating and expanding markets. Thus, the company has to depart from the path of simply reacting to customer demands and instead concentrate on investing resources in emerging businesses with high profitability potentials. The subsequent actions depend on the environmental shifts of gradual, continuous or discontinuous change. In order to differentiate, companies have to think in a different way, as described by Styles and Goddard (2004, p. 65pp), and need to develop a new BM or strategy. The innovative aspect can be a new product or service, but also another part of the business model (e.g. distribution, pricing) or simply a combination of these innovations. Customer dissatisfaction should be the inspiration for this radical, discontinuous change, leading to more value and shaping the future environment.

Charitou and Markides (2003, p. 56) introduce *disruptive strategic innovation* as a special type of strategic innovation. Disruptive strategic innovation has the following characteristics: It faces different products or service attributes than traditional business, it normally starts as a small and low-margin business and grows in order to capture a large part of the established market. Concerning these characteristics, established companies cannot simply ignore disrupters, but have to consider how to respond. Disruptive strategic innovation is different to traditional business and remains in conflict with that business. Also, conflicts exist in integrating the new business into existing structures. Companies adopting this strategy have to think carefully about it beforehand. Different factors, like the nature of the industry, the competitive position of the firm and so on, have to be considered in the decision. The company's strengths and weaknesses as well as customer needs are additional factors determining how the rules of the game can be broken. However, strategic innovation is not a guarantor of success; it also depends on the management of the company in adopting this strategy. In order to be innovative, the appropriate culture, structure, systems, processes and incentives have to be established to support the incorporation of innovation within daily business. (Markides, 1997, p. 11pp)

Table 10 summarizes the main characteristics of these concepts and shows whether strategic innovation is seen as an incremental or radical change activity, performed continuously or discontinuously.

Author	Focus of change activities	IC	RC	CC	DC	Objectives of change activities
Markides (1997), Charitou and Markides (2003)	<ul style="list-style-type: none"> - fill existing gaps in the industry - redefine the business: who, what, how 	.	✓	.	✓	<ul style="list-style-type: none"> - new means of competing
Govindarajan and Gupta (2001), Govindarajan and Trimble (2005)	<ul style="list-style-type: none"> - change the BM through value chain architecture, customer value and customer base 	.	✓	.	✓	<ul style="list-style-type: none"> - change the rules of the game - create, cultivate and profit from completely new business models
Abraham and Knight (2001)	<ul style="list-style-type: none"> - knowledge creation and innovative actions - reinvent the business model - renew relationships 	✓	✓	✓	✓	<ul style="list-style-type: none"> - achieve superior growth - create and expand markets
Styles and Goddard (2004)	<ul style="list-style-type: none"> - development of a new business model or strategy - innovative aspect can be any part of the BM, the product or service offering, or a combination thereof 	.	✓	.	✓	<ul style="list-style-type: none"> - invent a new game - be different from industry rivals
Zollenkop (2006)	<ul style="list-style-type: none"> - identify a gap in the industry - change the competitive position - new combination of functions and actions 	.	✓	.	✓	<ul style="list-style-type: none"> - better competitive position
Gebauer et al. (2012)	<ul style="list-style-type: none"> - reconfiguration of the BM - regeneration of existing markets - fundamental improvement of customer value 	.	✓	.	✓	<ul style="list-style-type: none"> - change of existing competition

Table 10: Main characteristics of strategic innovation concepts

IC: incremental changes, RC: radical changes, CC: continuous change process, DC: discontinuous change process

In summary, the outcome of a strategic innovation is a completely different way to play the game, as are a new understanding of business and competition (Govindarajan and Gupta, 2001, p. 4; Styles and Goddard, 2004, p. 65; Zollenkop, 2006, p. 136p). This view is represented by all concepts describing strategic innovation. Strategic innovation does not need a technological

innovation (Markides, 1997, p. 11; Zollenkop, 2006, p. 136pp); it is a change of business strategy (Zollenkop, 2006, p. 136p) concerning the business model (Markides, 1997, p. 11; Govindarajan and Gupta, 2001, p. 4). In order to carry out a strategic innovation, the company searches for vacant positions in the branch and tries to fill the gaps identified (Markides, 1997, p. 11; Charitou and Markides, 2003, p. 56). Changes mainly concern the company's business model (Styles and Goddard, 2004, p. 65; Gebauer et al., 2012, p. 58), although the business model is seen as part of a strategic innovation (Abraham and Knight, 2001, p. 22; Zollenkop, 2006, p. 136pp). The focus of strategic innovation is a change in the customer base and the customer value (Govindarajan and Gupta, 2001, p. 4; Charitou and Markides, 2003, p. 56; Govindarajan and Trimble, 2005, p. 48). Other changes relate to the value chain, including functions, actions and competencies. Gebauer et al. (2012, p. 58) have a wider understanding of strategic innovation than Markides (1997, p. 11), Govindarajan and Gupta (2001, p. 4) or Govindarajan and Trimble (2005, p. 48) because they also see regeneration of the market as part of a strategic innovation. (Mueller, 2014, p. 7p)

5.3.2.2 Value Innovation

Value innovation was mainly coined by Kim and Mauborgne (1997; 1999). With value innovation, they explained how companies should pursue this in order to remain sustainable. They proposed not concentrating on competitors, but rather on customers because focusing on competitors leads to imitative and reactive actions. Value innovation renders competition irrelevant, exceeds incremental improvements and pushes the company into completely new ways of doing business. With value innovation, the buyer's value is the core of innovation. Thus, value innovation is different to technological innovation; a technological innovation is not needed for value innovation. The buyer's value is linked to value innovation and has to be considered if the offering is of superior value for the customer and if the price is affordable to the mass of targeted buyers. (Kim and Mauborgne, 1999, p. 42pp) Kim and Mauborgne (1997, p. 109pp) stated that value innovation can take place on three platforms: products, services (e.g. maintenance, customer service) and delivery (e.g. logistics, delivery channels). Usually, companies focus on the product and forget about the others, but the most successful companies are those who consider all three platforms.

In order to realize a value innovation, the top management has to communicate the commitment of the company and explain the underlying logic to the employees in order to orient them towards value innovation thinking (Kim and Mauborgne, 1999, p. 42pp). As an advancement of value innovation, Kim and Mauborgne (2005, p. 44) introduced the *blue ocean strategy*, where blue oceans represent untapped markets. An important tool for the value innovation and the blue ocean strategy is the *strategic value curve* (see figure 28). The value curve compares the actual value to success factors on which the branch currently relies and in which it invests, forming the conventional shape of the branch. The curve is used as a basis to identify factors

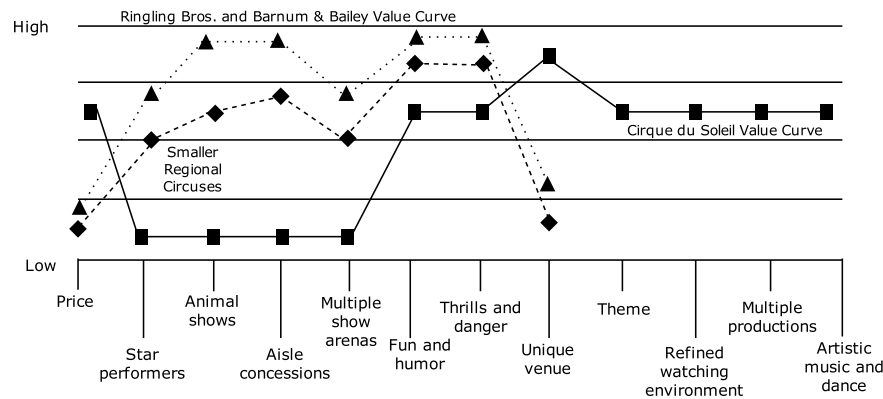


Figure 28: Value curve of Cirque du Soleil (referring to Kim and Mauborgne, 2005, p. 36)

that have to be reduced, eliminated, increased or newly created in order to create a new curve with a higher customer value. (Kim and Mauborgne, 1997, p. 108; Kim and Mauborgne, 1999, p. 108; Kim and Mauborgne, 2005, p. 22pp)

In addition to the definition by Kim and Mauborgne (1997; 1999), Matthysens et al. (2006, p. 751pp) describe value innovation as *“a reconceptualization of matured industry models. It involves a redefinition of a business whereby roles taken up by different firms and relationships among firms are redesigned”*. Value innovation is defined as a way to secure the competitive advantage through the creation of new markets or through new ways of competing while changing the dominant industry logic. They equate value innovation with strategic innovation, also seeing reconfiguration of the business model in order to create a new customer value as the main focus. A precondition for value innovation is the ability as well as the willingness to destroy outdated routines and processes to foster a new and better approach in the organization. Matthysens et al. (2006, p. 756pp) identified different ways of value innovation, like changing the traditional supply chain (e.g. new ways of cooperating with partners to combine different supply chains), or offering concepts instead of simple products. In doing so, hurdles like mistrust or old power games hinder companies in achieving full success. In their view, observing the end user and integrating this information into the company is of great importance. Leavy (2010, p. 5) sees the focus of value innovation in value creation and value capture, with concentration on the customer and not on competitors. He also stated that development of a technological breakthrough is not a necessity for value innovation, but nearly always an innovative business model. Zollenkop (2006, p. 138p) further explains that, within value innovation, the company questions existing customers and products/services and tries to depart from them. With the help of the value curve and benchmarking with alternatives on the market, the timing for new value innovations should also be determined. Thus, questions like which product functions should be deleted or added to create additional value are helpful in deciding when and what to change. Dillon et al. (2005, p. 23p) see the creation of an exceptional value for the customer as the objective of value innovation and in doing so, establishing a sustained increase in enterprise

value. Value innovation can, therefore, take place in product, service and delivery, as Kim and Mauborgne (1997; 1999) explained, and does not require a technological innovation. But Dillon et al. (2005, p. 24) stated that the potential of a technological innovation is not used without the corresponding value innovation.

Table 11 summarizes the main characteristics of these concepts and shows whether value innovation is seen as an incremental or radical change activity, performed continuously or discontinuously.

Author	Focus of change activities	IC	RC	CC	DC	Objectives of change activities
Kim and Mauborgne (1997), Kim and Mauborgne (1999)	- buyers value – product, service and delivery	.	✓	.	✓	- sustained high growth
Dillon et al. (2005)	- product, service and delivery	.	✓	.	✓	- exceptional value for the customer - sustained increase in enterprise value
Matthyssens et al. (2006)	- creation of new markets - reconfiguration of the BM - change of routines and processes, supply chain, offering	.	✓	.	✓	- new customer value - secure competitive advantage
Zollenkop (2006)	- customers, products/services	.	✓	.	✓	- new customer value
Leavy (2010)	- value creation and value capture	.	✓	.	✓	- competitive advantage

Table 11: Main characteristics of value innovation concepts

IC: incremental changes, RC: radical changes, CC: continuous change process, DC: discontinuous change process

As described, value innovation was mainly coined by Kim and Mauborgne (1997; 1999) and is comparable to strategic innovation, but with a clear focus on innovating the value offered to the customer in the sense of creating a new market. In value innovations, the value proposition is the main focus of innovation activities. The objective is to secure a competitive advantage by offering a new value for the customer, which may necessitate the reconfiguration of the business model. Value innovation can therefore be related to product innovation, which leads to the development of a new business area or the elimination of an existing one. (Mueller, 2014, p. 8)

5.3.2.3 Business Model Dynamics

The dynamics of a business model results from changes in the BM of a newly established company (Bouwman and Macinnes, 2006, p. 3; Reuver et al., 2007, p. 1; Reuver et al., 2009, p. 2; Willemstein et al., 2007, p. 222), but also from changes in the existing BM (Willemstein et al., 2007, p. 222; Cavalcante et al., 2010, p. 3; Cavalcante et al., 2011, p. 1328p). Reuver et al. (2007, p. 2) & Reuver et al. (2009, p. 3pp) explain that these changes are part of the *business model life cycle*, consisting of three phases: 1) development/R&D, 2) implementation/roll-out and 3) commercialization. They emphasize the necessity to review the BM during all these phases – from development to exploitation. In these phases, different exogenous factors influence the BM development and necessitate a change. These exogenous factors (see section 5.1) are part of the business model dynamics, emerging from the continuous reinvention of the BM, and can be present in every BM element. The results of their study are more applicable to small and start-up enterprises than to existing large companies, requiring a distinction between two.

For Mason and Leek (2008, p. 774) *“dynamic business models represent continuous change and therefore make firms learn constantly new and better ways of doing things”*. Dynamic business models are the result of established network structures around processes for structured problem-solving. Steady development of the BM originates from learning by employees as well as the management. Mason and Leek (2008, p. 775pp) define the knowledge transfer and co-creation capabilities of the company in the network as central factors in building and continuously developing a BM. The dynamic behavior of the BM results from constant sharing and improvement of know-how in the network in order to enhance structures and routines.

Schweizer (2005, p. 48) describes the interdependence between innovators and companies providing complementary assets as catalysts for the dynamics in a BM. In this situation, a company has to think about the role and steps it would take in the value chain. If the company, for example, occupies more steps in the value chain, the company can realize high revenue potentials, but has to be aware of high risks and costs. If the company wants to act more as an orchestrator, the risks and costs are lower, but the company can also realize high revenue potentials. In this way, it emphasizes the rising importance of collaboration with different companies in the value chain and thinking about outsourcing those activities not included in its core competencies.

Willemstein et al. (2007, p. 222) stated that the dynamics in a BM originate from two sources: From changes in the BM of newly founded companies over time or the BM changing due to emerging opportunities enabling a firm to grow. Changes in the business models are represented through diversification of activities and not a complete change; but specialization in specific activities is also possible. Cavalcante et al. (2010, p. 3pp) & Cavalcante et al. (2011, p. 1328p) see the dynamics of the BM in the change of the standard repeated core processes of the

company, driven by the ability of individuals to recognize the need for change and also the will to realize these changes. They further emphasized that a dynamic BM has to consist of static properties as well as flexible characteristics.

Table 12 summarizes the main characteristics of these concepts and shows whether changing the business model in these concepts is seen as an incremental or radical change activity, performed continuously or discontinuously.

Author	Focus of change activities	IC	RC	CC	DC	Objectives of change activities
Schweizer (2005)	- changes to the steps incorporated in the value chain	✓	✓	.	.	- increase revenue - remain competitive
Bouwman and Macinnes (2006), Reuver et al. (2007), Reuver et al. (2009)	- continuous reinvention of the business model and every element	✓	.	✓	.	- adapt to external drivers
Willemstein et al. (2007)	- change of the business model of newly established firms over time - shift from existing business model to another - changes in activities	✓	✓	✓	.	- firm's growth
Mason and Leek (2008)	- constant sharing and improvement of know-how with the network	✓	.	✓	.	- learning
Cavalcante et al. (2010), Cavalcante et al. (2011)	- changes through creation, addition, change or termination of processes	✓	.	✓	.	- change of the business model

Table 12: Main characteristics of concepts describing business model dynamics

IC: incremental changes, RC: radical changes, CC: continuous change process, DC: discontinuous change process

To summarize, dynamic business models are characterized by changes in the business model of a newly founded company (Bouwman and Macinnes, 2006, p. 3; Reuver et al., 2007, p. 1; Reuver et al., 2009, p. 2; Willemstein et al., 2007, p. 222), but also by changes in the existing BM (Willemstein et al., 2007, p. 222; Cavalcante et al., 2010, p. 3; Cavalcante et al., 2011, p. 1328p), resulting in a completely different model. The main characteristic of dynamic business models are continuous change activities relating to the entire BM and/or every single BM

element. Reuver et al. (2009, p. 3pp) describe this dynamic change as a BM life cycle, where different factors force changes in the BM. They describe it in the context of developing a BM in small and start-up enterprises. The objectives behind dynamic business models are adapting to external drivers, learning, and securing a competitive position. (Mueller, 2014, p. 8)

5.3.2.4 Business Model Evolution

Demil and Lecocq (2010, p. 235) describe two views of a BM: a *static view*⁷⁴ and a *dynamic view*⁷⁵. The dynamic view is represented by changes in and between elements influencing the entire BM. They explain that structural changes are a sign of business model evolution, e.g. changes in costs and/or revenue structure resulting from using or developing new resources, changing business processes or outsourcing value chain activities. Changes can be positive or negative, termed as virtuous or vicious cycles. With a combination of these changes, a sequence of changes can be created, with the result that the BM is “*permanently in a state of transitory disequilibrium*” (Demil and Lecocq, 2010, p. 235). This means that changing one element of the BM results in a change in other elements. Changing the BM and at the same time building and maintaining sustainable performance requires capabilities to balance these trade-offs, which Demil and Lecocq (2010, p. 241) described as *dynamic consistency*.

Sosna et al. (2010, p. 386) explain a dynamic perspective of business models starting with business development as an initial experiment that is further improved through trial-and-error learning. This trial-and-error learning leads to a change in the BM, which they presented in a longitudinal case study of Naturehouse. In their view, business model evolution is a learning process over time leading to changes in the BM.

Table 13 summarizes the main characteristics of these concepts and shows whether changing the business model in these concepts is seen as an incremental or radical change activity, performed continuously or discontinuously.

⁷⁴There is consistency of business model elements (Demil and Lecocq, 2010, p. 235).

⁷⁵The evolution of the business model (Demil and Lecocq, 2010, p. 235).

Author	Focus of change activities	IC	RC	CC	DC	Objectives of change activities
Demil and Lecocq (2010)	- changes in and between elements of the BM	✓	.	✓	.	- sustainability of organizational performance
Sosna et al. (2010)	- trial-and-error experimentation - value creation and exploitation	✓	.	✓	.	- improvement of developed BM

Table 13: Main characteristics of concepts describing business model evolution

IC: incremental changes, RC: radical changes, CC: continuous change process, DC: discontinuous change process

The focus of business model evolution is a continuous change process in the BM. Changes mainly comprise incremental adaptations of the BM and take place within single elements, but can further lead to a change of the entire BM. The goal is to adapt the existing BM in order to stay competitive. (Mueller, 2014, p. 8)

5.3.2.5 Business Model Reconfiguration, Reinvention and Flexibility

As already described, Massa and Tucci (2013, p. 12pp) explain *business model reconfiguration* as an architectural innovation (see section 5.3.1.1) in the form of “a systemic reconfiguration of existing organizational and technological capabilities” (Massa and Tucci, 2013, p. 15), changing the existing business model of incumbent firms. The changes can have any degree of radicalism possibly leading to BMI (see figure 26). Creativity and the ability to see and act on novel opportunities are important skills for business model reconfiguration.

Reinvention of the BM should be the answer to the Red Queen effect, as described at the beginning of this chapter, and is based on competitive environmental shifts as well as a shift in the main elements of the BM. As a means of doing so, Voelpel et al. (2003, p. 26p) & Voelpel et al. (2005, p. 37) proposed a four-dimensional sense-testing tool (see figure 29). The tool supports the development of a new customer value proposition, identification of the impact technological developments have on the customer value and the business network, new configuration of the business network, as well as an indication of how profitable the developed model is and whether it is economically feasible. Depending on the characteristics of different dimensions, the likeliness of BM reinvention is determined. BM reinvention is characterized as a continuous process responding to the rapidly changing business environment, requiring a visionary, creative and strong leadership. (Voelpel et al., 2003, p. 32)

Mason and Mouzas (2012, p. 1342pp) explain the need for *flexibility* in business models in

5.3 Concepts for Changing the Business Model

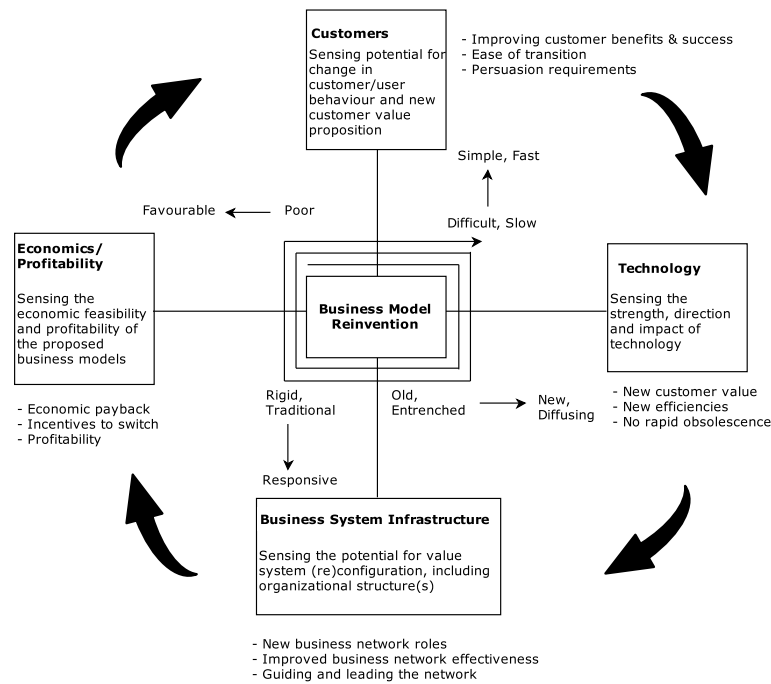


Figure 29: Wheel of business model reinvention (referring to Voelpel et al., 2003, p. 26)

the context of a business network between the company and its downstream customers and upstream suppliers. Flexibility is seen as a *capability* in integrating customer needs as well as gaining access to resources from suppliers without owning them. This calls for the company to change and adapt easily. Flexible BM elements can be identified at three levels: The network level, the firm level and the individual employee level. They further emphasize that business models have to be flexible and adaptable in order to facilitate innovation. Mason and Mouzas (2012, p. 1342pp) identified two variables each consisting of several elements to explain the flexibility of business models. These two variables are the *business model architecture* (e.g. position of the company in the network) and the *business model focus* (the objective of the BM). In total, Mason and Mouzas (2012, p. 1361pp) revealed four areas that help to build business models more flexibly:

- Flexible business models through *network architectures*: This incorporates flexible re-alignment of the company network because of constantly changing customer needs. In order to attract customers in over-supplied markets, it is important to have flexible product and service offerings.
- Flexible business models through *market integration*: Downstream integration is required for flexibility. Co-operation with key customers as well as collecting and sharing data to maximize joint assets between firms are central to all routines.

- Flexible business models through *co-ordination*: Inter-functional co-ordination crossing company boundaries is required for flexibility. Thus, structures are needed to connect network members as well as routines and processes supporting these structures. Communication technologies play a key role in knowledge-sharing between partners.
- Flexible business models through *business relationships*: flexibility is achieved through avoidance of corporate ownership upstream. The greatest flexibility can be achieved through sourcing of commodities via transactional relationships. Purchases are mainly made on the basis of cost and quality.

Nair et al. (2011, p. 2) see flexibility as “*the ability and capacity to reposition resources and functions of the organization in a manner consistent with the evolving strategy of management as they respond, pro-actively or reactively, to change in the environment.*” In order to be flexible, the right competencies are needed and have to be strengthened to provide the required flexibility if necessary. Nair et al. (2011, p. 4) introduce a BM with a flexibility and adaptability layer, providing a means of retaining or boosting business performance by analyzing, benchmarking, acquiring and strengthening competencies. A decrease in business performance does not happen drastically because flexible business practices and a smooth phase of adaptation help to acquire the competencies needed to overcome uncertainties. As soon as the acquired competencies are strengthened and assimilated into the business model, business performance increases again.

Table 14 summarizes the main characteristics of these concepts and shows whether changing the business model in these concepts is seen as an incremental or radical change activity, performed continuously or discontinuously.

Author	Focus of change activities	IC	RC	CC	DC	Objectives of change activities
Massa and Tucci (2013)	- reconfiguration of organizational and technological capabilities	✓	✓	✓	✓	- better performance by the firm
Voelpel et al. (2003), Voelpel et al. (2005)	- shift in competitive environment - shift in main elements of the business model	.	✓	✓	.	- avoid the Red Queen effect
Nair et al. (2011)	- repositioning of resources and functions - strengthening of competencies	✓	.	✓	.	- respond to changes in the environment - increase business performance

Author	Focus of change activities	IC	RC	CC	DC	Objectives of change activities
Mason and Mouzas (2012)	<ul style="list-style-type: none"> - business model architecture - business model focus 	✓	.	✓	.	<ul style="list-style-type: none"> - respond to evolving customer demands - best possible utilization of network resources

Table 14: Main characteristics of BM reinvention/reconfiguration/flexibility concepts

IC: incremental changes, RC: radical changes, CC: continuous change process, DC: discontinuous change process

Only some literature was found on the concepts of business model reconfiguration, business model reinvention and business model flexibility. Massa and Tucci (2013, p. 12pp) explained that business model reconfiguration can have any degree of change – from minor improvements to radical innovations. The main focus is the reconfiguration of resources to achieve better performance. The business model reinvention described by Voelpel et al. (2003, p. 26p) should help companies to look beyond the current situation and find new ways of competing. Reinventing the BM is based on a competitive environmental shift as well as a shift in the main elements of the BM. When reinventing the BM, the change seems to be of a radical nature because Voelpel et al. (2003, p. 26p) & Voelpel et al. (2005, p. 37) encourage going beyond incremental improvements with the application of their proposed “sense-testing tool”. However, the regular application of this sense-testing tool creates a continuous improvement process, as in dynamic business models. Business model flexibility entails the challenge of developing capabilities in the BM in order to respond to external changes; also internal decisions regarding how best to use the network resources available need to be considered. Mason and Mouzas (2012, p. 1342pp) identified several areas that should provide flexibility in the BM (e.g. through flexible re-alignment of the company network). Nair et al. (2011, p. 4) introduced their own flexibility layer to the BM, which analyses, benchmarks, acquires and strengthens the competencies needed to retain or boost business performance. Especially the description of Mason and Mouzas (2012) seems to incorporate every type of change, whereas the change initiatives described by Nair et al. (2011) appear more continuous and incremental. (Mueller, 2014, p. 8p)

5.3.3 Comparison of the Concepts

In the previous sections, the different concepts of business model change were introduced, compared and discussed. Now, the differences and similarities between the concepts are to be highlighted and business model innovation clarified in more detail.

5.3.3.1 Differences and Similarities between the Concepts

To highlight the differences and similarities between the concepts presented, the main characteristics are summarized in table 15 and an attempt is made to present the classifications graphically. Figure 31 classifies the concepts according to the *frequency* of change activities – are they seldom and discontinuous or frequent and continuous – and to the *result* obtained by the change concept – incremental improvement or radical change of the BM. In addition, figure 30 classifies the different change concepts according to the main discussions in the BM literature: the *intensity* of BM change activities – are they just minor improvements or are they of a radical nature, as well as the *scope* of changes accomplished in the BM – a small scope means that only single BM elements are changed and a large scope indicates that many or all elements are changed and, therefore, the BM is completely new. (Mueller, 2014, p. 9)

Concept	Focus of change activities	IC	RC	CC	DC	Objectives of change activities
Business model innovation	<ul style="list-style-type: none"> - change of various business model elements - development of a new business model - improvement of the existing business model 	✓	✓	(✓)	✓	<ul style="list-style-type: none"> - growth opportunities - (sustainable) competitive advantage
Strategic innovation	<ul style="list-style-type: none"> - business model change - focus on customer base, customer value/offering, value creation 	.	✓	.	✓	<ul style="list-style-type: none"> - change the rules of the game/existing competition
Value innovation	<ul style="list-style-type: none"> - create a new market - new value proposition 	.	✓	.	✓	<ul style="list-style-type: none"> - secure the competitive advantage - new value for the customer
Dynamic business models	<ul style="list-style-type: none"> - business model changes - mainly processes and activities 	✓	(✓)	✓	.	<ul style="list-style-type: none"> - adapt to external changes - remain competitive
Business model evolution	<ul style="list-style-type: none"> - changes of business model elements - trial-and-error 	✓	.	✓	.	<ul style="list-style-type: none"> - increase firm's performance
Business model reinvention/reconfiguration	<ul style="list-style-type: none"> - (continuous) change of business model elements/architecture 	✓	✓	✓	✓	<ul style="list-style-type: none"> - increase firm's performance

Concept	Focus of change activities	IC	RC	CC	DC	Objectives of change activities
Business model flexibility	<ul style="list-style-type: none"> - change of business model elements and architecture - strengthening of competencies to be flexible 	✓	✓	✓	✓	<ul style="list-style-type: none"> - respond to changes in the environment - increase firm's performance

Table 15: Main characteristics of business model change concepts (Mueller, 2014, p. 6)

IC: incremental changes, RC: radical changes, CC: continuous change process, DC: discontinuous change process

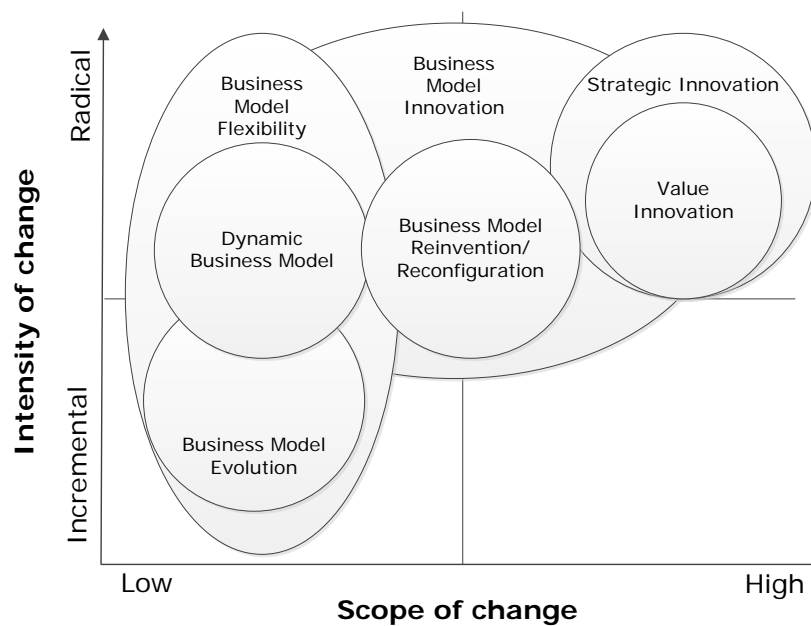


Figure 30: Classification according to the intensity and scope of business model change (Mueller, 2014, p. 9)

As presented in figure 31, changes in the BM are usually discontinuous activities with incremental and radical new outcomes. Strategic innovation, value innovation and also BMI are radical ways of changing the BM because the shifts are new to the company and very often also new to the industry. Both strategic innovation and value innovation are radical ways of changing the competition and the company; value innovation focuses on the value proposition that is embodied in BMI. BMI is not restricted to one change in a specific element; instead, it comprises several of the changes. This clearly distinguishes BMI from value innovation and also strategic innovation. Furthermore, BMI is often equated to strategic innovation and is, therefore, seen at least as part of strategic innovation. Zollenkop (2006, p. 140) explains the difference between value innovation and strategic innovation by pointing out that value

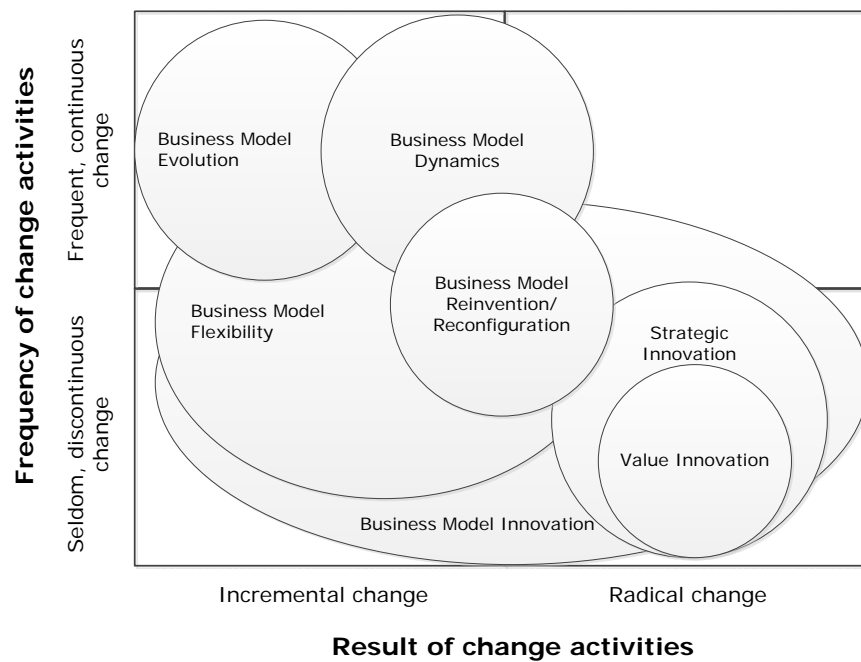


Figure 31: Classification according to the result and frequency of business model change (Mueller, 2014, p. 10)

innovation is entirely product-related, whereas strategic innovation also comprises the new strategic position of the company. (Mueller, 2014, p. 9p)

However, changing the BM is also seen as a continuous change process (see figure 31). Dynamic business models or business model evolution clearly describe this continuous change process, but also business model flexibility, business model innovation or business model reinvention/reconfiguration involve continuous change activities. These concepts focus on the constant and frequent adaptation of the BM, triggered by external changes and opportunities as well as internal decisions. Business model flexibility seems to be a discontinuous as well as a continuous change activity with incremental outcomes. There are, therefore, similarities to BMI here. The concepts of business model reconfiguration and reinvention cannot be clearly described because the possibilities range from radical shifts to minor improvements. The characteristics, especially of business model reconfiguration, are discontinuous change activities, but continuous change activities are not excluded. By comparing business model flexibility, reinvention and reconfiguration, it is clear that business model flexibility focuses additionally on the capabilities a company needs to respond to changing requirements. Business model reconfiguration, and especially business model reinvention seem to be more explanatory processes for changing the BM. Besides external events triggering changes, business model flexibility also emphasizes proactive actions provoked by the company itself, with the goal of responding to changes in the environment and increasing the firm's performance. (Mueller,

2014, p. 10p)

It can be summarized that the differences between continuous and discontinuous change concepts are the objectives of the change activities. Continuous change activities focus on increasing the firm's performance, whereas concepts of discontinuous change have the goal of changing the existing competition in order to secure a competitive advantage. Also, the newness of the change activities can be highlighted as a distinction between the concepts, as underlined in the preceding paragraphs. (Mueller, 2014, p. 11)

5.3.3.2 Clarification of the Business Model Innovation Concept

By comparing BMI with the other concepts, it becomes evident that it more or less overlaps with every single concept, as is also shown in figures 31 and 30. By collating BMI with strategic innovation and value innovation, it is possible to deduce that BMI substantiates and implements the decisions of a strategic innovation initiative, where the direction for new business models is set. It can, therefore, be concluded that the development of a new BM is the main focus of strategic innovation. Value innovation focuses on innovating the offering – the value proposition in the company – and is therefore part of BMI, as Zollenkop (2006) also describes. Viewing BMI as a radical, discontinuous change initiative, it is part of strategic innovation and encompasses value innovation itself. As BMI also embodies incremental changes, it intersects with business model reinvention/reconfiguration, business model flexibility and also business model dynamics and evolution. The main differences between these concepts are the objectives of change activities: Business model flexibility and business model reinvention/reconfiguration have the goal of increasing company performance as a result of changes in the environment, whereas BMI includes usually substantial changes to secure a competitive advantage. (Mueller, 2014, p. 11)

The focus of BMI lies on changing an existing BM, mainly by incremental improvements. Mason and Mouzas (2012, p. 1342pp) state that flexibility is needed to facilitate innovation. It is concluded, therefore, that a flexible business model can lead to BMI. The main difference is between BMI and business model dynamics and evolution as these concepts describe continuous change activities. Although Najmaei (2011) and Zhang et al. (2010) characterize BMI as a continuous change process, this is not a common perception of this concept. (Mueller, 2014, p. 11)

As the literature review and the discussion show, there are topics that make it possible to distinguish business model innovation from the other concepts; but the existing overlapping topics exacerbate this distinction. This difficulty in separation is especially present in business model innovation. Sometimes it seems that the designation of the concept described has been chosen randomly, resulting in a lack of clarity and distinction. (Mueller, 2014, p. 11p)

5.4 Capabilities to Change the Business Model

A suitable organizational environment is crucial to the development of a new BM. Creativity and innovation should be “*an outcome of a company-wide capability*”, including ideas and different viewpoints of people in the organization as well as of additional stakeholders. The environment established should also enforce *self-organization* through a shared vision of the organization and some degree of chaos responsible for creativity to facilitate self-learning and encourage risk-taking. (Voelpel et al., 2003, p. 21pp) Voelpel et al. (2003, p. 23) also suggest *systemic strategy thinking* in order to understand that value creation takes place within the business ecosystem. This stresses the significant role of the business network in changing the BM, but also the pertinence of organizational capabilities. The development of new business models requires the capability to develop completely new ways of differentiating from existing business models (Hamel, 2001, p. 83).

Dottore (2009, p. 496) proposes different characteristics that are needed in order to have the ability to change:

- A *pro-active and reactive* approach needs to be pursued.
- All *relevant information* has to be gathered and processed on time.
- *Decision-making* has to be conducted within a given time constraint.
- The *top-management team* should consist of the entrepreneur, the entrepreneurial team or the senior staff.
- There must be a suitable *flow of information and knowledge* between the marketplace and decision-makers in the company.
- *Communication channels* should be constructed in an open way.
- There must be an “*ability to change and improve*”.
- There must be a possibility to *change continuously or semi-continuously, but also discontinuously or in a revolutionary manner*.

Several capabilities necessary for value innovation are explained by Matthyssens et al. (2006, p. 759p). *Sensing the market* is a pre-condition for value innovation. In order to better identify customer needs, the method of *knowledge generation* has to change. *Learning* takes on considerable importance, especially together with key accounts and innovative network partners. Besides learning, *unlearning* of existing knowledge is important as well. This should encourage the openness of the company and processes for acquiring new knowledge. However, unlearning is not only required in companies, it is also important for entire industries. As value creation encourages transformation of the offering, which is very often conducted together with partners, *marketing skills* are required as well to exploit the new offering.

Doz and Kosonen (2010, p. 371pp) stress the importance of *strategic agility* for renewal of the business model. Strategic agility is seen as interplay between three meta-capabilities – strategic sensitivity, leadership unity and resource fluidity. Each of these three meta-capabilities can be explained through five dimensions, representing the actions a leader should take to renew the BM:

- *Strategic sensitivity*: To strengthen the strategic sensitivity, strategic foresight should help to improve the BM in a targeted manner. Experimenting with the changed business models helps to strengthen assumptions and achieve greater success when implementing it in the company. In order to facilitate future possibilities, it is proposed to create a distance to day-to-day business and use an outside-in perspective. Furthermore, the description of an abstract BM that is not bound to a specific context may also help to recognize new business opportunities and transfer them to different contexts. The results of actions taken should be a re-framing of the existing BM as well as the development of different BM possibilities.
- *Leadership unity*: Leadership unity requires the top management to talk about a change in the BM, share their opinions and reach a collective commitment. Besides this, personal opinions of every person involved, the alignment of interests and the designation of a person to attend to the BM are just as important as the establishment of interdependencies between teams and sub-units in the company.
- *Resource fluidity*: Resource fluidity fosters structural agility through different actions. In order to be flexible, tightly coupled elements of the BM should be disconnected. The modularization of underlying business systems should also support fast changing of the BM⁷⁶. In order to encourage structural flexibility, resource ownership and resource use in business, systems and strategy need to be separated. Switching between different business models can help to develop radical differentiation by assigning products and market segments in a flexible way. The acquisition of a different BM and its integration into existing operations can also be a trigger for changing the existing BM.

Gassmann et al. (2013, p. 67pp) list different capabilities necessary to successfully implement an innovative BM on the market. First of all, the *right team* has to be selected and it must be interdisciplinary in order to integrate several perspectives. Furthermore, a decision must be taken on where to source any capabilities lacking to implement the BM⁷⁷. An important success factor in change activities is the *corporate culture*. Without an open culture and the willingness to change, BMI will not be successful.

For Hamel and Välikangas (2003, p. 53), *strategic resilience* is the answer for companies in

⁷⁶See section 2.2, where modularity was listed as a concept related to flexibility.

⁷⁷This can be realized through developing the capabilities lacking, entering into a partnership or buying capabilities or new businesses. (Gassmann et al., 2013, p. 68p)

turbulent environments, explaining resilience as “*the ability to dynamically reinvent business models and strategies as circumstances change*”⁷⁸. Strategic resilience is not a one-time response to the crisis, but instead it is a constant adjustment to trends and developments that may hurt the main business of the company; it is the capacity of the organization to change before these developments hit the organization. In order to become resilient, the company needs to address four challenges – the cognitive, the strategic, the political and the ideological challenge. To overcome the *cognitive challenge*, companies have to conquer denial by facing the required changes and reducing the time available for change. The *strategic challenge* has to deal with variety; companies must think about different variants (e.g. product variants) in order to become resilient. If variety exists, the reaction to perturbations can be much stronger. The *political challenge* has to deal with resources. Resilience requires the reallocation of resources in the company. This is a political process because it is common to invest resources in “what is” than in “what could be” because new things often seem too risky. However, by investing in existing programs, companies stuck in operational resilience then accelerate strategic resilience. This leads us to the *ideological challenge*, where the company has to leave behind operational resilience and needs to invest in capabilities for strategic resilience. In summary, companies need to be aware of the ongoing developments in the environment and generate a variety of strategic options and free resources faster than competitors do. This will provide an advantage over companies not able to do this. (Hamel and Välikangas, 2003, p. 54pp)

Besides the development of capabilities for strategic sensitivity or strategic resilience, several other capabilities were identified enabling and encouraging the change of the business model (see table 16). Most of the capabilities explained deal with *sensing* opportunities and threats in the environment, *seizing* these opportunities and *reconfiguring* the business model accordingly. As a result, such capabilities as experimentation, variant development or learning are important. These capabilities can be summarized as *dynamic capabilities* and are highlighted in more detail in the next section. Managers also play a key role when it comes to BM changes (see section 5.4.2). Their activities include monitoring risks, making decisions or taking actions, but an especially important aspect is good leadership when facing situations of change. Closely connected to dynamic capabilities and management capabilities is the corporate culture. Managers make an important contribution towards developing the appropriate culture and climate in the organization; thus, the corporate culture is considered in connection with dynamic capabilities and management capabilities.

⁷⁸Resilience was also listed as a concept related to flexibility in section 2.2

Capabilities	Detailed description	Representatives
Strategic agility/Strategic resilience	<ul style="list-style-type: none"> - Strategic sensitivity (e.g. strategic foresight, experimenting, developing different BM possibilities) - Leadership unity (e.g. communicate change, achieve a collective commitment, involve people) - Resource fluidity (e.g. structural agility, modularization, acquisition of a BM) - Variant development (e.g. product variants) - Invest in capabilities for strategic resilience 	Hamel and Välikangas (2003), Doz and Kosonen (2010), Gassmann et al. (2013)
Sensing, seizing and reconfiguration	<ul style="list-style-type: none"> - Sensing capabilities to identify opportunities and threats (explorative learning is important) - Seizing capabilities to address and exploit opportunities (exploitative learning is important) - Reconfiguration capabilities to design and adapt organizational structures, activities and resources 	Schweizer (2005), Matthyssens et al. (2006), Teece (2007), Dottore (2009), Teece (2010), Najmaei (2011), Achtenhagen et al. (2013), Mezger (2013), Roaldsen (2014), Saebi (2014)
Corporate culture	<ul style="list-style-type: none"> - Learning-oriented culture - Open culture - Willingness to change 	Najmaei (2011), Achtenhagen et al. (2013), Gassmann et al. (2013)
Management and leadership capabilities	<ul style="list-style-type: none"> - Monitor risks and uncertainties - Be aware of consequences of change - Take actions for change - Preserve the present, deconstruct the past, and selectively forget it and create the future - Commitment to change activities - Involve employees in change - Identify people driving the change - Be patient - Be able to implement the new business model 	Deschamps (2005), Demil and Lecocq (2010), Najmaei (2011), Govindarajan and Trimble (2011), Gassmann et al. (2013)

Table 16: Capabilities necessary to change the business model

5.4.1 Business Models and Dynamic Capabilities

Strategic inertia and the established resource base of the company may be barriers to changing the existing BM. Companies fail to recognize opportunities for the BM, fail to develop a BM to pursue opportunities emerging or fail to reconfigure the organization in terms of processes,

structures and activities. Dynamic capabilities must be developed in order to establish an important framework to support companies in changing their resources base and procedures for value creation and value capture when facing situations of change. As value creation and value capture are elements of the BM, dynamic capabilities are also relevant when changing the BM. (Najmaei, 2011, p. 167; Mezger, 2013, p. 2p) Several scholars have already linked BMI and dynamic capabilities, as presented by a few studies (e.g. Dottore, 2009; Najmaei, 2011; Mezger, 2013). Before investigating the correlation of dynamic capabilities and business model change, the concept of dynamic capabilities is presented in order to provide the main idea behind this concept.

5.4.1.1 The Concept of Dynamic Capabilities

Dynamic capabilities are needed to change a company's way of living in order to survive and prosper under constantly changing conditions (Helfat et al., 2007, p. 1). These are an advancement of the resource-based view because the resource-based view is criticized as being too static; dynamic capabilities are seen as the dynamic view of a company's resources. Teece et al. (1997) mainly contributed to development of the concept by providing one of the first definitions: Dynamic capabilities are *"the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments"* (Teece et al., 1997, p. 516). In their view, the dynamism is determined by the capacity of the organization to renew its competencies according to the changing business environment. Capabilities are seen as *"the role of strategic management in appropriately adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competences to match the requirements of a changing environment."* (Teece et al., 1997, p. 515) Teece et al. (1997, p. 524) emphasize that *non-imitability* of routines, skills and complementary assets is relevant in securing a competitive advantage for the company. Organizational processes are the essence of dynamic capabilities and their competitive advantage and are characterized by company-specific assets as well as paths that have influenced the company in the past and will influence decisions on strategic alternatives in the future. (Teece et al., 1997, p. 518pp)

Besides Teece et al. (1997), further researchers have investigated dynamic capabilities. Eisenhardt and Martin (2000, p. 1107) describe dynamic capabilities as *routines* that support firms in the reconfiguration of their resources in response to emerging, colliding, dividing, evolving or dying markets. Product development or strategic decision-making are examples of dynamic capabilities. These routines are different in every company because dynamic capabilities can be built in a different way, but may still lead to the same results, which Eisenhardt and Martin (2000, p. 1109) designate as *equifinality*. Wang and Ahmed (2007, p. 10) state that dynamic capabilities are not only processes, but are also *embedded in processes*. They further distinguish between three components of dynamic capabilities that have a long-standing empirical and

conceptual definition and research of their own: adaptive capabilities⁷⁹, absorptive capabilities⁸⁰ and innovative capabilities⁸¹. It is said that the more innovative the company is, the more dynamic capabilities it possesses. (Wang and Ahmed, 2007, p. 13pp)

Dynamic capabilities have to be distinguished from *ad hoc problem-solving*. Changes that are non-repetitive and have no specific behavior do not require dynamic capabilities; instead, they are indications of ad hoc problem-solving. Ad hoc problem-solving is appropriate if “firefighting” is needed as a result of possible changes in the environment or unpredictable events. However, such routines as product modification also need a certain degree of ad hoc problem-solving. Thus, there is often no pure form of dynamic capabilities or ad hoc problem-solving, but rather a mixture of the two. It is also a matter of costs that companies have to be aware of. Dynamic capabilities need to be established and exercised, resulting in some costs. In comparison, ad hoc problem-solving capabilities only involve costs if they are needed and/or used. (Winter, 2003, p. 992pp)

Dynamic capabilities encompass the capacities to identify opportunities for change, to develop a response to these opportunities and implement these changes in the company (Helfat et al., 2007, p. 1pp). This corresponds to the three capacities of dynamic capabilities described by Teece (2007, p. 1319p). *Sensing and shaping opportunities* force a company to establish activities like scanning, creating, learning and interpreting technologies and markets. Furthermore, companies need to understand “latent demands”, how industries and markets may evolve in the future and how likely it is that suppliers and competitors will respond. Appropriate abilities are necessary in the form of processes to uncover these opportunities in the business ecosystem. *Seizing the opportunity* entails thinking about new products, services or processes. Thus, there is a need to improve technological competencies and additional assets. Issues like *when* and *how much* to invest or the establishment of an appropriate BM, to name but a few, must be considered. It is also important to build loyalty and commitment through leadership, communication and factors like culture. *Reconfiguration* is needed to further develop and eliminate undesired path dependencies. Departing from developed routines very often evokes anxiety unless rooted in the organizational culture. In order to ensure sustainability of dynamic capabilities, the leadership skills of the top management are important. Additional factors are organizational structures, specialization, knowledge management and learning. (Teece, 2007, p. 1322pp)

The characteristics of dynamic capabilities depend on the dynamism of the market. Eisenhardt and Martin (2000, p. 1110pp) classified them according to moderately dynamic and high-

⁷⁹Adaptive capabilities are defined as the ability of a firm to “*identify and capitalize on emerging market opportunities*”. The main task of adaptive capabilities is to “*align internal organizational factors with external environmental factors*”. (Wang and Ahmed, 2007, p. 13pp)

⁸⁰Absorptive capabilities are abilities to identify new, valuable external information, absorb this information and apply it to a commercial end. (Wang and Ahmed, 2007, p. 13pp)

⁸¹An innovative capability is the ability to develop new products and/or markets. This is realized through a strategic innovative orientation combined with innovative behavior and processes. (Wang and Ahmed, 2007, p. 13pp)

velocity markets. This classification results in *hierarchies* or *types* of dynamic capabilities. The first person to propose such categories was Collis (1994). His four distinct categories are the resource base of the firm (first category), the dynamic capabilities (second and third categories), meta-capabilities explained as *learning-to-learn capabilities* and the final category as meta-capabilities extending *ad infinitum*, corresponding to an infinite appearance of capabilities which renew capabilities that renew capabilities (Ambrosini et al., 2009, p. S12). Other researchers build on these ideas. According to Collis (1994), the first level is first-order capabilities (Danneels, 2002, p. 1112), i.e. zero-level capabilities (Winter, 2003, p. 992) or substantive capabilities (Zahra et al., 2006, p. 921) in the form of tangible and intangible resources required to manufacture the products (Danneels, 2002, p. 1112; Ambrosini et al., 2009, p. S14p) or capabilities for problem-solving⁸². Second-order capabilities (Danneels, 2002, p. 1112) or first-order capabilities (Winter, 2003, p. 992) are capabilities responsible for identifying, evaluating and integrating new customer- or technology-related competencies (Danneels, 2002, p. 1112) or changing the product or production processes (Winter, 2003, p. 992). Zahra et al. (2006, p. 921) describe these capabilities as dynamic capabilities changing substantive capabilities⁸³. Ambrosini et al. (2009, p. S14p) distinguish here between incremental dynamic capabilities and renewing dynamic capabilities.

<i>Collis (1994)</i>	<i>Danneels (2002)</i>	<i>Winter (2003)</i>	<i>Zahra et al. (2006)</i>	<i>Ambrosini et al. (2009)</i>
First category	First-order capabilities	Zero-level capabilities	Substantive capabilities	Resource base
Second and third categories	Second-order capabilities	First-order capabilities	Dynamic capabilities	Incremental dynamic capabilities Renewing dynamic capabilities
Meta-capabilities		Higher-order capabilities		Regenerative dynamic capabilities
<i>Ad infinitum</i> Meta-capabilities				

Table 17: Different hierarchies of dynamic capabilities (referring to Ambrosini et al., 2009, p. S17)

⁸²e.g. a new means of product development (Zahra et al., 2006, p. 921).

⁸³e.g. change the capability of product development (Zahra et al., 2006, p. 921).

5.4.1.2 Dynamic Capabilities to Change the Business Model

The need for dynamic capabilities to change the business model is an upcoming and in the meantime common topic in scientific communities. Schweizer (2005, p. 51) explains that a “*dynamic capability can be considered as the ability to seize new opportunities and to change the existing business model by reconfiguring the value chain constellation and protecting knowledge assets, competences and (the access to) complementary assets and technologies in order to achieve sustainable competitive advantage*”. This dates back to the explanations of dynamic capabilities by Teece et al. (1997). Teece (2010, p. 190) indicates business models as the “*key micro-foundation of dynamic capabilities*”. Sensing, seizing and reconfiguring skills should provide the opportunity to adapt according to changing business requirements. The assessment of the BM is bound to the environmental context. In doing so, the business environment is seen as a variable that can be selected and shaped by the company, but also vice versa. *Creating, adjusting, improving and replacing* a BM are capacities forming the basis of dynamic capabilities. In order to increase the success of the designed BM on the market, the company must analyze various alternatives, have a good understanding of customer requirements, a precise understanding of the value chain to deliver what customers need as cost effectively as possible and on time, and should also have a neutral perspective on outsourcing. (Teece, 2007, p. 1130)

Several scholars built on the research of Teece (2007, 2010) by highlighting the importance of dynamic capabilities in changing the BM. Dottore (2009, p. 491p) compares varying definitions of dynamic capabilities in relation to a business model (adaptation). He states that the *ability to adapt* the BM can be seen as a dynamic capability. Dottore (2009, p. 492p) emphasizes the balance between dynamic and substantive capabilities; a disproportional use of either dynamic or substantive capabilities makes it difficult to implement the other one. Thus, companies need to find the right balance between these capabilities as this balance helps them to survive and succeed in a dynamic environment.

According to the explanations of Teece (2007), *sensing, seizing and reconfiguration* were also reported as important capabilities when it comes to changes in the BM. *Sensing capabilities* are needed to identify opportunities and threats to the BM and *seizing capabilities* are required to address and exploit these opportunities in the BM. *Reconfiguration capabilities* are needed to design and adapt organizational structures and activities as well as resources to facilitate the implementation of the new BM. (Dottore, 2009, p. 491p; Mezger, 2013, p. 6pp) Mezger (2013, p. 6pp) further revealed that sensing capabilities are important to detect technological and market developments, and analyzing business models in other industries helps learn about the problems and challenges they are facing. Thus, absorptive capacities are necessary in the form of explorative learning. Seizing capabilities are reflected in *transformative and exploitative learning processes* by re-combining knowledge on customers, markets and technologies used to develop the new BM. Sensing and seizing capabilities are characterized by their high interaction.

The reconfiguration capability requires companies to change their activity system, structures, and governance. Decisions on new resources required or the replacement of existing ones are important and stress the need for capabilities to integrate partners into the BM.

Najmaei (2011, p. 167) defines dynamic capabilities as *meta-capabilities* for BMI based on strategic learning. He also stresses the active role the manager has to play in building, integrating and reconfiguring the company's capability base. Dynamic capabilities are required to enhance the company's own value system in order to outperform competitors and reconfigure resources and processes integrated into value creation and capture. Najmaei (2011, p. 167p) therefore suggests that the management should establish a *strategic learning system* to systematize needs and directions for change. Furthermore, in-depth knowledge of the company's resource base is required in order to identify needs for change and the importance of setting strategic objectives for BMI. These objectives are necessary in order to lead the process of development and employment of the required dynamic capabilities.

Instead of dynamic capabilities, Achtenhagen et al. (2013, p. 429pp) speak about *critical capabilities* necessary to “*shape, adapt and renew*” a BM for sustainability. Saebi (2014, p. 16pp) explains that companies need to be prepared for changes in the BM and need, therefore, to develop dynamic capabilities. They designate this preparedness as the need to develop a “*business model change capability*” in order to change the BM and overcome core rigidities in the existing BM. Different dynamic capabilities are needed depending on the type of BM change⁸⁴. In business model evolution and adaptation, dynamic capabilities in the form of *evolutionary capabilities*⁸⁵ or *adaptive change capabilities*⁸⁶ are necessary to change operating capabilities and resources on a continuous basis. In contrast, business model innovation requires *meta-capabilities* in the form of *innovative adaptive capabilities*⁸⁷, as explained by Collis (1994), because the way of doing business is altered and, therefore, dynamic capabilities are changed as well.

Several other examples of dynamic capabilities to change the BM are reported in the literature. These include intra-management cooperation routines, collective learning, advantage-seeking capabilities, trust-advancing capabilities, operational process updating, experimenting and exploiting business opportunities, a balance in use of resources or the coherence between

⁸⁴They distinguished in their study between business model evolution, business model adaptation and business model innovation.

⁸⁵Evolutionary change capabilities are required to change a few parts of existing business models. Thus, an understanding is necessary of the existing BM, how it operates and the relationships between the elements. (Saebi, 2014, p. 20)

⁸⁶Adaptive change capabilities are needed in order to align the business model to changes in the environment through “*routines, processes and incentives that facilitate adaptation activities on a continuous basis*”. Thus, organizational agility, exploitive learning processes, strategic flexibility and boundary-spanning processes to renew the resource basis are required. (Saebi, 2014, p. 21pp)

⁸⁷Innovative change capabilities are needed to innovate the business model. They are seen as the “*firm's capacity to innovate its business model in response to conditions of environmental shifts*”. Learning processes in order to explore innovation are, therefore, necessary. (Saebi, 2014, p. 23pp)

leadership, organizational culture and employee commitment. (Achtenhagen et al., 2013, p. 429pp; Roaldsen, 2014, p. 359pp)

The discussion presented in the literature highlights the importance of developing dynamic capabilities in sensing market or technological opportunities, exploiting these opportunities by changing the business model and preparing the organization according to the new direction. Learning plays an important role here when the company needs to learn about problems and challenges in the industry or establishes learning processes to re-combine existing knowledge. Thus, the management needs to establish the appropriate organizational environment to enable recognition and pursuit of new directions.

5.4.2 Management and Leadership Capabilities to Change the Business Model

Changing the BM is a managerial task, which is why managers play a key role when it comes to BM changes. The CEO has to be aware of the importance of changing the BM in order to better serve customers and other stakeholders. (Mitchell and Coles, 2003, p. 20). Management tasks span the sensing and seizing of opportunities and threats and preparing the organization for this, but also play a key role in eliminating barriers to change and enhancing the opportunity to implement the new BM successfully. However, managers themselves can be a barrier to change as well if they are not able and willing to change the existing BM. (Gassmann et al., 2013, p. 56pp; Massa and Tucci, 2013, p. 13pp) The importance of a strong leadership when changing the BM was also revealed in the study by KPMG International (2006, p. 59pp), emphasizing how significant it is to discuss openly with all employees and commit towards the new direction. By proposing different leadership skills for different innovation strategies, Deschamps (2005, p. 35pp) explained that the implementation of a new business model requires a “*pragmatic architect*” who is able to define the operating system in full detail and possesses project management skills. When changing or improving only the product or the customer value, the commitment of the management to the new product or a rich knowledge of unfulfilled market needs are important leadership skills.

In order to cope with changes in the BM, Demil and Lecocq (2010, p. 241) propose three main tasks that managers have to fulfill:

- Permanently *monitor risks and uncertainties* that may have an impact on the BM. Thus, there is a need to analyze the business environment as well as internal developments and changes.
- *Looking ahead to possible consequences* of external or internal changes. A detailed view of developments should be established with systemic, circular and iterative thinking.

- *Establishing deliberate actions* to promote the consistency between BM elements to achieve or increase performance of the organization. The managers' role is to maintain the *dynamic consistency* between elements, i.e. the capability to coordinate between BM-fit and BM-change. This is achieved through active BM changes by managers, either incremental or radical, to ensure consistent alignment and balance between BM-fit and BM-change.

Also, Govindarajan and Trimble (2011, p. 110p) describe three tasks that CEOs have to fulfill in order to sustain the capacity to compete and remain successful. These tasks comprise *the preservation of the present situation*, *destruction of the past* and selectively forgetting it, and *the creativity to create the future*. Finding a balance between these tasks is important, where daily performance is considered to be as important as continuous improvement. Govindarajan and Trimble (2011, p. 111pp) highlight the importance of three topics in their example of "Infosys" through changes made there: *Strategy-building, accountability and organizational design*. These topics take different forms within the three different tasks. For example, the organizational design can be aligned well at the moment, but when creating the future, this can change completely due to the creation of sub-units from zero-base or existing structures that cannot be transferred automatically to the new sub-unit.

Important issues the management has to consider when it comes to changes in the BM are proposed by Gassmann et al. (2013, p. 56pp). They also see leadership as an important success factor for BM changes. First of all, managers need to show their *commitment* towards the change and all activities undertaken relevant to the new BM. Without the commitment of the management, the innovation of the BM will not be successful. Second, *employees need to be involved* in all change activities, for example by designing their own processes and fulfilling their tasks. This early integration of employees increases their motivation and helps overcome barriers to change. Third, people are required to *drive the change* and be responsible for change activities and mobilizing the entire organization. Fourth, *decisions* taken need to be scrutinized, especially when these decisions are based on experience. This helps to address the causes of problems and not their symptoms. Fifth, changes need *patience* and a clear direction in the form of energy, discipline and focus.

Najmaei (2011, p. 169p) identified the development of a *learning-oriented culture* as a challenging tasks for managers. A learning-oriented culture enables smooth reconfiguration of resources and should ensure timely recognition and action to establish a new value system. Establishing, controlling and strengthening relationships between value network partners and the securing of mutual benefits for the company and their partners are also important tasks for the management. This requires a deep understanding of the resources stock to identify gaps in the resources and capabilities required in the company. As already identified by Demil and Lecocq (2010), this should be achieved through continuous, internal and external environmental scanning of factors influencing value creation and value capture capacities.

As shown in this section, management and leadership are essential to BM changes. Besides the sensing and seizing of new opportunities, the important tasks of establishing a culture that appreciates change are highlighted once more.

Part III

Empirical Research

Chapter 6

Research Design

This chapter explains the detailed research design of the thesis. First, the overall research process is outlined and the theoretical considerations for the empirical research are explained. Afterwards, the empirical phase with data collection and data analysis is described and the quality criteria to ensure the reliability of the research are illustrated.

6.1 Overall Research Process

The reasons for choosing a qualitative research design were already elaborated in section 1.3. This exploratory, qualitative research is built on the research approaches proposed by Eisenhardt (1989, p. 533) and Gioia et al. (2012). The procedure described by Eisenhardt (1989) is a combination of the case study method according to Yin (2009) and the grounded theory approach according to Glaser and Strauss (1967). The method explained by Gioia et al. (2012) relies entirely on grounded theory, but tries to apply more rigor in this inductive approach. Additional reasons for choosing a combination of these two processes are (Eisenhardt, 1989, p. 532pp; Gioia et al., 2012, p. 1pp):

- Both research procedures are especially advantageous in new research topics.
- Both consider the existing literature prior to the study.
- Both approaches are established research procedures in their fields – Eisenhardt (1989) in strategic management and Gioia et al. (2012) in organizational science.

The two reference processes are considered in and integrated into every step of this research process. Their ideas are explained in more detail when describing the respective step in the process. Figure 32 presents the complete research process, which is divided into distinct phases.

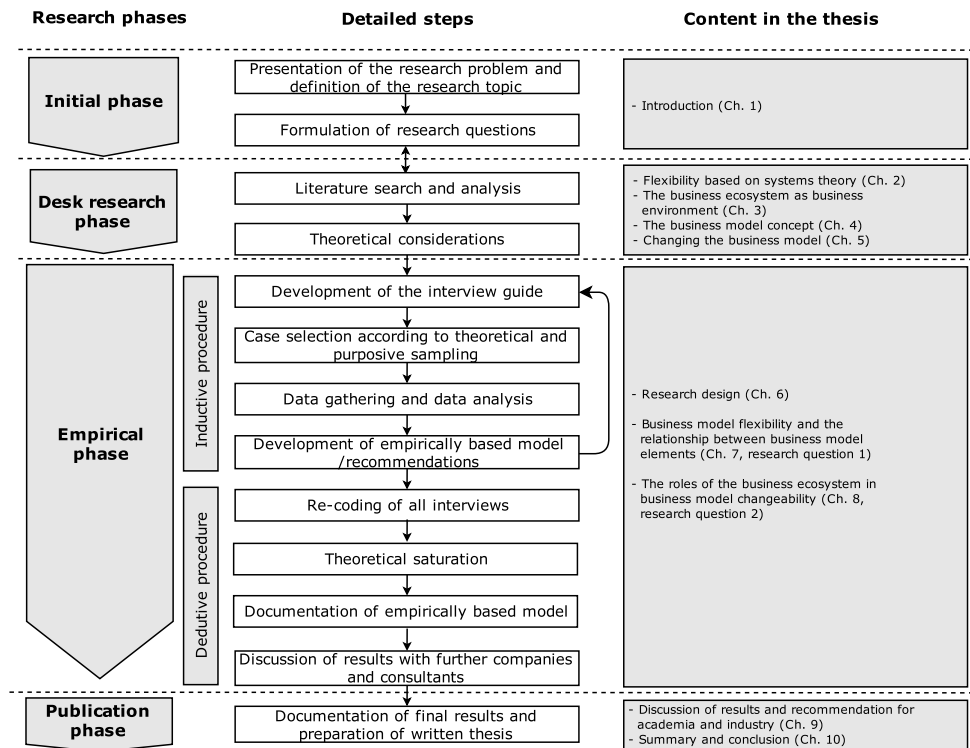


Figure 32: The research process of the thesis (own illustration)

The *initial phase* at the beginning had the goal of defining the research topic and formulating the research questions. During the *desk research phase*, the topics of *flexibility*, *business models* and *business model change* were introduced, as were *business ecosystems*. According to the information gathered in the desk research phase, theoretical aspects were considered and used to develop the interview guide as well as to strengthen theoretical sensitivity in the data analysis. The *empirical phase* is the main part of the research. It starts with the development of the interview guide and ends with an evaluation of the empirically based model. The entire research process concludes with the *publication phase*, which incorporates the final version of the written dissertation. The individual steps of the desk research phase and the empirical phase are explained in more detail in section 6.2 and section 6.3.

6.2 Desk Research and Theoretical Considerations

Previous theoretical knowledge has different meanings for qualitative and quantitative research because the two pursue different research goals. The goal of *quantitative research* is to test hypotheses; in order to develop hypotheses, it is essential to have rigor knowledge of the literature in advance. In comparison, *qualitative research* has the goal of identifying new

phenomena or explaining causal relationships or meanings (see section 1.3). For qualitative research, a researcher's previous knowledge is viewed with considerable skepticism, especially in the grounded theory. In relation to the in-depth literature study in a quantitative study, the knowledge on a specific topic is characterized by the researcher's personal experiences and attitudes as well as prior knowledge of the topic. This knowledge is mainly presented implicitly, but is essential in order to clarify the topic and ask appropriate questions. Legewie (2005, p. 7) explains that researchers can only ask intelligent questions and identify issues that are relevant to the research problem if they possess previous knowledge in the appropriate research field. This knowledge increases the *theoretical sensitivity*, which helps to identify details and meaning in the data. (Strauss and Corbin, 1998, p. 42pp; Muckel, 2007, p. 219; Birks and Mills, 2010, p. 58pp)

Despite the criticism of the literature study prior to qualitative research, there are several counter-proposals for not setting off *tabula rasa* into the field and on the importance of understanding the object of study (Flick, 2005, p. 73). Flick (2005, p. 73) explains that existing theories can be seen as *versions*; new versions of the theory are developed through further investigations. Eisenhardt (1989, p. 536) goes one step further and describes the development of a priori constructs before data gathering and analysis. Both Eisenhardt (1989, p. 536) and Flick (2005, p. 73p) understand the predetermined theoretical considerations and constructs as being available temporarily and which can be rejected or changed during the research process. Eisenhardt (1989, p. 536) states that these considerations and constructs should not be taken as given because predetermined theoretical perspectives as well as propositions may falsify or restrict results. Gioia et al. (2012, p. 12) also share this view. Rejecting these predetermined considerations during the research process leads to the development of new theories.

According to Birks and Mills (2010, p. 22pp), the theory can be used in different phases of the research process – to improve the theoretical sensitivity⁸⁸, during the data analysis, or as a source of theoretical codes. Also, Miles and Huberman (1994, S. 65) state that it can be helpful to develop a list of categories or codes before entering the field; this should make the assignment process easier. However, the list of codes should also only be valid temporarily and can be rejected or changed. Adhering strictly to the grounded theory research, a consideration of the literature prior to the inquiry is not allowed, but Strauss and Corbin (1998, p. 48pp) emphasize the advantages of doing so, especially during theoretical sampling and when interpreting the results.

As this research is based on the research process of Eisenhardt (1989) and Gioia et al. (2012), the decision was taken to gather some theoretical knowledge prior to entering the field. Thus, there were some preliminary theoretical considerations on development of the interview guide, choosing the cases, and providing theoretical sensitivity in the analysis of the interviews.

⁸⁸Birks and Mills (2010, p. 24) further describe that, besides improvement of the theoretical sensitivity, the researcher also gains an insight into the research methods used by other researchers in the same field.

However, as proposed by Eisenhardt (1989, p. 536) and by Gioia et al. (2012, p. 12), these theoretical considerations are not firmly established; they are either further detailed and enhanced or they are rejected. New theoretical insights should be integrated during the empirical phase for development of the empirically grounded model. The next sections provide insights into theoretical considerations applied in this research.

6.2.1 Research Question 1 – Preliminary Theoretical Considerations

For research question 1 (RQ 1), the business model concept (see chapter 4) and business model change concepts (see chapter 5) form the basis of the theoretical considerations on how to enable flexibility in the business model. As the research on business models and business model change is still ongoing, the research landscape presents itself as being diverse, but offers a good basis for the phenomenon of changing the business model. In order to answer RQ 1, the following concepts were considered in the research, as illustrated in figure 33:

- *Business model definition*: Through the review of several definitions of business models in section 4.1.2 and the elements defined, four elements were identified as being relevant in the literature to describe and understand a BM. In order to determine the core elements of the BM for companies operating in high-technology industries, information on the BM and the companies' understanding of a BM is gathered in the interviews. Additional information available on the website and the documents provided are used for plausibility checks.
- *Drivers of business model change*: The literature review in section 5.1 showed, that changes of the business model are triggered by several internal and external factors. These influencing factors depend on the market conditions and determine changes in the BM. As companies operating in high-technology branches are strongly influenced by the environment, these factors are important in identifying BM changes and the capabilities required for this purpose.
- *Change of business model (elements)*: As the literature review in section 5.3 revealed, the perception and description of changes to the business model and its elements are quite diverse. The concepts analyzed are closely interrelated, and only a few distinctions are discernible. As the focus of the thesis lies on changes to existing business models and revealing where flexibility is required in these business models, the characteristics of change concepts explaining more frequent change activities are of interest where changes can take place in several elements and in the BM as a whole. In order to proceed with a systemic view of the thesis, every business model element as well as the business model as a whole are considered as possible sources of change.

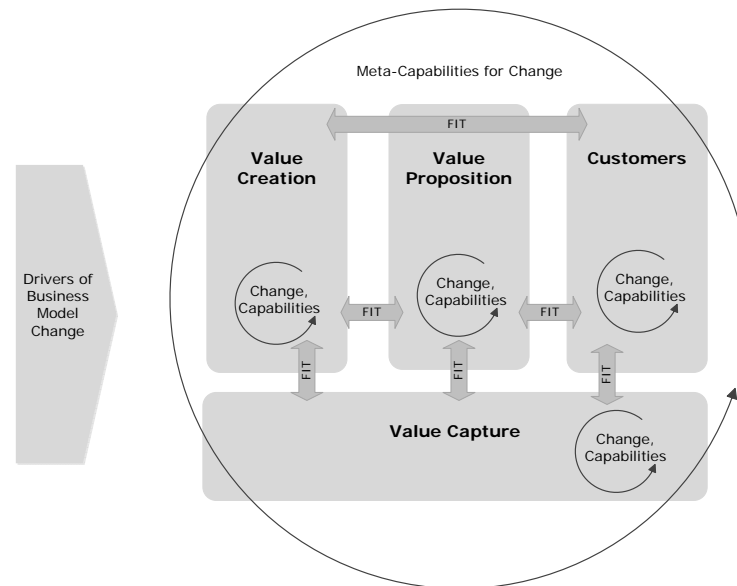


Figure 33: Enabling flexibility in the business model – theoretical considerations (own illustration)

- *Interrelationship between business model elements:* Section 4.2.5 highlights the importance of BM elements being interrelated and how they are aligned or a “fit” is present between them. This is a pre-condition for successful value creation. As a result of this interrelationship, changes in one element, triggered either internally or externally, can cause misalignment between elements. This misalignment can result in a need for other elements in the BM to be changed and then re-aligned again. Due to these changes, the entire BM changes as well to a certain degree. Thus, the consequences of such change events and establishment of the alignment between the elements are considered as well.
- *Capabilities for business model change:* As illustrated in section 5.4, different capabilities are needed to identify and implement a change in the business model. These capabilities are explained more generally, but the specific capabilities necessary in single elements are not described. Due to the definition of flexibility as an ability of the BM and its single elements to adapt to changes or exploit opportunities (see section 2.3), change capabilities of the business model as a whole, defined as *meta-capabilities*, as well as capabilities present in single elements should be examined in the context of this research.

To address the theoretical considerations in the interview, several pre-formulated questions are prepared in the interview guide and supplemented by questions that appeared in the context of the specific interview. Information available on the website and supplementary documents are used for plausibility checks. Table 18 shows which specific questions in the interview guideline address the theoretical considerations of RQ 1.

Concepts considered	Consideration in the research
Business model definition	Information available on the website; Questions 3, 4, 6; Appendix A.1
Drivers of business model change	Questions 2, 18, 25, 26; Appendix A.1
Change of business model (elements)	Questions 2, 5, 7, 8, 9, 10, 27, 28; Appendix A.1
Interrelationship between business model elements	Questions 9, 11; Appendix A.1
Capabilities for business model change	Questions 12-17; Appendix A.1

Table 18: Theoretical considerations in the interview guideline concerning RQ 1

6.2.2 Research Question 2 - Preliminary Theoretical Considerations

Research question 2 (RQ 2) has the goal of identifying the role of the business ecosystem in the changeability of the business model. Thus, an understanding of the business ecosystem (chapter 3) and business model change concepts (chapter 5) provides the basis for theoretical considerations. As section 5.1 showed, some research has already been conducted on internal and external factors that influence the BM and force a change. These factors also include partners in the BE, like customers or competitors. Thus, the literature on BEs provides a deeper insight into participants in the BE and into how they are connected and influence each other. In order to conduct research on the perceived role of the business ecosystem in business model changeability, the following concepts are considered (see also figure 34):

- *Business ecosystem of the company*: As shown in section 3.3, the business ecosystem consists of various participants who are interrelated and follow different strategies. The business ecosystem view sees the company as part of a community or network, where partners not only influence each other, but actually *co-evolve*, meaning that the partners influence and adapt to each other. In the literature on partners influencing the business model, it is mainly customers and competitors that are considered. This research broadens the current view by considering the entire BE in the context of high-technology companies.
- *Relationships with business ecosystem partners*: The extent to which partners influence each other depends on the individual relationships between the company and the partner. Section 3.3.2 describes various forms of relationships, ranging from very close, collaborative relationships to simple co-existence. Thus, as proposed by Wilkinson and Young (2002, p. 130), studying the characteristics of relationships and partners helps

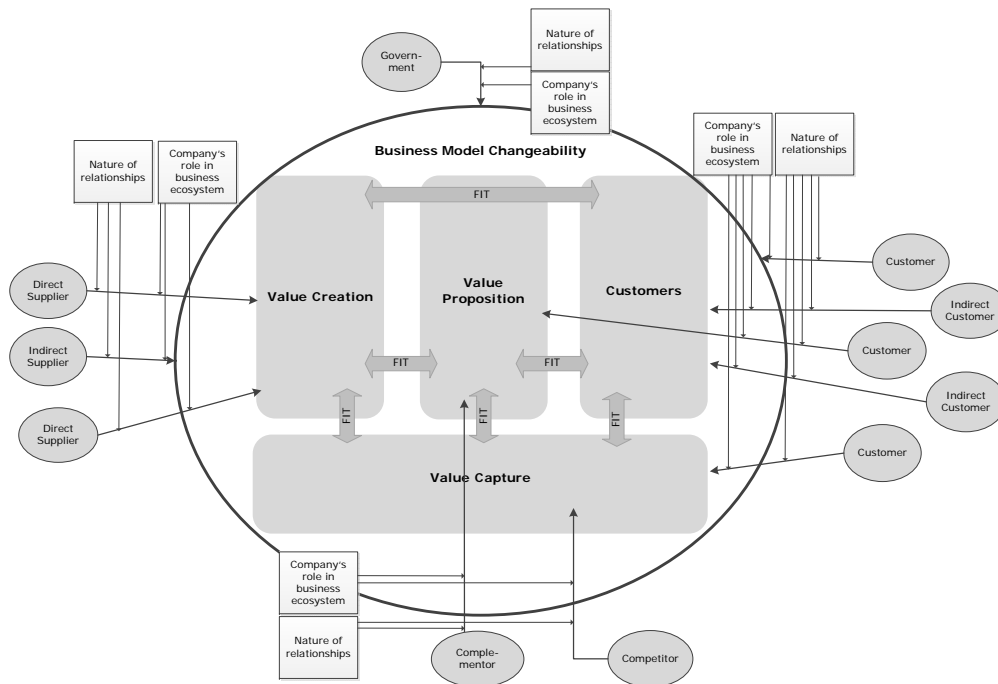


Figure 34: The role of the business ecosystem in business model changeability - theoretical considerations (own illustration)

to identify the impact of these partners on a company's behavior and, in this research, on the changeability of the BM. One criterion for considering a company in the research sample is the company's exposed importance of partners for their business, based on information available on the website.

- *Role of the company in the business ecosystem:* Anggraeni et al. (2007, p. 15) stated that not only the relationships between companies should be examined, but also the *roles* a company can play there. Subsection 3.3.1 additionally showed that the role of the company depends on the relationships it has as well as the power of the company itself in this network. Thus, it was assumed that the company's own role in the network also determines the importance of external partners when it comes to changes in the business model.

To address the theoretical considerations as in RQ 1, several pre-formulated questions are prepared in the interview guideline and complemented by questions that appeared in the context of the specific interview. Table 19 shows which specific questions in the interview guideline address the theoretical considerations on RQ 2.

Concepts considered	Consideration in the research
Business ecosystem of the company	Information available on the website; Questions 2, 18, 25, 26; Appendix A.1
Relationships to business ecosystem participants	Information available on the website; Questions 19-23; Appendix A.1
Role of the company in the business ecosystem	Information available on the website; Questions 2, 3, 23 and 24; Appendix A.1

Table 19: Theoretical considerations in the interview guideline concerning RQ 2

6.3 Empirical Study

The central elements of the empirical study are data gathering and data analysis to develop the empirically based model. Subsequently, these two steps are explained in detail.

6.3.1 Theoretical and Purposive Sampling for Choosing Company Cases

The procedures of *theoretical sampling* and *purposive sampling* are used to choose the company cases in this research. Theoretical sampling is an iterative process in which data gathering and data analysis alternate (Birks and Mills, 2010, p. 69p) and the sample is not determined in advance. There is no specification of the kind of materials needed for development of the theory, nor of when, where and how data is generated or collected. On the contrary, those cases providing the most insights or materials are added to the sample for further development. Theoretical sampling differs greatly from statistical sampling, where the sample is defined in advance. In theoretical sampling, there is no need to know the total population in advance, nor to determine the sample at the beginning, and sampling follows more of an iterative than a linear process. Memo writing can be helpful in choosing the next cases. Alternate data gathering and analysis continues until *theoretical saturation* is reached; adding more materials does not result in additional insights. (Strauss and Corbin, 1998, p. 202p; Flick, 2005, p. 102pp; Birks and Mills, 2010, p. 10p) With *purposive sampling*, the cases are chosen purposefully for the study. This means that there may be a deliberate selection of only extreme or deviant cases, but also only typical cases. Choosing the cases according to the *convenience* of gaining access easily to interview partners is also a form of purposive sampling. The criteria for choosing cases in purposive sampling are frequently the availability or the available time of the interviewee, but also the interviewee's knowledge on and experience of the particular topic in order to answer the questions in the interview. (Flick, 2005, p. 109p)

For this research, a mixture of theoretical and purposive sampling was chosen because some

criteria for choosing the cases were determined in advance. This complies with purposive sampling because these criteria help to identify cases that are best suited to researching the phenomenon. Pragmatic reasons like the accessibility of interview partners were also taken into consideration. In line with theoretical sampling, the cases actually researched are chosen in an iterative process of data gathering and analysis. The following criteria were defined in advance for selecting these cases:

- *Companies in high-technology (and medium-high technology) industries:* Companies in high-technology industries face a high speed of change and volatility. This requires constant adaptation to changing conditions. Furthermore, high-technology companies normally work closely with other companies in the value chain and thereby influence each other. (Chiou, 2011, p. 295) These are reasons why companies operating in high-technology industries are suitable for investigation in this research. Besides purely high-technology companies, a few medium-high technology companies are considered as well. The reasons for this are the sometimes blurred boundary between the classification of medium-high and high-technology⁸⁹ and the assumption that innovative medium-high technology companies face the same challenges as companies classified as purely high-tech. In order to select suitable companies, classification according to *NACE Rev. 2*⁹⁰ was used. A more detailed description of which industries are covered by this classification is provided in section 6.3.2.
- *Independently managed companies:* Single organizations, independent divisions or business units are considered in the study. This restriction results from the fact that business models have a hierarchic structure and differ between divisions and also business units.
- *Consideration of established, medium-sized and large companies:* Established companies have already developed and used their BM on the market and have to think about renewing the BM because of influencing internal or external threats or opportunities and to ensure value creation for their stakeholders and themselves in the future (Sosna et al., 2010, p. 384pp). In comparison, start-ups are companies that “*search for a repeatable and scalable business model*”, and in doing so, they “*change their business model multiple times*” (Blank, 2010). Thus, established companies are suitable cases for this research purpose. In addition, only medium-sized and large companies are considered⁹¹. The rationales for this are the fact that these companies have explicit and formally defined

⁸⁹For example, the NAICS (North American Industrial Classification System) has a much broader view and considers companies as high-technology that are labeled as medium-high technology by *NACE Rev. 2*. (Source: <http://www.nsf.gov/statistics/seind04/c8/state/data/8-25dt.pdf>, 2.10.2014)

⁹⁰*NACE* stands for *Nomenclature statistique des activités économiques dans la Communauté européenne* and describes a systematic way of classifying industry sectors in the European Community

⁹¹According to WKO, medium-size companies have >49 to 249 employees and large companies have employees upwards of 250. (Source: https://www.wko.at/Content.Node/Interessenvertretung/ZahlenDatenFakten/KMU_Definition.html, 2.10.2014)

structures, processes and strategies; and the same is seen as applying to the BM.

- *The headquarters and/or single divisions or business units have to be located in Austria:* This restriction has pragmatic reasons, such as access to interview partners and additional materials (e.g. annual reports).

Fulfillment of these criteria was verified in advance by checking the web site of the companies or talking to the interview partners; this was a precondition for consideration in the sample. The following sections describe how data gathering and data analysis were conducted.

6.3.2 Data Collection

Qualitative, empirical data can take different forms, for example interviews, observations or articles in the press. Especially the grounded theory emphasizes the integration of different data for theory generation. A common method of data gathering in qualitative research is through *semi-structured interviews*. (Gioia et al., 2012, p. 5) Semi-structured interviews are used if the interview partner incorporates complex knowledge on a specific topic. The interview guideline contains open as well as theory-driven questions, which are formulated according to the presuppositions of the researcher. This helps to identify the implicit knowledge of the interview partner. *Expert interviews* are a special form of semi-structured interviews, where the interview is conducted with experts (Gläser and Laudel, 2010, p. 12; Bogner et al., 2014, p. 4). Experts are people who command specific knowledge in their field because of their position, and expert interviews are seen as a suitable way of capturing the specific knowledge of these experts. The focus of expert interviews is the knowledge the expert can provide and not the actual expert as a person. (Flick, 2005, p. 127pp; Gläser and Laudel, 2010, p. 11p) Bogner et al. (2014, p. 23pp) describe different forms of expert interviews: *Explorative expert interviews* are used to gain first insights into the research field, very often prior to a quantitative study. The *systematizing expert interview* has the goal of gathering the broad knowledge of the expert on the research topic; the expert plays the role of advisor from whom the researcher can learn. In the *theory-generating expert interview*, both the implicit and the explicit knowledge of the expert are relevant. This form of expert interview is based on considerations of the grounded theory and the analysis process described there (Bogner and Menz, 2005, p. 38p). The expert is seen as the representative of a particular group; compared to the two other forms, the interview is conducted more openly, but with a certain structure in respect of the topic.

Experts are designated as persons having the following characteristics (Bogner and Menz, 2005, p. 40p; Meuser and Nagel, 2005, p. 73; Bähring et al., 2008, p. 92p):

- Implicit knowledge, specific information and competencies.

- Responsible for the design, implementation and controlling of a solution to a problem.
- Privileged access to information, e.g. decision processes or groups of people.

So far, there is no consensus on the definition of an expert; according to experience from other research studies, the designation as expert is the subjective perception of the researcher. In companies, experts are people having specialized knowledge of partial areas or of the entire company, normally combined with long-standing work experience, higher positions in the hierarchy and direct access to requirements or processes in the company. Mainly people in the top and middle management are designated as experts. (Bähring et al., 2008, p. 92p)

In order to choose an expert, the researcher should make the following preliminary considerations (Gläser and Laudel, 2010, p. 117):

- Who has the relevant information?
- Who is best suited and is willing to provide the information required?
- Which of the people eligible is available?

When choosing the experts and conducting the interviews, several difficulties may be encountered (Thomas, 1995, p. 9; Weiss, 1995, p. 131; Bogner and Menz, 2005, p. 54p; Gläser and Laudel, 2010, p. 117p):

- Access to interview partners with whom the researcher has no personal contact.
- The availability and willingness of a manager for an interview: There may be difficulties in garnering people higher up in the hierarchy as interview partners than people lower down the hierarchy.
- Time and regional restrictions of the interview requires flexibility by the interviewer.
- Perception of the interviewer as non-professional and, therefore, differences in status and age.
- Confidentiality and anonymity.

As stated in section 6.3.1, this research mainly investigates companies in high-technology industries classified according to *NACE Rev 2*. According to *NACE Rev. 2*, companies established in *group 21 – manufacturing of basic pharmaceutical products and pharmaceutical preparations*, *group 26 – manufacturing of computer, electronic and optical products*, as well as *group 30.3 – manufacturing of aircraft, spacecraft and related machinery* are designated as high-technology (see table 20). (EUROSTAT, 2014) In addition to companies which are defined by *NACE Rev. 2* as purely high-technology, companies in the medium-high technology classification were also included in the sample. Companies from this category were considered because, on the one hand, other classification schemes like the NAICS have a broader view of high-technology and, therefore, also categorize medium-high technology companies as purely

high-technology, and on the other hand, they also face the same challenges as purely high-technology companies. Thus, medium-high technology companies are considered if innovation is seen as an important issue in their business. This was obvious, for example, from the form of innovation activities presented on the website or innovation awards obtained.

Manufacturing industries	NACE Rev. 2 codes - 3-digit level
High-technology	<ul style="list-style-type: none"> - 21 Manufacture of basic pharmaceutical products and pharmaceutical preparations - 26 Manufacture of computer, electronic and optical products - 30.3 Manufacture of aircraft- and spacecraft-related machinery
Medium-high-technology	<ul style="list-style-type: none"> - 20 Manufacture of chemicals and chemical products - 25.4 Manufacture of weapons and ammunition - 27 to 29 Manufacture of electrical equipment, Manufacture of machinery and equipment n.e.c., Manufacture of motor vehicles, trailers and semi-trailers - 30 Manufacture of other transport equipment excluding 30.1 Building of ships and boats, and excluding 30.3 Manufacture of air- and spacecraft and related machinery - 32.5 Manufacture of medical and dental instruments and supplies

Table 20: High-technology classification of companies according to NACE Rev. 2 (EUROSTAT, 2014)

Table 21 shows the final list of 20 companies in the sample (Company A to Company T), as well as the two discussion partners (Company U and Company V), their ÖNACE⁹² classification as well as the location of the headquarters (HQ). A detailed consideration of the sample is provided in appendix A.3. From the sample of 20 companies, 13 companies can be clearly defined as high-technology and 6 companies are in the category of medium-high technology. One company, Company G, can neither be related to medium-high technology nor to purely high-technology. Nevertheless, the reasons for including this company in the sample are the high priority innovation and myriad of innovation activities taking place in the corporate group as well as in the company. Furthermore, the company operates in high-technology industries (e.g. aviation) and the author assumes that the dynamics present in these branches also influence the company. Thus, the company seemed appropriate for the sample.

⁹²ÖNACE is the Austrian designation of the classification, based on NACE Rev. 2.

Company	ÖNACE classification	HQ	Company	ÖNACE classification	HQ
Company A	26.110 (100%)	AUT	Company K	28.290 (40%)	AUT
Company B	29.310 (75%)	NE	Company L	26.510 (100%)	DE
Company C	26.110 (40%)	AUT	Company M	26.300 (75%) 26.510 (25%)	AUT
Company D	28.290 (50%)	AUT	Company N	20.140 (80%)	AUT
Company E	26.300 (27%) 26.541 (14%)	AUT	Company O	21.200 20.200 ⁹³	DE
Company F	26.110 (70%)	USA	Company P	26.510 (40%)	AUT
Company G	23.430 (50%) 23.990 (50%) ⁹⁴	AUT	Company Q	26.110 (80%)	AUT
Company H	21.200 (100%)	DE	Company R	28.120 (40%) 26.110 (30%)	AUT
Company I	26.700 (100%)	AUT	Company S	28.290 (80%)	DE
Company J	26.510 (100%)	AUT	Company T	28.999 (60%)	AUT
Company U	29.100 (50%) 28.290 (50%)	AUT	Company V	n.a.	DE

Table 21: Companies in the sample

HEROLD⁹⁵ was used to identify companies located in high-technology and medium-high-technology sectors, respectively. All ÖNACE classifications assigned to a company are visible in HEROLD. As companies operate in more than one business field, assignment to more than one ÖNACE code is possible. When the company has proven suitable, the experts potentially suitable for the interview have to be identified. For this research, persons are designated as experts if they are involved in the strategic development of the company because business model development and improvement and strategic business partners are part of their responsibilities. Thus, CEOs, business unit managers, but also people in business development are examples of the experts interviewed. The interview partners were identified through existing contacts that the researcher had to people in the company; in addition, social networks like XING⁹⁶ or LinkedIn⁹⁷ were used. In order to contact the interview partners, mainly e-mails or XING

⁹³The breakdown as a percentage was not available.

⁹⁴As already explained, the company does not belong to (medium-)high-technology, but the innovativeness of the corporate group and the company as well as the operation of the company in high-technology branches are reasons why Company G is included in the sample.

⁹⁵HEROLD provides services like yellow pages, telephone books or a B2B platform to find information on companies. The information is available for Austria.

⁹⁶XING is a social network for business contacts in the German speaking area; see <http://www.xing.com/de>

⁹⁷LinkedIn is also a social network for business, but unlike XING, LinkedIn is present in more than 200 countries; see <https://www.linkedin.com>

messages were sent out; in addition, clarifying telephone calls were conducted with some interview partners prior to the interview. In order to prepare for the interview and obtain an idea of the topics to be discussed, information on the study was sent out to the interview partners in advance (see appendix A.2). The interviews were conducted between July 3rd, 2013 and May 27th, 2014. All interviews were conducted face-to-face at the company site. The length of the interviews ranged from 00:27:27 to 01:34:06 as the actual interview time recorded; all conversations lasted longer and there were integrated parts that were not recorded. Only one person was interviewed at each company due to the difficulty of obtaining an appointment with appropriate interview partners. Issues concerning anonymity and confidentiality were clarified prior to the interview. As not all interviewees allowed disclosure of the company name, all interviews were treated anonymously. This anonymity was also agreed at the individual level. Thus, no direct or literal quotations from the interview data can be assigned to individual interviewees.

Besides the primary data gathered in the interviews, secondary data in the form of information on web sites, press releases or documents and reports available from the company were considered as well. These secondary data were used to gain additional insights into the companies. Also, two research projects in the form of a bachelor's degree project and a master's thesis supervised by the researcher were started in this research field. The results of these two projects were used to broaden the knowledge available in the field of interest and gain further insights. The additional information on companies and the knowledge gained from research projects are not treated and analyzed as primary data; instead, they are used for plausibility checks and interpretation of the results.

After generating the initial data in expert interviews and data analysis, a second round of data gathering began. This was not in the form of interviews; it was rather a *discussion* of empirical results. Discussions with these partners (Company U and Company V, see table 21) were already conducted prior to the empirical study in order to gather experience in the field of interest. Both discussion partners are experienced in high-technology or medium-high technology industries, with one discussion partner being a company with several people involved in discussions and the other being a consultant with just one person involved. The results of these discussions were used as confirmatory information to sharpen up the results and for the discussion in section 9. Detailed information on the experts involved in this round of data gathering are available in appendix A.3.

6.3.3 Data Analysis

In qualitative research, analysis of the data gathered is as important as the data gathering process itself. In analyzing qualitative data, different approaches are conceivable, and these approaches can also be combined. In general, the analysis of qualitative data is referred to

as *coding*. *Codes* label parts of the text with different levels of detail and different types of information (e.g. descriptive, interpreting). (Miles and Huberman, 1994, p. 56)

In analyzing the interview, a transcription is helpful, especially during the inductive analysis. As the focus of expert interviews is in the content of the interview in the form of *what* the expert explains and not *how* he/she explains it, nonverbal expressions like coughing, sighing or breaks between two words were not considered in the transcription. Methods for the qualitative data analysis should be chosen according to the respective research and questioning, where a combination of methods is also possible. It is important to take an open approach that suits the requirements of the research content. This is necessary in order to obtain a convincing interpretation and to ensure that plausible results are presented. (Bähring et al., 2008, p. 101pp)

Figure 35 provides an overview of various possibilities for qualitative data analysis. In the following sections, these methods are explained briefly, followed by a description of the data analysis for this research.

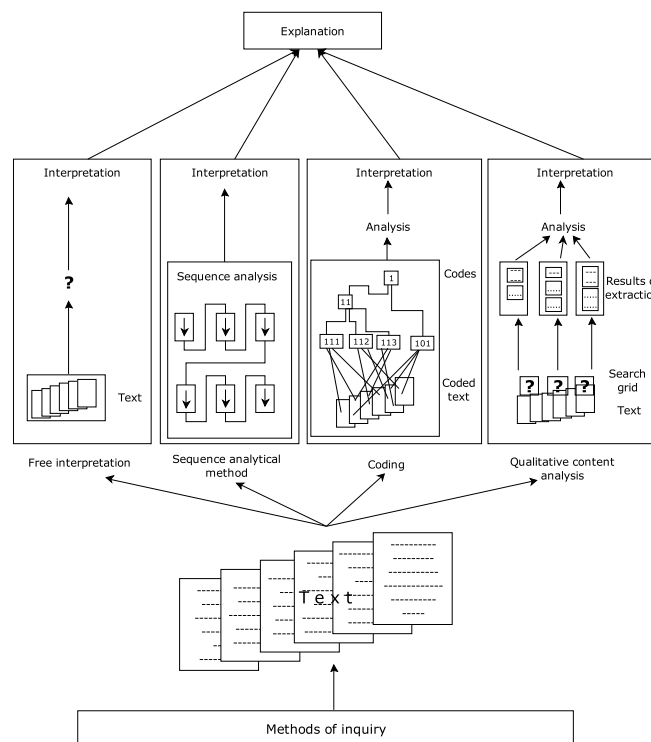


Figure 35: Classification of different methods of data analysis (referring to Gläser and Laudel, 2010, p. 44; translated by the author)

6.3.3.1 Methods of Qualitative Data Analysis

When using *free interpretation* as a method of qualitative data analysis, the researcher reads the interviews, interprets them and summarizes the main aspects to answer the research questions. Due to the lack of codes of practice, the process followed by the researcher can only be understood vaguely. Free interpretation is a very common method in research practice because it is possible to obtain results within a short time frame. (Gläser and Laudel, 2010, p. 45)

Methods of *sequential data analysis* are, for example, *narrative analysis* by Fritz Schütz and *objective hermeneutics* by Ulrich Oevermann. These methods analyze statements according to their temporal and thematic relations. A narrative analysis analyzes the arrangement as well as the relationships between text passages or types of text. Objective hermeneutics is a very sophisticated procedure, which is why it is rarely applied. In order to interpret the data, several independent interpretations are generated and checked according to their consensus with the text. This allows successive exclusion of all irrelevant interpretations. (Gläser and Laudel, 2010, p. 45)

A very common approach in data analysis is the coding procedure in *grounded theory*. This analysis approach marks all relevant text passages with codes; the ongoing analysis provides a hierarchical development of codes representing the structure of the text. (Gläser and Laudel, 2010, p. 45p) The grounded theory procedure comprises three steps – open coding, axial coding, and selective coding (Strauss and Corbin, 1998):

- *Open coding* starts the analysis process with the preliminary designation of codes. Thus, individual text passages are chosen and analyzed in detail. The text can be analyzed word by word, sentence by sentence or in complete text paragraphs. The text segments chosen are considered in detail, analyzed by asking different questions on the text, and underlying theories are labeled by codes. These codes can be natural codes available in the text (*in vivo codes*) or codes already developed in theory. (Mey and Mruck, 2009, p. 117pp) Memos can help to store the thoughts of the researcher during the analysis process. Preliminary categories⁹⁸ are developed from this and dimensions are established. In this way, properties are assigned to dimensions and different shapes of these properties are determined. (Muckel, 2007, p. 218) The result of open coding is a list of codes and preliminary categories as well as memos explaining the relationships between categories. (Mey and Mruck, 2009, p. 129) Gioia et al. (2012, p. 6) describe codes emerging from open coding as *1st-order concepts*, which can result in a huge amount of such concepts.
- *Axial coding* systematically refines and elaborates preliminary categories (Mey and Mruck,

⁹⁸Categories are a summary of the same codes (Muckel, 2007, p. 218).

2009, p. 129). Thus, different methods like the flip-flop-method⁹⁹, “swinging the red flag”¹⁰⁰ or the coding paradigm¹⁰¹ can be helpful (Strauss and Corbin, 1998, p. 94pp; Muckel, 2007, p. 223p). In the description by Gioia et al. (2012, p. 6), the result of axial coding are *2nd-order themes*, which should reduce the number of *1st-order concepts* by aggregating the same concepts to themes.

- In the final step – *selective coding* – the key or core concepts/categories are defined among the categories elaborated. In addition, associated sub-categories are defined and their relationships are determined. Gioia et al. (2012, p. 6) explain the result of this step as *aggregated dimensions*, which attempts to further aggregate and summarize *2nd-order themes*. In doing so, it is important to find the common thread in the story and identify gaps in the argumentation. In the end, a theoretical model should be formulated, which is underpinned by the analysis and relationships between sub-categories. (Mey and Mruck, 2009, p. 134pp)

Qualitative content analysis has the goal of systematically extracting information from the text. This is conducted with the aid of an analysis grid, which is used to examine the text for relevant information. The information extracted is assigned to a category of this analysis grid and further processed independently of the original text. (Gläser and Laudel, 2010, p. 46) The most familiar approach in qualitative content analysis is that of Mayring (2000; 2010). In his procedure, Mayring (2000, p. 3p) describes two possible methods of category development: the *inductive* and the *deductive* development of categories. In inductive category development, predefined categories or selection criteria are described in relation to the questions in the research study. These categories define which aspects of the data are considered. With these selection criteria, the data is processed step by step. A feedback loop reworks the categories, verifies their reliability and aggregates them to higher-order categories if necessary. An analysis regarding quantitative aspects (e.g. frequency) can also be conducted. According to Mayring (2010, p. 67p), summarization¹⁰² is an appropriate technique here. The goal of the deductive application of categories is the transfer of theoretically grounded aspects to the material. The core task is to define rules according to which a category is assigned to the appropriate text passages. A coding guide can be helpful in this step. (Mayring, 2000, p. 4p) According to Mayring (2010, p. 83), structured content analysis¹⁰³ is an example of a deductive assignment of categories.

The difference between qualitative content analysis and other methods, especially grounded

⁹⁹Questioning and inverting of central concepts (Muckel, 2007, p. 223p).

¹⁰⁰Review of text passages in order to identify signals (Muckel, 2007, p. 223p).

¹⁰¹Analysis of codes or categories regarding conditions, strategies/tactics, interactions and consequences (Muckel, 2007, p. 224).

¹⁰²Summarization uses the particular text passages and develops the category in step-by-step aggregation of information (Mayring, 2010, p. 67p).

¹⁰³In structured content analysis, previously defined criteria are used to analyze the data (Mayring, 2010, p. 65).

theory, is the *independent processing of information from the original text*. This is not the case in grounded theory and sequential analysis because the analysis is conducted with the information extracted from the original text. Gläser and Laudel (2010, p. 46p) advise only using this procedure if the text itself is not the object of investigation (e.g. if it is just a description of social aspects that is important). They state that qualitative content analysis is suitable for analysis of expert interviews. Furthermore, *categories are developed ex-ante* in a qualitative content analysis, which means that categories are not developed in the process of the analysis; they are defined prior to the analysis process. Muckel (2007, p. 214) explains this procedure more as an assignment of categories to the text and not as the development of categories and their characteristics. With the description of this summarization technique and inductive category development, Mayring (2010, p. 67) addresses the concern of only assigning categories to the text because, with these techniques, categories are developed inductively from extracted and paraphrased text passages. This can be compared to open coding of grounded theory, but with a more systematic description of the procedure (Mayring, 2010, p. 84).

6.3.3.2 Data Analysis Procedure in the Present Thesis

All 20 interviews conducted for this research were transcribed, with 12 interviews being transcribed in full and 8 interviews only in notes¹⁰⁴ (see appendix A.3). The *f4* software tool was used to transcribe the interviews. During the transcription, all interviews were labeled with time stamps in order to mark questions and answers of the interviewee and the interviewer. The data analysis was conducted using the MAXQDA 11 software tool. Although this is a very powerful tool with many capabilities, text coding, code management and memos were the main functions applied.

The data analysis procedure is a combination of the summarizing technique and the structuring qualitative content analysis described by Mayring (2010, p. 67pp), as well as the analysis explained by Gioia et al. (2012, p. 6p). The most useful steps for this research were extracted from these two methods, resulting in a process with the following overlapping phases:

- *Establishment of a provisional coding scheme*: The initial coding scheme is based on the theoretical considerations described in sections 6.2.1 and 6.2.2. These theoretical considerations increase the *theoretical sensitivity* and are supportive in category development. Establishment of the provisional coding scheme was the starting point for inductive coding of the data gathered. This step was extracted from the structuring qualitative data analysis and is normally used in deductive category development (Mayring, 2010, p. 83). Nevertheless, the codes used for data extraction were not described in detail and should only be used to structure the text. Maxwell (2005, p. 97) also explains such

¹⁰⁴Notes means that all information important in the analysis were transcribed and further explanations were provided in abbreviated form.

categories more as *themes* and less as categories, which should help to structure the topic. They are also not considered as being fixed, as is proposed by Eisenhardt (1989, p. 536).

- *Inductive coding of interviews:* All interviews were coded according to the provisional coding scheme established, which was used as a structuring scheme. The coding units chosen were single text paragraphs correlating to the codes defined in the structuring scheme. These text passages were transferred to the software tool Excel and paraphrased¹⁰⁵ as described in the summarization technique by Mayring (2010, p. 67p). In addition, the main aspects of the text passage were translated from German to English and further aggregated to form one main statement. These main statements are comparable to the *2nd-order themes*¹⁰⁶ described by Gioia et al. (2012, p. 6).
- *Development of a system of categories:* A system of categories was developed by aggregating the paraphrased statements to form dimensions. The analysis was conducted first of all for each individual company, followed by a cross-case analysis where the results of individual cases were compared and the central categories developed. The resulting system of categories are described by Gioia et al. (2012, p. 6) as *aggregated dimensions of 2nd-order themes*.
- *Iterative data gathering and analysis:* The two final steps are conducted in an iterative process, alternating between data gathering and data analysis. This was reiterated until *theoretical saturation* was reached.
- *Refinement of the system of categories and definitions:* In order to define and refine the categories as well as to establish a causal relationship between them, the original data was screened again with the system of categories emerging. This follows the idea of deductive and more confirmatory content analysis, as explained in the structuring content analysis by Mayring (2010, p. 67pp).

6.3.4 Quality Criteria

In qualitative research, quality criteria cannot be fulfilled explicitly by a rigor process or by calculations. This is the reason why the quality of the results in a qualitative study is very often criticized. In order to secure the required quality, a researcher needs to prove the quality of the research in the form of transparency and traceability of the whole process. The following

¹⁰⁵Mayring (2010, p. 70) explains that the main aspects of the text can be extracted by paraphrasing. Since many of the text passages are very long, this method was used to extract the main statements from the text.

¹⁰⁶*2nd-order themes* are theoretical concepts that can be further aggregated to dimensions. The process of developing *2nd-order themes* is comparable to the axial coding explained by Strauss and Corbin (1998). (Gioia et al., 2012, p. 6)

paragraphs explain the main quality criteria used in a qualitative study and outlines how these criteria are fulfilled in this research (Punch, 2005, p. 254p; Borchardt and Göthlich, 2006, p. 50; Bortz and Döring, 2006, p. 53; Brühl and Buch, 2006, p. 24pp; Yin, 2009, p. 40pp):

- The *construct validity* can be enhanced by using multiple sources and providing transparency by establishing a chain of evidence from research questions by means of data gathering, analysis, interpretation and conclusion. In addition, important constructs can be defined prior to the research, and both experts and interview partners can be included in validating reports. The primary model for data collection in this research was conducted in expert interviews with single informants. To enhance the construct validity, secondary data were used for plausibility checks. In the documentation, case vignettes as a condensed form of primary data as well as paraphrased and coded data provided in the appendix further improve the construct validity, providing transparency and traceability of the data analysis as well as discussion and interpretation.
- The *internal validity* refers to the “*internal logic and consistency of the research*” (Punch, 2005, p. 254). It represents the validity of causal relationships in findings and their reliability. The more plausible alternative explanations are, the weaker the internal validity is. To ensure internal validity, multiple cases should be used to explain categories and concepts until theoretical saturation is reached. This research provides evidence of a category or concept by using and referring to multiple cases in the description and explanation. For this purpose, figures and tables are used to provide evidence and to refer to multiple cases as primary data.
- *External validity* explains the *generalizability* of results beyond the cases investigated. As the samples become less representative, the external validity also shrinks. Quantitative studies achieve external validity by drawing a conclusion from the sample and applying it to the overall population. This is not possible in qualitative studies because of the small number of cases; external validity is seen, therefore, as a weak point in qualitative studies. Generalizability in qualitative studies refers to *transferring* results in the form of theoretical propositions and analytical generalizability. This research provides generalizability by delivering sufficient information on the investigated companies operating in high- technology industries, reinforced through discussions and interpretation of the results by the discussion partners described. Further, recommendations are made for academia and industry, an additional enhancement to the generalizability of results. Thus, transfer of the results to other companies operating in high-technology industries should be ensured.
- *Reliability* in qualitative research is also a controversial discussion point. Reliability should ensure that another researcher will obtain the same results by using the same procedure. This requires detailed documentation of every single step in the research

process in order to ensure traceability. To ensure reliability, every step of the research process is documented precisely, especially the data analysis and interpretation of results. Furthermore, the detailed analysis process of every research question is explained prior to presentation of the results. Additional enhancement of reliability should be ensured by paraphrased and coded data (see appendices A.4, A.5 and A.7), which are denoted with a time stamp labeling the exact point in the respective interview.

Chapter 7

Business Model Flexibility and the Relationship between Business Model Elements

The goal of this chapter is to present the empirical results in order to elaborate the empirically grounded model to respond to research question 1 and the sub-questions formulated (see section 1.2). The empirical results are presented, therefore, with the help of paraphrased evidence from the interviews and case vignettes. The summary and discussion of the results in order to answer RQ1 are provided in chapter 9.1. The overall goal is to describe a business model that provides the flexibility to adapt to changing needs. Thus, the core BM elements, characteristics providing flexibility as well as interrelationships between elements when changing, are elaborated.

Based on theoretical considerations for RQ 1 illustrated in section 6.2.1, specific questions were formulated in the interview guideline (see appendix A.1) and supplemented by sub-questions emerging during the interview. In order to provide evidence on the development of the empirically grounded model, figure 36 points out the main steps in conducting the analysis. In order to analyze the data, pre-formulated codes were used to extract the information according to specific topics like the BM of the company, activities undertaken to change the BM, factors initiating a change of the BM as well as capabilities, competencies or activities undertaken to prepare the company for BM changes. Data extraction and detailed analysis were first conducted for every single company and interview. Afterwards, emerging patterns were aggregated and described for the whole sample. In order to develop the empirically grounded model, the explanations of the interviewees on the business models were examined in a first step to identify the BM elements forming the core. Afterwards, factors and incidents triggering a change in the BM and single BM elements were analyzed to elaborate patterns of flexibility needs. Based on this, changes in single BM elements due to flexibility needs and their

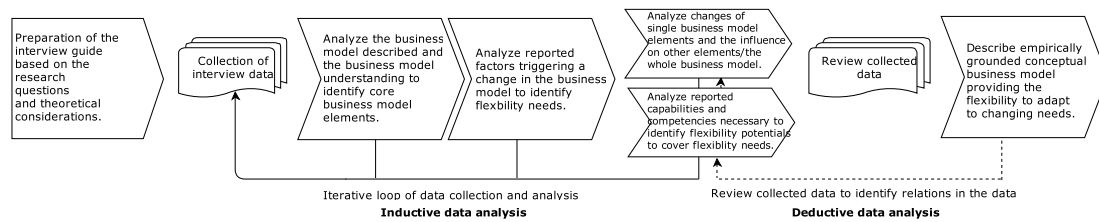


Figure 36: Procedure in RQ 1 analysis (own illustration)

influence on other elements in the BM were analyzed to identify paths of change activities and reveal the degree of BM change. Parallel to this, reported capabilities, competencies and activities taken to prepare the BM for change are analyzed to describe necessary flexibility potentials to cover flexibility needs. These two analysis steps were conducted in parallel because information on factors and incidents triggering BM changes, activities undertaken as well as capabilities necessary for this purpose are often reported jointly. All steps up to this point were inductive and exploratory; data collection and data gathering were performed in an iterative loop. The following steps are more deductive and confirmatory because the original data were screened with the emerging categories developed in the final steps. By scanning the original data, existing relationships between categories were examined and new ones developed. The result of these steps was an empirically grounded, conceptual business model providing the flexibility to adapt to changing needs.

In section 7.1, the core BM elements identified are explained in detail. Section 7.2 describes flexibility needs requiring a change in the business model, and section 7.3 describes which elements are influenced by flexibility needs and have to change. The necessary flexibility potentials to cover flexibility needs are explained in section 7.4.

7.1 Core Elements of the Business Model

This section describes the BM elements identified as core elements for the companies. In order to identify the core BM elements, each interview partner was asked to describe the business model of the company. In addition, the interviewees were asked to explain from their perspective the BM elements necessary to understand a business model. The explanations varied in their level of detail, thus an attempt was made in section 4.1.2 to classify the information on an appropriate level, based on the business model descriptions in the literature. It was observed from the interviews that there is widespread knowledge on the business model canvas by Osterwalder and Pigneur (2010), an established concept in literature and practice. The business models described by the interviewees were not as detailed as described, for example, in the business model canvas. The core business model elements identified are

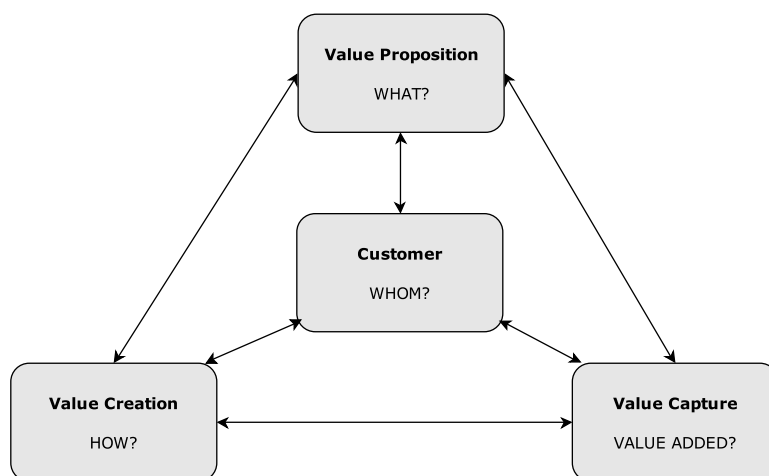


Figure 37: Business model elements identified as the core (own illustration)

illustrated in figure 37. These four BM elements correspond to the elements identified in the literature (see section 4.2): The *customer* element represents to whom and through which channels the value proposition is delivered; the *value proposition* outlines the value offered to the customer; the *value creation* explains which resources and processes are necessary to create the value proposition; and the *value capture* defines the revenue stream to the customer on the one hand as well as the costs involved in creating the value proposition on the other hand.

Table 22 shows the different companies and the reported core elements of their business model. A check was inserted in the list if the company reported on elements in their BM explanations; otherwise a dot was inserted. Appendix A.4 provides evidence on the checks in the table in the form of paraphrased explanations of core BM elements reported.

Company	Overall Business	Customer	Value Proposition	Value Creation	Value Capture
Company A	Product business	✓	✓	✓	✓
Company B	Product and project business	✓	✓	✓	✓
Company C	Product and project business	✓	✓	✓	.
Company D	Project business	✓	✓	✓	✓
Company E	Product, project, and service business	✓	✓	✓	✓
Company F	Product business	✓	✓	✓	✓
Company G	Product business	✓	✓	.	✓
Company H	Service provider	✓	✓	✓	✓
Company I	Service provider	✓	✓	✓	✓
Company J	Product business	✓	✓	✓	✓
Company K	Project business	✓	✓	✓	.

Company	Overall Business	Customer	Value Proposition	Value Creation	Value Capture
Company L	Product business	✓	✓	✓	✓
Company M	Product and project business	✓	✓	✓	✓
Company N	Product business and service provider	✓	✓	✓	.
Company O	Product business	✓	✓	✓	.
Company P	Project business	✓	✓	✓	✓
Company Q	Service provider	✓	✓	✓	✓
Company R	Product and project business	✓	✓	✓	✓
Company S	Product and project business	✓	✓	.	✓
Company T	Project business	.	✓	✓	.

Table 22: Core business model elements identified in the interviews

When asked about the business models of their companies, the interview partners usually started with an explanation of *what* they offer their customers in the form of products and/or services (the value proposition), the branch in which they operate, and who their customers are. What was observed from the explanations was the distinction made in the description of the business model, depending on whether the company is in the *project business*, *product business*, or operates as a *service provider* (see table 22). However, there are also companies that are not limited only to project or product business, but operate more in a combination of the two. Although the business model elements identified are present in all business models, the general perception and the goal of the business model differs. In project business, the business model depends on the accomplishments of the company in projects, which may differ from one project to another. *Company D* operates in the project business; they explained that they are not able to speak about *the* business model; instead, there are variations of the business model depending on the basic conditions of the project (see case vignette 1). In comparison, when the company offers a specific product, they are able to describe their business models in great detail, as shown in case vignette 2 by the product business model of *Company O*. The third business type identified is the service provider, where the company works as a contract manufacturer, mainly without offering its own product(s). Instead, the company has a specific *competence* that is provided to their customers in the form of accomplishments offered. Case vignette 3 explains the business model of *Company I* working as a service provider.

Company D is part of an international technology corporation and provides intelligent transportation systems with toll collection systems as their core business. Within the past few years, they changed their business from operating purely as a technology provider to appearing as a commercial operator. As a commercial operator, Company D incorporates more steps in the value chain and, therefore,

also more risks because the company is now responsible for financing issues and has to attend to the end customer, the call center, and so on. The main focus is not the technology anymore; instead the entire implementation and operation are incorporated. Company D explained that they have more than one business model because of the different roles they can take in projects. These roles depend on the specific situation and requirements of the project, like the traffic authority or the geographical conditions of the country. If a call for tenders for the implementation of a toll system is published, Company D has different possible ways of participating: Handing over a bid, offering know-how or providing concepts. Furthermore, the company can also operate as a system supplier or supplier of components, but also as a technical and commercial operator; the company can be part of a consortium or can lead a consortium. Also the revenue stream depends on the specific situation in the project, varying between a fixed or a variable rate. Thus, it is not possible to define one business model for Company D because the BM is determined by the project conditions and how the company operates there. Company D sees knowledge on the important steps of the general business process for constructing a toll collections system as well as knowledge of the success components in the project as core information in the BM. Furthermore, critical paths or milestones, interfaces to internal and external stakeholders and a reduction of complexity in the business process are also reported as essential for the BM.

Case vignette 1: Company D: Business model in the project business

Company O is located in Graz and is a subsidiary of an international health care group with headquarters in Germany. The core business of Company O includes the development, manufacturing and sales of pharmaceutical and medical products for critically ill patients. Their main customers are doctors and pharmacists in hospitals and critically ill patients in the home care sector. Critically ill patients in the home care sector are patients who no longer receive therapy in hospital; however this therapy is continued at home. Company O provides the medical products for this as well as liquid food if the patient is not able to feed him- or herself. The purpose of the company in the form of *what does the company do and why is the company doing it* are considered by Company O as essential for the BM. The information provided should include the *value proposition* (which products or values are offered), for *whom* it is offered and *how* value creation is accomplished (e.g. development, manufacturing, logistics).

Case vignette 2: Company O: Business model in the product business

Company I operates as a service provider and acts as a development and production partner for their customers in the two main markets – medical and optical technologies. In the medical technology market, the company serves the therapy, diagnostics, prosthetics and dental technology segments. In the optical technology market, the segments encompassed are laboratory technology, laser technology, the semiconductor industry, photovoltaics, and security technology. Company I

does not offer its own products, but instead manufactures products for their customers that are sold under the customers' own brand. Before manufacturing, the products are developed together with the customer, but revenues are only generated from manufacturing. The services offered by Company I are development and manufacturing, spanning the stages from the idea to the finished product. The development services act as "door openers" for manufacturing contracts. Company I reported that the *competencies* available and *concrete offerings* for the customer because of these competencies are important information for the BM. Besides this, it is important to know whether there is a market available for the competencies offered where these competencies are needed because no value can be captured if the customer is not willing to pay for the offering.

Case vignette 3: Company I: Business model of a service provider

	Company D	Company O	Company I
Overall Business	Project business; provider of intelligent transportation systems	Products for the critically ill	Service provider in the medical and optical technology markets
Customer	Project-dependent; buying-center; on the level of a state, 300-500 parties involved	Doctors and pharmacists in hospitals and critically ill patients in the home care sector	<ul style="list-style-type: none"> - Medical technology market: Therapy, diagnostics, prosthetics, and dental technology - Optical technology: laboratory technology, laser technology, semi-conductor industry, photovoltaics, security technology
Value Proposition	Know-how provider, system supplier or supplier of components; core business is toll collection systems	Pharmaceutical and medical products for the critically ill	Services span stages from the idea to the finished product
Value Creation	Depends on the respective business model and steps taken in the value chain	Development, manufacturing and sales of pharmaceutical and medical products	Development and manufacturing of products
Value Capture	Project-dependent; fixed or variable rate	Sale of products; no specific information in the interview	Manufacturing of products

Table 23: Summary of business model explanations in case vignettes 1-3

Table 23 provides an overview of the three types of business and business models described. The three case vignettes describe typical cases for these businesses, but combinations also exist, as is shown in table 22. This is the case because companies operate in different markets with different customers and customer requirements (e.g. Company C) or because the company adds a new business segment (e.g. Company N).

Comparing the three business models in terms of the core BM elements identified, differences were detected in their implementation. The *value proposition* in project business covers the realization of specific facilities or systems with unique characteristics of single projects. In comparison, the value proposition in product business encompasses products offered to the customer, usually complemented by additional services. These products may also provide

unique features for single customers or they are standard products provided to all customers. The value proposition of a service provider depends on the services offered to the customer, in this research context mainly in the form of development and manufacturing services. The *value creation* also differs between these three business models. In project business, the value creation steps very often depend on the specific situation of the project (e.g. Company D, Company T), whereas when offering a product, the steps of creating the value are clearly defined. In this research context, value creation of a service provider mainly encompasses manufacturing services, but companies increasingly offer development or additional advisory services because they see these additional services as future potential sources of revenue. *Value capture* in project business depends on the situation of the project and on the accomplishments of the company in the project. In product business, companies generate revenue through product sales, while the service provider captures most of the value by manufacturing products.

The classification of these three business types and their distinctions in the understanding of the business model provides only a rough differentiation. Further investigations are necessary to highlight the characteristics of these business models in the context of high-technology companies. For RQ 1, the core BM elements were identified in all three types of business models; only the characteristics of the elements implemented are different. As these classifications were not the goal of RQ 1.1, they are not examined in more detail. The remaining sections explain the four core business model elements revealed in more detail.

The Customer Element

For most of the companies interviewed, the *customer* is the focus of the business model and of all business activities in the company. The customer element defines to *whom* the value is delivered. The companies investigated generally serve customers in different branches, which is also visible in the business model. This can be in the form of an additional customer segment in the business model or of a separate business unit and, therefore, a different business model (e.g. Company C). For example, Company L reports that the business model starts with consideration of the customer; the orientation of the company should be *from the outside in*. Several companies interviewed designated the customer as the element in focus; thus, the element is at the center of the business model, as presented in 37. The importance of the customer for the companies was explained by the *close customer contact* in order to identify customer problems and needs. They explain the reason for this by explaining that added value can only be generated if the customer is willing to pay for this value. In addition to the customer himself, the *interface* to the customer in the form of distribution channels or key-account management is also reported as being necessary in building a long-term relationship (see Company A or Company L). Case vignette 4 describes the understandings and the importance of the customer element from the perspectives of Company A, Company H and Company L.

The business model of *Company A* addresses *three customers*: Investors, employees and the current customers of the company. This view results from use of the business excellence model of Philips, which does not consider the (end) customer alone^a. *Company A* justifies consideration of these three customers because value is not only created for customers, but also for the company itself. Although *Company A* considers these three customers, the current customers and end customers were the main focus of the BM discussion. As a result, only this customer group is considered further. *Company A* connects to these customers through two channels – direct customer sales and distribution. For direct customer sales, key account management was established with sales and technical support located in every relevant country in the world. Distributors integrate products of *Company A* into their portfolio to serve smaller customers. They are treated in the same way as the company's large customers. Furthermore, there are some special distributors operating in individual countries and markets. *Company H* serves two categories of customers: corporate and third-party customers, where the corporate group constitutes the primary customer segment with a proportion of 70%. Business with third-party customers was established to make full use of capacities, develop a second key pillar and strengthen the company's own position. For third-party customers, *Company H* started working as a solution provider in small-volume businesses. *Company H* pursued the goal of developing from being a manufacturer only to become a solution provider for the corporate group as well. Understanding the customer and hearing the voice of the customer are very important for *Company H* – *what* does the customer actually want and what is he/she *willing to pay*. *Company L* has two business models serving two different target groups. One BM provides tools for the R&D engineer; these customers build prototypes and use the measurement tools of *Company L* to verify and test the new prototypes developed. Customers of the second business model, the monitoring and surveillance of power electronics and power supply, are grid operators like E-Control, which has to monitor their grids. For *Company L*, the customer is clearly the focus of the business model; the entire company and business model concentrate on customer needs. Furthermore, knowledge of the sales channels used and how to establish and maintain customer relationships over time is important.

^aPhilips uses the EFQM model as a basis to manage the business and processes. This model pays equal attention to all stakeholders, not only customers. Source: <http://www.philips.com/about/company/businesses/businessesexcellence.page>, 18.08.2014

Case vignette 4: Companies A, H and L: Explanation of the customer element

As shown in case vignette 4, all three companies highlight the customer as the focus of activities driving the BM within the company. Although *Company A* sees investors and employees as customers, the general perception of the customer in the BM is in the form of a buyer or recipient of the company's offerings, who is willing to pay for these offerings. In addition to knowledge of the customers served, the interface in the form of the distribution or sales channel must be clear in order to strengthen the customer's position. As *Company L* showed, the customer element may also delineate different business models in the company.

The Value Proposition Element

The *value proposition* explains *what* the company is offering in terms of which *value* the company provides to their customers. The value proposition was first reported when asking companies to explain their BM. This also becomes evident in table 22 because each company reported on their value proposition. The value proposition of companies operating in project business encompasses realization of the project, which differs depending on the general conditions of the project (see case vignette 1 of Company D and case vignette 5). Products and also additional services offered by the company build the value proposition of companies operating in product business (see case vignette 2). Companies working as service providers capitalize on their specific competencies, which are offered in the form of engineering or manufacturing services. Despite the different characteristics of these businesses, the focus of the value proposition is the value offered to customers to fulfill their needs. Case vignette 5 provides an insight into the explanations of value propositions reported by companies A, H and L.

In the discussion of the business model with *Company A*, they designate themselves as hardware manufacturers. The core of their business model is the development of analog semiconductors, especially the development of micro-chips. Additional accomplishments include the manufacture of semiconductor wafers, testing and packaging. *Company H* is part of a corporate group with headquarters in Germany. The value provided for Company H is determined by the corporate group: working as an extended workbench for the corporate group to manufacture pharmaceutical and dietary supplement products. They have to complete forecast tasks on time to ensure that the market is supplied with the pharmaceutical products. Besides this, Company H established business with third-party customers to utilize unused capacities, establish a second key pillar and strengthen the company's own position. In this business, Company H positions itself as a solution provider, offering such tasks as documentation or product submissions in different countries in addition to manufacturing. Company H operates in a niche because of the specific technology acquired (e.g. a three-layer tablet can be produced by integrating three different ingredients) or by offering machines and processes for low-volume production. Customers value the fact that Company H is able to provide complete delivery on time and at reasonable cost. *Company L* operates two different business models: The largest BM with which the company achieved sustainable growth provides flexible measurement tools for the R&D engineer to verify and test prototypes; the second BM deals with monitoring and surveillance of power electronics and power supply. The business models are separated into two business units. Company L does not designate the first BM as a separate BM, but rather as the *core model* of the organization. The business model canvas is used by Company L to structure the BM. For this company, the value proposition that explains which value is provided to the customer is the second most important element after the definition of the customer.

Case vignette 5: Companies A, H and L: Explanation of the value proposition element

The value proposition described by the three companies in case vignette 5 includes products and services offered by the company to fulfill the customer's needs. However, additional values (e.g. delivery on time, reasonable costs) are important as well in fulfilling customer needs, as emphasized by Company H. Thus, the value proposition is determined not only by the products and services offered, but also through additional values that are important for the customer.

The Value Creation Element

The *value creation* element explains *how* the value is created for the customer. The companies interviewed stated that it is important to know where to position itself in the value chain and which processes and tasks are needed for value creation. For example, Company H mainly works as an extended workbench for the corporate group, but is also forced to work as solution provider for third-party customers by providing additional services. The companies in this research study see the business processes as central issues of value creation, but also the question of which resources and competencies have to be developed internally or procured externally in order to create the value. Case vignette 6 provides insights into the understandings of value creation in companies A, H and L.

Value creation at *Company A* starts with the procurement of raw materials, followed by the development, manufacturing and delivery of chips. *Company A* defined a business development process as a core process, consisting of the marketing and sales strategy process, product development and introduction process, as well as fulfillment. Value creation in *Company H* is realized through the manufacturing of products for the corporate group. For third-party customers, the company acts as a service provider by providing additional services like documentation or submissions in different countries. It is important for *Company H* to give customers the feeling that they are in good hands, from the beginning of the cooperation until the end of the project. *Company H* further stated that they pursue the goal of working as a service provider for the corporate group as well in order to strengthen the services provided and the tasks for all customers. One of *Company H*'s strengths in value creation is the good balance between cost optimization and flexibility; but this also constitutes a challenge, *Company H* reports. In order to describe the BM, *Company H* needs to know about positioning in the value chain and all activities the company performs. *Company L* reported that such tasks as software and hardware development were mainly executed externally by partners in the past, and the conception, the entire architecture and also controlling of the development were handled internally. However, this is currently changing because of company growth and the fact that a supplier has developed towards becoming a competitor. *Company L* further stated that it is essential to have a knowledge of how value creation takes place in terms

of the required partners and key factors needed, such as manufacturing, know-how or technologies, in order to understand the business model.

Case vignette 6: Companies A, H and L: Explanation of the value creation element

In summary, value creation consists of resources and competencies, processes and partners necessary to realize the value proposition for the customer. Thus, as explained by the examples in case vignette 6, companies define the required processes for this purpose. Within these processes, they decide which activities they will perform themselves and which are outsourced to external partners (e.g. Company L). Furthermore, information on the competencies needed for value creation has to be clear and determine whether specific tasks are conducted internally or outsourced.

The Value Capture Element

Companies consider the financial value generated for the company, the *added value*, as an important BM element. However, this value capture is not explicitly reported in many cases when talking about the BM, as table 22 shows. Some companies reported on the *revenue model* as an important element in the business model, but *costs and prices* were also named. Thus, revenue streams, cost structures and price mechanisms are included in the value capture element. Company A, for example, sees the margin from the products sold as the value captured from the price obtained for the product and the costs of generating the product. Although the value captured is not explicitly reported in many cases as an important element of the business model, its existence as a core element is beyond question because it describes how the company earns its money. Case vignette 7 provides some insights into the value capture of companies A, H and L.

The products and margins generated from product sales are seen as the central value capture of *Company A*. In addition, decisions on the price that can be achieved with the product and product features and thus, the costs incurred, are also seen as part of the element. For *Company H*, value creation differs between the corporate group and third-party customers. There are clear guidelines between the company and the corporate group on the profit that can be generated. With third-party customers, margins vary because customers are price-sensitive by demanding a high quality. Thus, the value captured depends on the specific customer. Company H asserts that they do not have the cheapest cost structure, but offer a reasonable price. The arguments for this are the flexibility provided in low-volume production. This strength is the reason why the company usually wins the bid, also in inter-company calls for tenders. This is different in the dietary supplements business because costs are the main factor there. The consequence is

that inter-company calls for tenders are also outsourced. Costs and prices are seen as important elements of the BM for *Company L*. How the value capture is structured in the company was not reported during the interview.

Case vignette 7: Companies A, H and L: Explanation of the value capture element

The value capture element describes the revenue streams in terms of prices that can be achieved by selling the value proposition. In addition, the costs for value creation also have to be considered in the element. Value capture is an essential element of the BM, although companies apparently do not actively report on it during BM discussions.

Table 24 summarizes the BM elements of companies A, H and L that are described in detail in Case Vignettes 5 to 7. The overview provided compares the entire BM of the companies described.

	Company A	Company H	Company L
Overall Business	Project business	Service provider	Product business
Customer	Investors, employees and customers; connection to customers through direct customer sales and distribution	Corporate group; third-party customers	Main focus of the BM; R&D engineers and grid operators
Value Proposition	Development of analog semi-conductors	Extended workbench for the corporate group; solution provider for third-party customers; production of pharmaceutical and dietary products in low volumes, flexibly, on time and at reasonable costs	One BM deals with measurement tools for R&D engineers; the second BM provides monitoring and surveillance of power electronics and power supply
Value Creation	Procurement of raw materials, followed by the development, production and delivery of chips; business development process as core process	Manufacturer for corporate group and solution provider for third-party customers; activities and position in the value chain need to be clarified	Value creation for business model important; required partners and key factors like manufacturing, know-how or technologies have to be known. Tasks like conception, the entire architecture, and controlling of the development are handled internally; software and hardware development are provided externally
Value Capture	Products and margins generated therefrom; price achieved and costs incurred	Fixed guideline on profit within corporate group; price and quality sensitivity by third-party customers, resulting in variations in margins	Costs and prices of products are important to know; no clear statement on value capture in the interview

Table 24: Summary of business model explanations in case vignettes 4-7

Alignment between Business Model Elements

As described in section 4.2.5, it is not only the definition of BM elements that is important, but also their interrelation and *alignment*. Thus, the BM elements identified should not be treated as stand-alone elements; rather, they are connected and influence each other, as explained in the systems theory. This connection and influence was also reported implicitly by the interviewees. For example, when talking about the customer focus, alignment of the entire company according to this focus is emphasized, describing implicitly the alignment of all BM elements towards customer needs and, therefore, the customer element (e.g. Company L in case vignette 4). The fit between the customer and the value capture is explained by Company H, for example, by highlighting the importance of the *willingness of the customer to pay* for the value provided. A very central issue is fulfillment of customer requirements, representing the connection between the customer element and the value proposition. The value creation describes the realization of value proposition, indicating the required alignment between value creation and value proposition. Creation of the customer value incurs costs, describing the alignment between value creation and value capture. The profit results from the revenues generated by the price for the value proposition minus the costs of value creation, to put it in a very simplified way. As the value creation determines processes like manufacturing or service provision to fulfill customer needs, there also has to be alignment between value creation and the customer's needs. This alignment between the elements is illustrated by the connections between the elements charted in figure 37.

7.2 Flexibility Needs as Reasons for Business Model Changes

According to the flexibility definition for this thesis in section 2.3, flexibility is determined by *needs for flexibility* and the *potentials for flexibility* necessary to cover flexibility needs. Flexibility needs are determined by external and internal factors and require a change in the BM. Figure 2 in section 2.3 describes these internal and external driving factors as *flexibility signals* determining flexibility needs. Needs for flexibility in this research study are identified in single driving factors (e.g. market trends, internal growth activities), incidents or signals reported leading to a change in the BM and are driven either internally or externally. For better comprehension, the driving factors and incidents reported internally and externally are further sub-divided. As the focus of the thesis is more on externally induced changes, these are considered in more detail, but internally induced changes are not completely excluded. The goal of this section is first to identify internal and external factors influencing the BM and hence define the flexibility needs.

7.2.1 External Driving Factors

External driving factors are trends and changes in the market (e.g. technological developments, crisis), customer requirements or decisions and regulations introduced by political and legal authorities. These are defined in more detail below.

7.2.1.1 Market Trends and Issues

High-technology branches are characterized by fast-moving technological developments, short product life cycles or changing customer needs. Thus, trends signaling a change need to be anticipated early on in order to verify whether the company needs to undertake any change activities. The trends and issues reported in the interviews incorporate *general changes in the industry* that the companies face, *technological trends*, *competitors* or situations of *crisis*. If such factors are anticipated at an early stage, the companies have the opportunity to develop a strategy, take the necessary steps and make the necessary changes in advance. For example, Company A reported that the semiconductor industry in Japan faced consolidation because companies were drifting towards China and Korea, which changed the market in Japan as the supply could not be guaranteed anymore. This offered business opportunities for Company A in Japan. Another example was provided by Company R, explaining that technological trends like the “Internet of the things” create opportunities for their products. If this proved interesting, it might create additional revenues for the company. Competitors and customers exert the main influence on the BM of Company C. For example, a competitor influences the company by launching a new technology. The *2008/2009 crisis* presented companies with a big challenge. However, the crisis is not only seen as a burden that companies have to cope with; it is also seen as an opportunity to question established, self-evident processes which were not questioned for a while once established. Thus, the crisis can be seen either as an opportunity to improve the company or as an incident for which the company has to be prepared in order to deal with it in a suitable way. In Company B, the crisis was a starting point to question existing processes and think about how to make them leaner. In comparison, Company C prepares in advance for a crisis situation by conducting risk assessments and developing scenarios to simulate changes on the market. As the examples show, the crisis is an incident for which companies have to prepare in advance; a management strategy is needed to deal with the crisis.

To anticipate trends and crises in advance, the company needs to sense and seize them, and if they prove to be an important development or possible threat, appropriate adaptation is needed. Table 25 provides an overview of the market trends reported and issues by the interviewees.

7.2 Flexibility Needs as Reasons for Business Model Changes

Company	Paraphrased market trends and issues
A: #00:08:46-0#	Consolidation of the semiconductor industry in Japan and drifting of companies towards China and Korea have changed the market and offer opportunities.
B: #00:01:27-1#	Mega-trends like changes in the environment and in end-users change the automotive market all over the world. The company meets these trends by following a niche strategy.
B: #00:13:24-2#	One trend in the automotive industry was moving east into low-cost labor countries. Thus, a new location was developed in Czech Republic. A global footprint is important in order to be close to the customer.
B: #00:11:18-9#, #00:36:24-3#	The crisis is a starting point at which to question processes and think about making them leaner. With the help of the mid-term plan, changes are synchronized and stimulate faster adaptation, as required during the crisis.
B: #00:30:16-7#	Congresses are a good opportunities to identify new openings on the market and gain new insights.
C: #00:19:08-1#	Risk assessment and scenario techniques are used to cope with crises and changes on the market.
C: #00:28:54-5#	Changes on the market pushed active change in the company from being purely an electronics supplier to a supplier of engines and power-trains as well. This offers customers the opportunity to buy from a single source.
C: #00:45:11-9#, #00:45:56-3#	Competitors have a strong influence on the business model of the company, for example if they launch a new technology.
D: #00:32:48-0#, #01:29:47-2#	The convergence of topics (e.g. telecommunication and toll collection systems) influences the business model and the entire business process. For example, multinationals like Google identified the car as a platform for new opportunities.
E: #00:37:57-7#	Price changes in technology and subsidies for technologies (e.g. solar collectors) make them affordable to customers. This changes the business model because customers have changed from being consumers only to producers of their own power.
E: #00:37:17-5#, #00:44:35-3#, #00:49:32-9#	The energy market has changed over the past several years and does not work in the same way as before. This has an influence on the portfolio, on the business model and also on the network because new participants are appearing on the market.
F: #00:21:33-5#	Anticipating developments of new products on the market helps to forecast demands on machines customers will require (e.g. Apple launches the new iPad).
I: #00:33:12-0#	Turmoil on the market resulted in the company now only investing 5% in the semiconductor industry. The focus now is on technical products in the medical industry.
J: #00:07:55-7#	Market demands led the company to develop a web shop.
L: #00:23:51-6#	Sales were compared in the segments served in the different regions in order to identify changes.
L: #00:17:00-5#	Changes in the product are caused by customer requirements and the trends identified, such as market trends or technology trends.
L: #00:02:10-9#	A supplier becomes more and more of a competitor. This drives the change to internalize core competences again.
O: #00:38:48-7#	Changes in the pharmaceutical branch are challenges for the company in terms of new products, changed aspirations in pharmaceutical study methods, and competitors appearing from all over the world.
P: #00:14:59-2#, #00:29:18-9#	General trends in the various branches lead the company to implement adaptations. These trends are scanned together once a year with branch experts and futurologists.
Q: #00:17:42-5#, #00:32:35-9#	Developments and changes in the market segments drive decisions and changes in the company. Knowledge of the customer, market, and better technologies for the future are required in order to differentiate.
R: #00:17:27-9#	Technological changes and trends on the market can be observed and realized in the organization step by step.
R: #00:44:15-6#	Trends in the market (e.g. Internet of the things) create new opportunities for revenues. Consequences for products, customers, customer applications, end-users of the customer product and so on need to be evaluated.

Company	Paraphrased market trends and issues
S: #00:04:14-2#	Adaptations to changes in the market take place on a regular basis. For example, the automotive market changes regularly in terms of technologies or geographically. The value proposition must fit the market needs.
T: #00:38:48-6#	The oil crisis led to a search for alternative fuels. The business was driven by the fear of running out of oil.

Table 25: External driving factors in the form of market trends and issues

7.2.1.2 Customer Requirements

Customers influence the company with their changing demands, demands that differ between the countries in which the company is operating, or demands as a result of trends in the industry. These changes may concern individual projects because of the uniqueness of every project, or concern the entire business activities of the company. For the companies interviewed, the business activities of the company are oriented predominantly towards customer requirements, as presented in table 26. Company P, for example, reported that customers are increasingly demanding more services. As the company is driven by customer needs, they needed to adapt the BM accordingly. In comparison, Company Q reported that changes in the BM are always driven by interesting project ideas from customers, like the decision to expand into the new market segment of IC substrate. In order to meet customer needs, the company has to appreciate and fulfill these needs.

Company	Paraphrased customer requirements
A: #00:07:40-2#	The main drivers of change are customers in terms of increasing demands, especially concerning tablets and smartphones.
B: #00:01:46-4#	The expectations of customers differ between countries all over the world. Adjustments need to be made to comply with these geographical variations.
C: #00:16:33-9#, #00:45:11-9#	Customers strongly influence the business model. They require great flexibility due to requirements that cannot be realized easily.
E: #00:05:01-8#, #00:13:02-3#, #00:15:43-6#	Customers in the energy sector concentrate more on their core competencies and outsource other activities. This led the company to take the responsibility for technical maintenance of a refinery.
F: #00:19:52-0#	Customer requirements are the primary concern. All processes are designed to implement customer requirements; processes are designed for change.
F: #00:20:22-0#	Customer changes are anticipated as well as possible to ascertain how many machines will be required and be able to plan in this respect.
G: #00:15:00-2#	Volatility of the customer market complicates planning in terms of employees, machines and raw materials.
H: #00:12:03-8#	The voice of the customer is important, stating what he/she needs and what is he/she willing to pay for it. Customers require the product in a high-quality at low cost.
I: #00:03:49-2#, #00:19:27-6#	The drivers are changes on the market in terms of customers and how to handle them. It is important to react to fluctuations in manufacturing due to changing customer needs.
J: #00:25:17-6#	The market pushes the development towards considering service as very important and making a profit in this sector.

Company	Paraphrased customer requirements
K: #00:30:18-4#	Customers and the globalization of our customers triggered the decision to go east and follow them.
M: #00:34:03-7#, #00:44:39-4#, #00:47:42-2#, #00:55:26-3#	Due to rising costs, customers demand that the company uses more standard IT in their products.
N: #00:25:11-3#	Customer inquiries drive changes in the company and the business model and lead to adaptations thereto.
P: #00:40:15-1#	Customers need to be offered more services. The company is driven by the market through the customers.
P: #00:41:08-8#	International partners need a partner who operates internationally; this is postulated by customers.
Q: #00:19:07-8#	The predictability of customers' production volume is only seen very vaguely; projects can also be stopped. Company needs the flexibility to compensate for such uncertainties.
Q: #00:31:22-4#	Changes in the business model are always driven by the customers; they approach the company with interesting projects. For example, the new IC substrate market segment was instigated by a customer need.
S: #00:11:47-2#	The company is driven by the customer; if the customer changes its direction, the company can follow or has to follow.
T: #00:30:37-3#, #00:32:10-7#	Customers are drivers; the needs of customers should be identified at organized events to which customers are invited.

Table 26: External driving factors in the form of customer requirements

7.2.1.3 Political and Legal Authorities

Especially those companies operating in branches that are subject to restrictions and regulations reported on the influence of political and legal authorities and the requirements to adapt the BM to these regulations. These are decisions that influence the whole branch and force the company to adapt accordingly. However, new opportunities arising due to new regulations also initiate changes in the BM, at least for Company E. Company E reported that deregulation of the energy market and all topics in relation to it influenced their BM and required adaptation; but it also provided business opportunities. Company O has to deal with different standards and regulations regarding the indications and prices of pharmaceutical products in countries to which they want to expand. This always requires adaptations to the BM. Thus, especially those companies in branches that are subject to such regulations are forced to adapt the business model regularly to changing restrictions and regulations. Table 26 provides evidence on the influencing factors of political and legal authorities as reported.

Company	Paraphrased driving factors from political and legal authorities
E: #00:37:17-5#	Legal restrictions and regulations influence business in the energy sectors. The deregulation in Europe, the free energy market and all topics related to this are important triggers for change.
N: #00:44:44-6#	Legal restrictions influence business and are different in every country.

Company	Paraphrased driving factors from political and legal authorities
O: #00:10:05-9#	Regulations that are different in every country force the company to adapt their business model to the regulations there.
O: #00:22:41-3#	Insurance companies exert high price pressure on companies in the pharmaceutical industry. Not all service can be offered at the price demanded.
T: #00:08:18-7#	Changes on the market in the form of new regulations; attempts are made to influence the decisions on new regulations in advance (e.g. standardization of the quality of bio fuels).
T: #00:05:55-4#, #00:13:10-3#	Due to the dependence on political factors, changes need to be identified early on in order to be able to react to them. Political uncertainties force the company to develop a third key pillar in renewable energies through R&D or M&A.

Table 27: External driving factors by political and legal authorities

7.2.2 Driving Factors within the Company

Besides the external factors reported and presented in the previous section, several internal factors are reported as also driving changes in the BM. One main internal driver is the steady growth pursued by the company by changing or enlarging the product portfolio, by forward integration, or by mergers and acquisitions (M&A). These growth opportunities very often require reorganization in the form of structures and processes. Further internal drivers are the need to reduce costs as well as the internal innovation activities driven by the company. Company I reported that the growth demanded by the company itself and its owners changed the product portfolio; new products are integrated and others disappear. Company Q needed to reduce costs to secure a competitive advantage. Thus, a new plant was established in China to achieve cheaper manufacturing. In Company G, the innovativeness of individuals led to development of the new acoustics business area. Table 28 provides an overview of the internal factors reported as driving changes in the BM. Furthermore, it is shown that the driving factor was a growth activity, reorganization, innovation or cost reduction.

Company	Paraphrased internal driving factors	Specific trigger
A: #00:10:45-9#	Change of the organization towards key accounts counter-balances direct customers and distribution channels.	Reorganization
C: #00:01:51-7#	Two change processes initiated by the company: qualitative initiative to ensure the right quality, and reorganization due to fast growth of the company from a small enterprise to a medium-sized enterprise. Additionally, teams were added, enabling the company to accompany the product throughout its life cycle.	Reorganization
D: #00:59:04-6#	Company launched a growth program with research institutes to look towards new business models or segments and find new business opportunities far removed from its traditional business.	Growth
D: #01:06:17-3#	Innovation is very important in the company; it is also promoted, and the company benefits from it. Internal development teams drove the business very much and developed many ideas. In the past, a lot was conducted internally because the company was too much a technology company.	Innovation

7.2 Flexibility Needs as Reasons for Business Model Changes

Company	Paraphrased internal driving factors	Specific trigger
D: #01:07:20-8#	Gaps identified in the product portfolio or competence portfolio are very often closed by means of M&A. These M&A also have market-related reasons and effects on technologies.	Growth
E: #00:19:30-2#	High costs inside the organization drive changes in order to find a solution. Sometimes the solution is to change the business model completely.	Cost reduction
F: #00:33:01-6#	Internal decision can be to push forward with the same technology into a new segment or with a new technology in a new segment or related market. If the market potential is available, the company tries to adapt the processes, structures and machines in order to be successful on the market.	Growth
G: #00:34:41-4#	The innovativeness of individuals led to development of the new acoustics business area. Individuals to drive the innovation and resources are necessary at the beginning of such developments.	Innovation
H: #00:02:40-7#; #00:21:26-8#, #00:25:19-4#, #00:53:23-0#, #00:54:23-9#	Decisions by the board and the corporate group, respectively, are drivers of business model changes (e.g. affiliation to dietary supplements).	Growth
H: #00:26:45-5#, #00:29:30-1#	Cost pressure in the company meant that processes had to be adapted to fulfill key figures. Thus, no orders of less than 2000 packages are accepted anymore.	Cost reduction
H: #00:18:26-1#, #00:51:50-3#	In order to make use of underutilized capacities and develop a second pillar, the company was looking for third-party customers. This was perhaps also the reason for moving in the direction of dietary supplement products.	Growth
H: #00:25:59-0#	10 years ago, the new three-layer technology applied was the first trigger to move into niche markets. It was a good decision because the company was able to build on it. If there is no longer any demand for it in the future, the company will have to look for a new niche market.	Innovation
H: #00:28:15-0#, #00:29:42-5#	The decision not to hire new staff led to changes in the business model because the same number of people need to perform the same tasks and more. This led to changes in the business processes, especially manufacturing, packaging and quality inspection.	Cost reduction
I: #00:04:18-5#, #00:46:00-4#	A huge driver is growth, pushed by the company and the owners. As a result of growth activities, new products were integrated into the portfolio and others disappeared.	Growth
J: #00:01:22-0#, #00:24:40-3#	Company growth was the trigger for the need to reorganize the whole company.	Growth
K: #00:33:17-4#	The company concentrates on making core competencies more focused and dictating the market by offering more products within its own core competence.	Growth
K: #00:09:17-3#	Internal decision to establish product business, which is a completely new direction for the company.	Innovation
L: #00:25:10-9#	Ideas can be received from sales or from business units with a new market idea.	Innovation
L: #00:14:51-5#	New customers are won and their problems are solved by offering solutions that were not planned, but further developed by offering them to several customers.	Innovation
L: #00:01:17-5#	Company growth and the new size forced the company to establish new structures.	Growth
M: #00:05:56-0#	Change from a medium-sized company to an international corporate group created the need for reorganization.	Reorganization

7.2 Flexibility Needs as Reasons for Business Model Changes

Company	Paraphrased internal driving factors	Specific trigger
M: #00:27:41-6#	Internal innovation management analyzes trends in consumer areas and considers how to integrate them into the company's own products. This is presented to the customers in order to obtain feedback and be recognized as technology leader. The goal is implementation at the customer's facility.	Innovation
N: #00:04:43-8#	Internal decisions led to enlarged business in the biotech sector; this is an enlargement in application of the company's core competence.	Growth
O: #00:55:02-2#	Strategic decision by the corporate group to go east and west provided the chance to produce for new markets.	Growth
O: #00:36:50-2#	Innovative solutions in transportation of medication offered new opportunities in providing the products in the home care sector.	Innovation
P: #00:41:21-2#	The size of the company pushes internal changes and development towards decentralization.	Reorganization
Q: #00:10:29-5#	The cost pressure forced the company to open a plant in China.	Cost reduction
R: #00:16:41-9#	Reorganization of the organizational structure from a divisional structure to an organization in business areas.	Reorganization
R: #00:19:08-8#	Internal discussions on the business model offer new business opportunities (e.g. new customer segments). This provides growth opportunities.	Growth
T: #00:16:54-1#	Development of the company's own product through strong focus on R&D. This is a step towards the manufacturing industry.	Innovation

Table 28: Drivers from within the company

7.2.3 Flexibility Needs Constituted by External and Internal Driving Factors

In the last few paragraphs, several external and internal factors driving change were presented that indicate a need for flexibility in the BM. Several needs for flexibility can be derived from these driving factors (see figure 38). Looking at the internal driving factors, two flexibility needs were ascertained. The need to *actively pursue growth activities* is based on the growth activities within the company, actions taken to reduce costs, and reorganizations. In order to grow further, Company H added third-party customers in order to exploit underutilized capacities. Company E and Company H both stated that the need to reduce costs was a trigger for changes in processes and the BM. In Company H, cost reduction targets were imposed by the corporate group. After a period of growth, reorganization is needed. Reorganization is also needed to prepare the company for further growth in the future, as explained by Company J. Additional signals indicating the need for growth activities are M&A (e.g. Company D) or adding new competencies (e.g. Company H, Company L). Based on innovation activities by the company, the flexibility need for *exploration of innovative ideas* emerges. Companies innovate and focus on R&D to establish new businesses (e.g. Company G, Company H) or actively propose opportunities for the customer by offering innovative products (e.g. Company M, Company O).

The flexibility need to *sense, seize and adapt to market trends and issues* emerges from trends and issues on the market in the form of industry trends (e.g. Company A, Company B), product

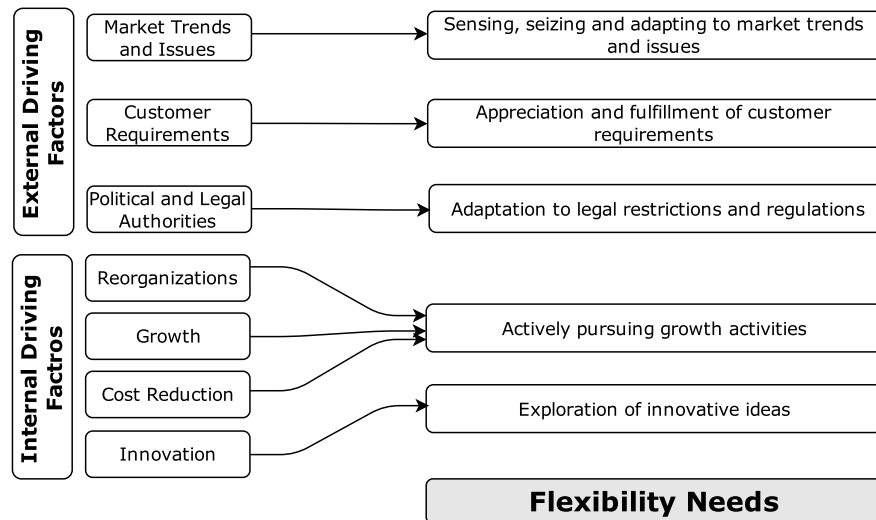


Figure 38: Flexibility needs set up by different internal and external driving factors (own illustration)

and technological trends (e.g. Company D, Company R) or crises (e.g. Company B, Company C). In addition to these trends with the focus on industry or technological changes, the specific needs and requirements of the customer require flexibility in the BM. These requirements can be varying customer expectations in different countries, as reported by Company B, or the uncertainty of customer demands and customer projects, which inhibit internal planning, as Company F, Company I or Company Q reported. Thus, there is a flexibility need that can be termed *appreciation and fulfillment of customer requirements*. In this research context, a lot of companies are subject to political and legal restrictions and regulations and have to adapt accordingly. As a result, there is a need for flexibility in terms of *adaptation to legal restrictions and regulations*. This need is reported explicitly by Company N in the biotech industry and Company O in the pharmaceutical industry, as well as by Company E in the energy industry and Company T, which develops plants for producing biodiesel.

Based on the needs identified for flexibility, the next section describes how these needs influence the BM and its individual elements and lead to changes either in single elements or in the entire BM.

7.3 Business Model Changes Triggered by Flexibility Needs

The business model and its elements are interconnected, as shown in the literature review in section 4.2.5 and in the description of the BM in section 7.1. Due to this interconnection, changes in one element initiate changes in other elements. Casadesus-Masanell and Ricart

(2011, p. 102p) describe this in the form of choices of actions taken and the consequences of these choices. This section reveals which flexibility needs lead to changes in which BM element and how other elements are influenced by this.

The analysis of the interviews revealed that the value proposition is mainly influenced by internal and external driving factors, leading to further changes in the BM. However, the *value creation* and the *customer* elements also cause business model changes and influence the other elements, be this directly or indirectly. The paraphrased evidence of BM changes and BM elements influenced, as identified in the interviews, can be found in appendix A.5. The following sections explain the BM elements affected by flexibility needs as causes for BM changes.

7.3.1 Value Proposition Causing Business Model Changes

The interviews revealed the *value proposition* as a BM element commonly influenced by internal and external driving factors and thus leading to changes in the BM. These changes can be in the form of additional services or products provided or new solutions because of changed customer requirements. The reasons for changing the value proposition are mainly trends in the market, differing customer requirements or internal growth activities arising from opportunities identified by the company. The newly developed or modified value proposition is usually accompanied by changes in *value creation* through new resources or competences required for realization of the value proposition or a change in the *value capture* due to new revenue streams. From the 20 companies interviewed, 17 on about changes in the value proposition in the BM. For example, the trend on the energy market towards alternative forms of power supply prompted Company E to think about the usage patterns of their gas power stations. This required the company to change existing contracts and services to accommodate the new usage habits for gas power stations, with the goal of providing benefits for both the customer and the company. Company S was asked by the customer about the possibility of manufacturing a huge LED monitor. All capabilities for manufacturing the LED monitor were available at the company, except the LED technology itself. An appropriate partner needed to be found who could provide the LED technology in order to manufacture the LED monitor. Table 29 presents four examples of companies initiating BM changes by changing the value proposition. Additionally, case vignette 8 shows in more detail why and how Company R changed the value proposition and the consequences for the other elements in the BM.

7.3 Business Model Changes Triggered by Flexibility Needs

	Need for change	Value proposition changes	Additional BM elements changed
Company E	Changes in the energy market led to the development of many wind farms and implementation of solar energy in Europe.	The usage of gas power changed. Gas power stations are used in a reduced form; only when it is dark or no wind is blowing.	All contracts and services need to be changed to suit the new gas power usage. A solution to solve this technically (<i>value creation</i>) and a benefit for both the customer and the company (<i>value capture</i>) are required.
Company L	Attempts are being made to meet customer requirements and solve problems.	Modular system offers possibilities to add new, improve existing or combine new and existing technologies.	This new offering faces development as well (<i>value creation</i>), but provides the opportunity to enter a new market (<i>customer</i>).
Company R	Internal discussions on growth possibilities.	Realization through additional services or asking the customer for existing applications where the product can be integrated as well.	Adding additional services or integrating the product into the customer application offers revenue opportunities (<i>value capture</i>).
Company S	Customer requested manufacture of an LED monitor.	Offering the LED monitor as a new business segment; all required skills are available except the LED technology.	Searching for a partner to provide the LED technology (<i>value creation</i>).

Table 29: Changes in the business model as a result of changing value propositions

A substantial change was implemented by *Company R* recently. They changed from being a very product- and technically oriented company to become a company structured according to business models. *Company R* realized that their business models were very independent and different from one another, so structuring the company according to business models seemed appropriate. Business models range from *drive engineering*, where the company operates as a retailer, *system technology*, where specific industry solutions (e.g. hydraulic solutions) are manufactured, *electronic systems* where electronic components are manufactured, *facility engineering* and also *service and maintenance* for facilities established. As *Company R* is a very traditional business, trends are seen in advance, allowing time to prepare and adapt accordingly. Trends and technological developments are discussed during strategy meetings, and their significance for the BM is assessed in order to earn more money in specific segments. *Company R* emphasized that a simple discussion of the business model and possible target groups or target markets led the company to additional growth opportunities. Also, new business opportunities came up as a result of discussions on offering additional products and/or services in sectors where products are already being offered. For example, the company supplies hydraulic components for a specific customer application. If the customer has additional applications that may also need hydraulic components, but another purchaser is actually responsible for this, the company needs to discuss the possibility of also delivering hydraulic components for the other applications with the customer. In order to identify these additional business opportunities, *Company R* emphasized the importance of actively asking the customer about his applications. Thus, in addition to discussions in the strategy meeting, discussions with the customer provide additional opportunities as well. *Company R* further highlighted that changes in the business model should be treated holistically wherever consequences appear. For example, if

the value proposition is divided into different functionalities, new functionalities can be added if needed. This can create a need for new suppliers or competencies, thus changing value creation. In addition, this creates costs that are reflected in the revenue model. For Company R, the single elements cannot be seen in isolation because they influence each other mutually.

Case vignette 8: Company R: Changes in value proposition and their influence on other BM elements

Figure 39 presents the results in the form of a graph. The dashed lines show which flexibility needs cause changes in the value proposition. These flexibility needs are market trends (e.g. Company E), growth activities (e.g. Company R) and customer requirements (e.g. Company L and Company S). The broadest arrow between value proposition and value creation represents the direct influence of value proposition on value creation. This means that changes in the value proposition lead directly to changes in value creation. The arrow between value proposition and value capture depicts the direct as well as the indirect relationship between these two elements. Changes in the value proposition lead directly to changes in the value capture, but also indirectly via another element, for example value creation. The thinnest arrow between value proposition and customer element shows that customers and target groups, respectively, are only influenced indirectly by changes in the value proposition, mainly through the value creation element.

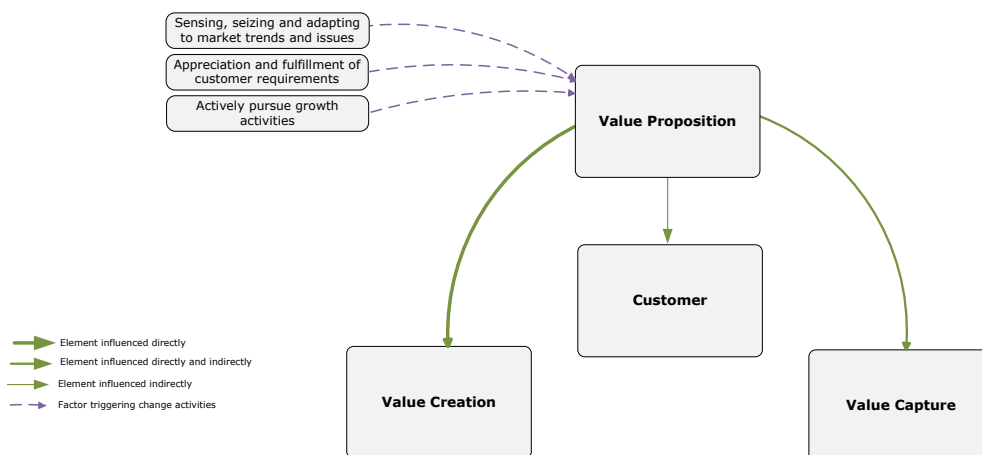


Figure 39: Value proposition causes changes in the business model (own illustration)

7.3.2 Value Creation Causing Changes in the Business Model

Value creation is also strongly influenced by internal and external factors. The factors initiating these changes are market trends, customer requirements or internal decisions on growth activities through cost reduction or innovation. Market trends or internal innovation activities

provide new knowledge of future requirements or new technologies that might be important in improving value proposition. Then, however, the value proposition has to be adapted. But adaptation of the value creation can also open the doors to new customer segments or require establishment of new sales channels in order to supply the value proposition to the customer. For example, Company B had the goal of increasing its own productivity, with the consequence that several processes had to be optimized, including delivery to the customer. In the case of Company K, the customer was driving the globalization strategy in the company. Thus, value creation had to change because new knowledge and structures are needed in order to offer the same or modified products to customers in a foreign country. The goal of Company K was to increase revenues with this strategic initiative. The examples of three companies that changed their value creation are summarized in table 30. Case vignette 9 shows the consequences of changing value creation to comply with the globalization strategy on the business model of Company K in more detail.

	Need for change	Value creation changes	Additional BM elements changed
Company B	Decision to increase productivity.	Optimizations are realized throughout the value chain, from choosing the supplier, to supply of materials and the in-house supply chain.	Optimization also in delivery to the customer (<i>customer</i>).
Company G	Internal developments not yet demanded by the market, but the company expects a trend in this direction.	1-2 developments a year to provide something new.	These new developments should not always be small modifications, but may also be a small jump in innovation (<i>value proposition</i>).
Company K	Globalization because of customers going east.	Influences the company in terms of internal cooperation and knowledge transfer required for this.	Opportunity for the company to grow with an existing customer, offering the same or a similar product (<i>value proposition</i>) with the goal of increasing revenues (<i>value capture</i>).

Table 30: Changes in the business model as a result of changing value creation

Figure 40 shows the flexibility needs that drive changes in value creation and the elements influenced by this. The need for changes in value creation is created by such factors as new customer requirements (e.g. Company K), trends on the market (e.g. Company D), or internal factors like growth activities, including cost reductions and innovation activities (e.g. Company B and G). The broad arrow between value creation and value proposition and the customer element, respectively, signifies that changes in value creation has a direct influence on value proposition and the customer element. The arrow between value creation and value capture shows that, in some cases, the element is influenced directly by changes in value creation, and in some cases it is influenced indirectly by changes in value proposition, for example.

The core business of Company K is the supply of turnkey production systems for several industries (e.g. automotive, electronics, consumer goods or medical technology and health care). The company operates as a general contractor working together closely with subsidiaries as well as technology and research partners to accomplish projects. Company K saw very strong growth in the past few years, which also changed the BM. They saw an opportunity to grow further by following customers into foreign countries because additional growth potentials were identified in offering the customer the same or almost the same system for a plant in the foreign country. This internationalization strategy was seen as an opportunity to increase revenue and also influence people inside the organization. Globalization spreads knowledge around the world instead of concentrating it in one location. Thus, stronger internal cooperation and knowledge transfer are needed. Despite the organizational changes necessary, following the customer into foreign countries is seen as a source of potential growth for Company K.

Case vignette 9: Company K: Changes in value creation and their influence on other BM elements

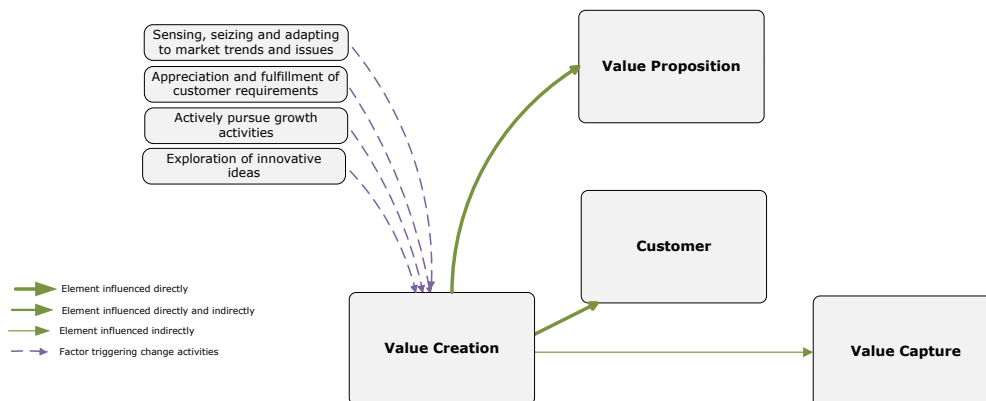


Figure 40: Value creation causes changes in the business model (own illustration)

7.3.3 Customer Element Causing Changes in the Business Model

Changes relating to the customer structure in the business model are driven by internal growth activities or customer requirements. Internal growth activities comprise, for example, the decision to offer the value proposition to a new customer segment. Changing customer requirements may lead to the decision to add a new channel. In the case of Company C, the decision only to consider large customers in the future required adaptation of the value proposition and value creation alike because all processes and the product were designed for small units. The transition from small to large customer segments changed both the value proposition and value creation. Company J decided to develop a web shop following customer

requests. They started to sell those products that do not need particular training through the web shop. This decision had consequences for value creation and value capture because all processes and revenue mechanisms had to be adapted towards the new sales channel. In comparison, Company M moved forward from being a project sub-contractor towards becoming an integrator. This changed the customer base because customers are now end-customers. It also changed the value proposition because services are now required in addition to the products offered. In addition, value creation needed to change because the company now deals with customer problems, thus facing higher risks. These changes had an influence on value capture as well. The examples of three companies are summarized in table 31. Case vignette 10 shows the decision of Company J to add a web shop as an additional sales channel and all the consequences inherent in this in more detail.

	Need for change	Customer element changes	Additional BM elements changed
Company C	Decision to change the customer focus towards large customers.	Addressing customers. only large-	The electronics and the technologies were not prepared for this, resulting in changes in the product (<i>value proposition</i>), quality standards and also logistics. Units changed from small and medium to large. Processes and the mindset of employees needed to change as well. (<i>value creation</i>)
Company J	Customers require a web shop.	Product sales through the web shop.	Definition of rules on revenues (<i>value capture</i>) and services needed (<i>value creation</i>). Also product development needed to be different because usage of the product has to be clear when buying through the web shop. Furthermore, logistics and warehousing needed to change as well. (<i>value creation</i>)
Company M	Decision to change from project sub-contractor towards integrator.	Customer is now the end-customer.	The product changes as a result of added services (<i>value proposition</i>); something different is sold - the company now deals with customer problems, thus the risk is also higher (<i>value creation</i>); the revenue stream changes as well (<i>value capture</i>).

Table 31: Changes in the business model as a result of changing the customer element

Figure 41 illustrates the growth activities (e.g. Company C, Company M) and customer requirements (e.g. Company J) as flexibility needs drive changes in the customer element and in the elements influenced by this. All elements in the BM – value creation, value capture and value proposition – are influenced directly by a change in the customer element. This does not necessarily mean that all elements always need to change the same degree. For example, at Company J, both value creation and value capture changed when the web shop was implemented, whereas at Company C, the customer element change influenced the value proposition and the value creation elements. However, changing the customer element can also lead to adaptation of all elements, as was the case at Company M. Thus, a change in customer element may result in a change in the entire business model.

High-technology measurement systems are sold by *Company J* and required specific training in order to operate these systems properly. Nevertheless, Company J decided to develop a web shop and sell some of their measurement systems through this web shop. At the moment, only very simple measurement systems that do not require specific training are available from the web shop. The reasons for implementation of the web shop were market demands in the form of customer requirements, and Company J saw this requirement as an opportunity for further growth. As a result, Company J's products are no longer sold through subsidiaries only; this required new regulations in terms of revenues and service provision. As from this point, the measurement systems were developed by Company J and sold to subsidiaries at a specific percentage of the list price. The subsidiaries sell the products at the list price and use the difference to cover sales and service effort. This procedure changed upon implementation of the web shop because the subsidiary no longer earns any money, but is still responsible for service. Thus, a different solution had to be found. In addition, product development needed to change as well because if no training is provided when the measurement system is bought, the products have to be developed in such a way that no training is necessary. Instead, customers receive an instruction manual and the products must work right away. In addition, the order processing and production to stock processes had to change in order to guarantee availability of the product when ordered. This requires integration of all new processes and regulations into the existing business model.

Case vignette 10: Company J: Changes in the customer element and their influence on other elements

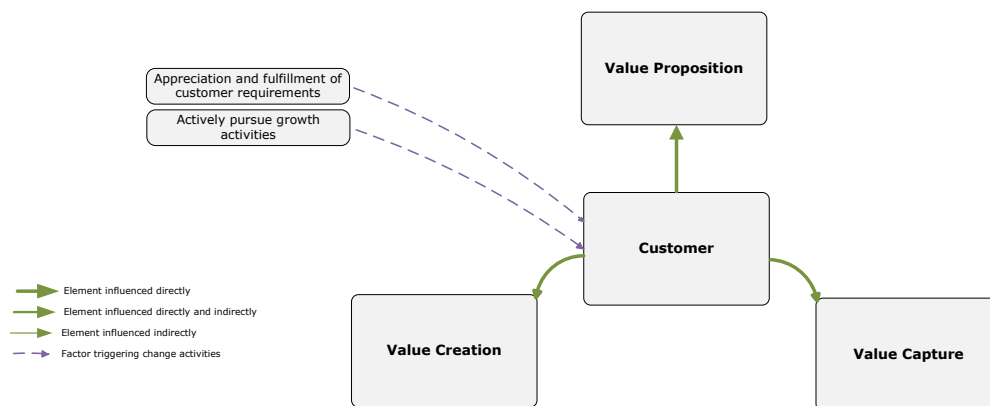


Figure 41: Customer element causes changes in the business model (own illustration)

7.4 Flexibility Potentials to Cover Flexibility Needs

So far, the factors requiring a change in the BM have been described, as well as illustrating which elements are influenced by these factors and induce changes in the BM. This section

Flexibility Potentials	
Value Proposition	Product Modularity
Value Creation	Establishment of External Partnerships
	Competence Robustness
	Task and Process Versatility
Customer	Sense and Accumulate Information on Customer Needs
Whole Business Model	Market Sensitivity
	Change Readiness - Openness and Willingness to Change, Open Communication, Having the Right People
	Management of Risks and Learning
	Leadership and Commitment
	Organizational Preparation

Table 32: Flexibility potentials identified

shows how companies can prepare their BM for situations of change in order to handle these situations more effectively. Thus, *flexibility potentials* are necessary, as shown in figure 2, section 2.3. Flexibility potentials are determined by the ability of the system to cover flexibility needs induced by internal and external driving factors. The flexibility potentials identified in this research, as shown in table 32, are located on the one hand in single elements of the BM, and on the other hand apply to the general changeability of the BM as a whole. Flexibility potentials were identified in the value proposition, value creation and in the customer elements, but most of them relate to the general changeability of the BM, enabling a company to realize changes in its business model. The subsequent sections describe the flexibility potentials identified and show in more detail which flexibility needs these potentials cover. The paraphrased evidence of flexibility potentials identified in the interviews can be found in appendix A.6.

7.4.1 Flexibility Potentials in Value Proposition

The need to develop a modular product architecture is mainly provoked by customer requirements. Customers require tailor-made solutions that suit their needs perfectly. This relates mainly to project business, but also to product business. Thus, companies need to find a way to develop and manufacture products according to these needs without adding more complexity to the company. Besides this, companies using a modular product architecture can grow easily by using the same basic product and adapting it according to the needs of each branch or customer. The measurement systems developed by Company L are based on a modular product architecture and can be assembled according to the needs of each

customer through a simple “plug-and-play” system (see case vignette 12). Company P uses their modular product architecture as the basis for specific applications in every branch they serve (see case vignette 11). The modular structure means that modules can be integrated and deleted easily, which reduces complexity and enhances the company’s flexibility at the same time. Both Company P and Company L use the modular architecture of their product to offer new possibilities for their customers and adapt to trends in the market. Company L reported on new possibilities by adding new technologies or combining them in a new way in order to secure new customer segments. Figure 42 illustrates which internal and external driving factors determining the flexibility needs to appreciate and fulfill customer needs and adapt to market trends can be covered by a modular product architecture in Company L and Company P.

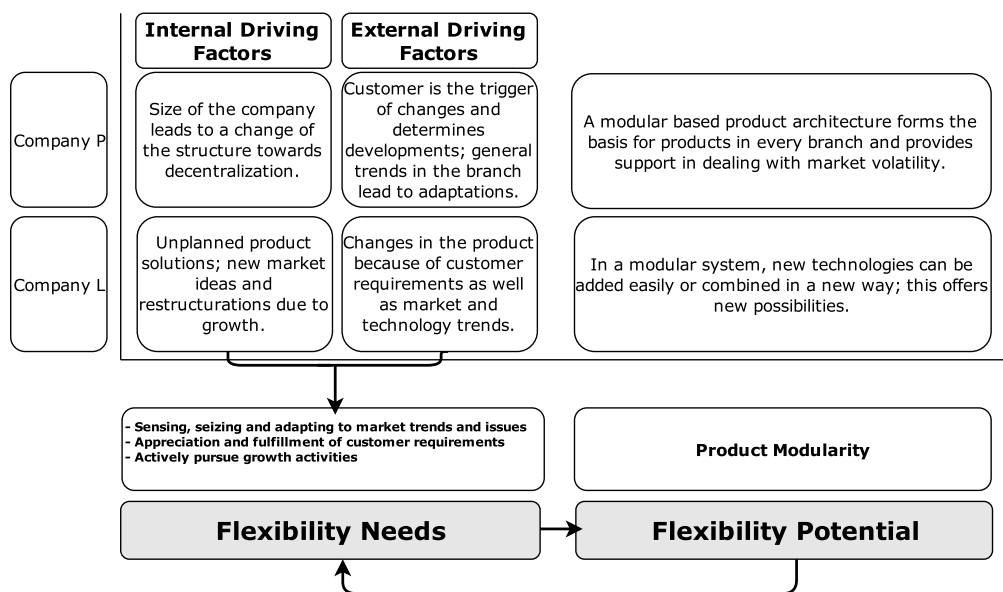


Figure 42: Flexibility potential of product modularity (own illustration)

The core business of *Company P* is operating as a solution provider of automatic warehouse logistics for customers operating in several branches (e.g. cosmetics, food, pharmaceuticals or fashion). *Company P* designates itself as a technology provider for logistic processes in these branches. The business model is determined by a combination of know-how and knowledge of the requirements of their customers – the end-customer. Rapid changes and constantly changing customer requirements shape the daily business of *Company P*. In order to grow and remain successful, *Company P* developed from being a purely engineering company to become a solution provider responsible for the implementation, maintenance and improvement of the system throughout the life cycle. In order to handle these rapid changes, the company developed single system components that help to improve customer needs in every branch. These single system components were combined in a *construction kit* that can be used flexibly in any branch and should help eliminate the complexity

inherent in this mix of branches, regions and rapidly changing customer requirements. This offers the advantage of using the same product modules in all branches and being flexible towards variations in branches.

Case vignette 11: Company P: Product modularity based on requirements of the branch and the customer

Company L has two different business models – one offering measurement techniques for engineers to verify prototypes and one for monitoring and surveillance of electronics and power supply. With the measurement techniques for engineers, *Company L* provides a flexible tool to verify and test prototypes developed. The measurement system needs to be adapted flexibly according to the needs of the engineer. Customer requirements, unsolved customer problems, but also market and technology trends drive the BM and new developments. Customers are the main trigger of changes within the company. These new requirements or customer problems influence the value proposition in terms of new technologies that need to be integrated, the improvement of existing technologies, a combination of new and existing technologies, or issues with which the company has no experience so far. *Company L* explains that a modular system offers new ways of integrating new technologies easily. As an example, they reported on integration of a thermo-cam into the product. This opens the door to new markets and customers that the company had not previously considered. *Company L* explained that potential solutions can be offered to new customers as a result of these small adaptations. This is an ongoing process within the company.

Case vignette 12: Company L: Product modularity based on customer requirements or unplanned solutions

As the examples show, product modularity enables companies to reduce complexity and thereby increase flexibility in order to survive in a volatile environment. The possibilities provided by the fast and easy-to-use *plug-and-play* modules enhances the speed by which tailor-made customer solutions can be provided and offers further possibilities to serve new customer segments or develop new value propositions.

7.4.2 Flexibility Potentials in Value Creation

Value creation describes how the value proposition is developed for the customer in terms of processes, resources and competencies. In order to save costs and remain flexible, it is important to work together with partners or develop capabilities and processes that are able to absorb the dynamics provoked by environmental changes.

7.4.2.1 Establishment of External Partnerships

Network partners provide flexibility in many ways. First of all, partners can be seen as a *resource* possibly offering external competencies; or they provide capacities (e.g. in manufacturing) if internal capacities are fully utilized. This helps companies to deal flexibly with volatilities in market needs. Company P, for example, uses network partners to source capacities in terms of manufacturing or development (see case vignette 13). Treating the external environment as a *slack resource* is important in order to cope with changing customer requirements. Moreover, partners are good providers of new and interesting topics that are important for the company to seize future business opportunities or prepare for future restrictions and regulations. For Company T, standard bodies and research institutions are important in discussions on new and interesting topics and cooperation if possible. Working together with standardization bodies further prepares the company for upcoming regulations, which can be influenced prior to the final decision and enable the company to adapt well in advance in order to comply with new regulations (see case vignette 14). Figure 43 explains how establishing partnerships can meet the needs of growth, adapting to legal restrictions and regulations as well as the appreciation and fulfillment of customer needs.

The business model of *Company P* has already been described in case vignette 11. The branches in which Company P operates are very volatile; the main drivers of the company are customers demanding more and more consulting and additional services. Customers also need an international partner, forcing Company P to operate internationally. As a result of these growth and internationalization activities, Company P established a decentralized structure to handle these demands more effectively. Company P developed into an industry partner, managing the entire product life cycle. These partnerships apply not only to customers, but also move in the direction of suppliers as well as universities. External partners need to be reliable; in terms of suppliers, this means reliability in providing capacities. Thus, suppliers developed into partners that are also integrated into the product development process. The company changed its sourcing strategy towards single source because they recognized that reliable and trustworthy partners are important in order to have a sustainable and successful business model. Key components are still developed and manufactured in-house, but can be outsourced to a certain degree as well. Complete development topics are also outsourced to partners from whom Company P then purchases the development. This partner network provides flexibility as the company establishes additional capacities. Furthermore, partnerships have the advantage that not everything needs to be developed in-house. An important factor here is the win-win situation for both the company and the partner.

Case vignette 13: Company P: Flexibility by sourcing capacities from network partners

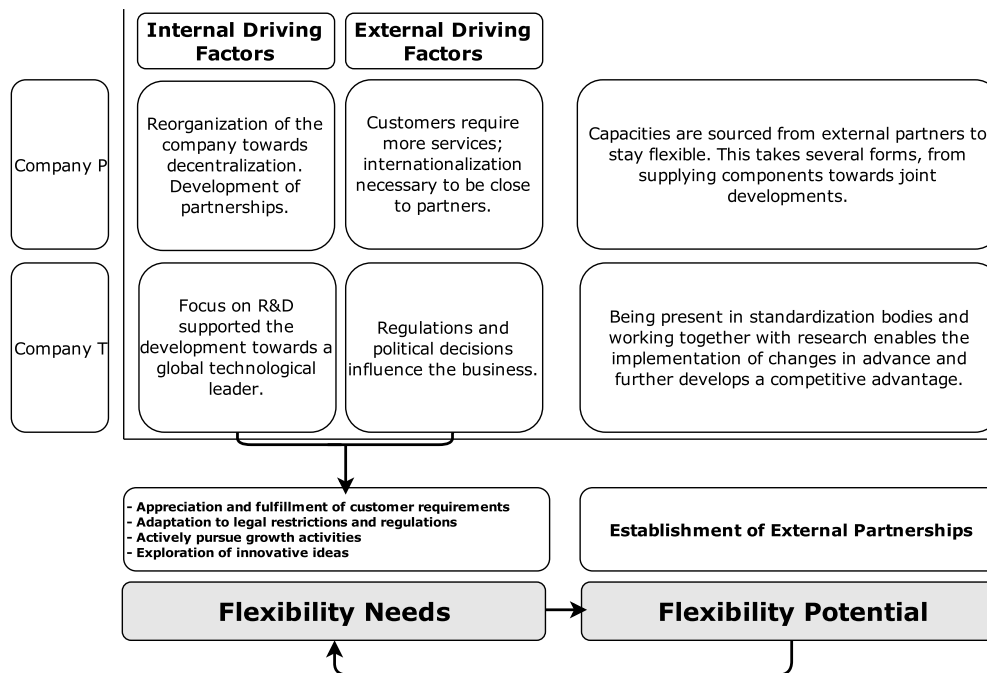


Figure 43: Flexibility potential of establishment of external partnerships (own illustration)

Offering technologies in the field of renewable energy is the business model of *Company T*. *Company T* operates as a classic plant construction firm, concentrating on the utilization of waste. Specializing in biodiesel and biogas plants, the company recently developed a third key pillar, where they analyze existing biodiesel plants to identify errors and improvement potentials. *Company T*'s responsibilities as a general contractor include fulfillment of the contract and support services for the customer throughout the project; these tasks span basic engineering, detailed engineering, purchase of the entire equipment from sub-suppliers, construction of the entire plant or having the plant built under the supervision of the general contractor, and after-sales services. Ever since it began this work, *Company T*'s business has been characterized by working closely with research institutions and universities because most of their employees are university graduates. Universities and research institutions support the company in technological developments. In addition, they provide information on future topics and are available for discussion of future developments. In addition, *Company T* is very dependent on political conditions and development thereof in their markets. In order to recognize changes and react to them as quickly as possible, *Company T* actively participates in advisory bodies that shape such changes. This participation gives the company the opportunity to benefit from the regulations in developing products ahead of competitors. *Company T* reported an example relating to the development of norms for biodiesel. They saw a tendency where different parameters would be stricter in terms of quality and used this information to develop their technology in line with these requirements and produce biodiesel with a better quality than their competitors. Due to the importance of R&D in the company, this

gave them a competitive advantage. The focus on R&D and the close partnership with universities helped Company T to develop towards becoming a global technological leader.

Case vignette 14: Company T: Flexibility through information exchange with network partners

Working together with external companies provides the opportunity to concentrate on core competencies and gain new knowledge on technological developments, restrictions and regulations. The external sourcing of competencies increases the speed at which actions can be taken because internal developments take more time and very often also cost more. In addition, information on future developments at an early stage provides an opportunity to proceed proactively and develop products ahead of competitors, which also yields a competitive advantage.

7.4.2.2 Competence Robustness

In order to hold their own in the dynamic environment that high-technology companies face, they need to develop specific core competencies to survive and distinguish themselves from competitors. New ideas and developments should help to improve these core competences. In order to fulfill customer needs, adapt to market trends and ensure steady growth, core competencies act as a “tower of strength” in an area of uncertain and unforeseen developments. Company A (see case vignette 15) reports that a core competence provides uniform results in a dynamic environment. Adjustments or improvements should be made around this core. For Company J, technological developments are imperative, as are strengthening and extending existing competencies. Thus, more than 20% of revenues are invested to improve technological competencies (see case vignette 16). Strengthening competencies is perceived as an important issue in achieving success and improvement. Figure 44 shows how competence robustness supports Company A and Company J in covering the needs of growth, changing customer requirements, and sensing, seizing and adapting to market trends.

The market in which *Company A* operates is highly dynamic. Especially the rapidly changing customer demands in consumer segments for smartphones and tablets have forced the company to make constant improvements. The general conditions on the market also drive the business. Within the past few years, the semiconductor market in Japan was consolidated; companies migrated from Japan towards China and Korea. As a result the demand in the Japanese market could not be satisfied, which offered business opportunities for Company A. Company A is also driven by the need for constant growth, both organically and inorganically. In order to cope with these requirements, company A emphasizes the importance of developing a core competence in the company and ways of improving this core competence in order to achieve a constant result. Thus, this core competence should provide stability in such a volatile environment. In the case of

Company A, the stable core element is the development of microchips, designated by Company A as their *DNA*. This stable core element can be leveraged by adding processes and competencies. The core is the center of the company and it can be extended at the periphery. For example, a distribution channel was added to create a balance between direct customers and distributors. In addition, the company decided to establish more competencies in software development. Thus, for Company A it is important to have people in the organization who are able to specify and develop good chips as well as having production capacities available to fulfill the constantly changing needs of the market. The importance of having robust processes and competencies that are able to absorb the dynamics emanated by customers is also emphasized by Company A.

Case vignette 15: Company A: Competence robustness through development of core competencies

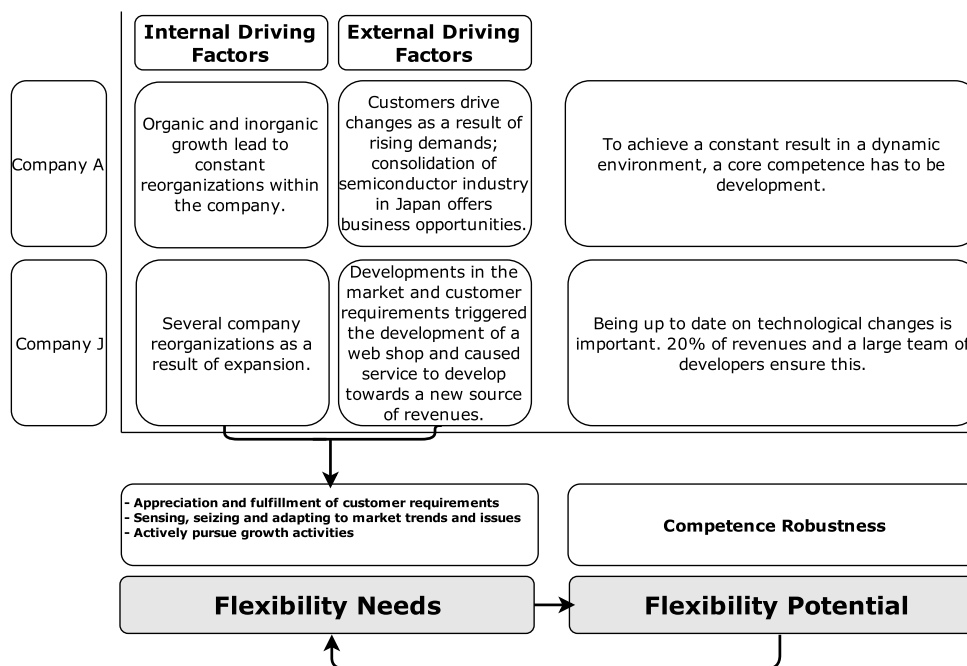


Figure 44: Flexibility potential of competence robustness (own illustration)

High-technology measurement systems for laboratory and process use form the core business of *Company J*. Customers operate in different branches, like the beverage industry, oil industry or pharmaceutical industry. The value proposition *Company J* provides to their customers is a *measurement* for which the measurement system is needed. This value proposition is the same in all branches. The company has seen several years of strong growth. Within the past 10 years, it has grown from 400 employees to more than 2000 employees, with several subsidiaries for development work, but mainly for sales and service in America, Europe and the Asia-Pacific region. This growth triggered several reorganizations in the company to deal with this growth. *Company J* is still

managed by the founding family and is, therefore, very independent in terms of external financing and development partners; most of their components are developed and manufactured within the company. The new development of a web shop and the strengthening of services as a source of new revenues are trends provoked by market and customer requirements. As in Company J, it is always very important to be at the cutting-edge of new technological developments. The company has established a good competence base with internal developers and invests about 20% of annual revenues in new developments. Constant growth over the past few years highlights the importance of reinforcing and further developing the company's own competencies.

Case vignette 16: Company J: The importance of technological improvements

A robust competency defines the scope of action in the company and provides stability in uncertain and volatile environments. By adding activities and processes to this core element, the company can create additional business opportunities, extend the core business and create new value propositions for the customer. This ensures further growth opportunities and a uniform result.

7.4.2.3 Task and Process Versatility

Companies reported the importance of task and process versatility in order to handle changing requirements. A certain degree of versatility is required, mainly in view of specific customer requirements or reorganizations in the company due to growth activities or cost pressure. Company H explained that, especially in the manufacturing of pharmaceutical products, people need the capability to change tasks under their own initiative in order to provide the flexibility promised to their customers (see case vignette 18). This ability must be anchored in every single employee. Processes are clearly defined in Company C, but customers want to have their projects completed much faster. However, for Company C it is imperative to ensure the quality of their products, which is guaranteed by the processes defined (see case vignette 17). Nevertheless, the company tries to adjust as well as possible to meet customer needs. For both Company C and Company H, it is important to adapt processes and tasks to a certain extent in order to fulfill customer requirements, but still be able to ensure quality (see figure 45).

Customers require very high flexibility, especially customers in the USA. This was reported by *Company C*, highlighting the importance of flexibility towards the customer. The company has to find a means of fulfilling these customer needs. In general, the company is more *active* than *reactive*, which means that actions are taken in advance in order to be prepared for the future and thus secure a competitive advantage. As a result, Company C launched two initiatives: The quality initiative should guarantee a high product quality despite the company's rapid growth. The second initiative was the reorganization project, where teams are added during project execution

to accompany the product throughout its life cycle. Using this quality initiative, Company C defined product development processes. For the company, it is important not to depart from these processes in ensuring the quality of the products due to the company's responsibility for this aspect. However, a certain kind of flexibility is important in order to fulfill customer requirements. For example, if a customer needs a project to be realized in six months, but the product development cycle is nine months, a solution has to be found between the two time scales. This requires good communication with the customer to find a solution that satisfies both.

Case vignette 17: Company C: Process versatility to fulfill customer needs

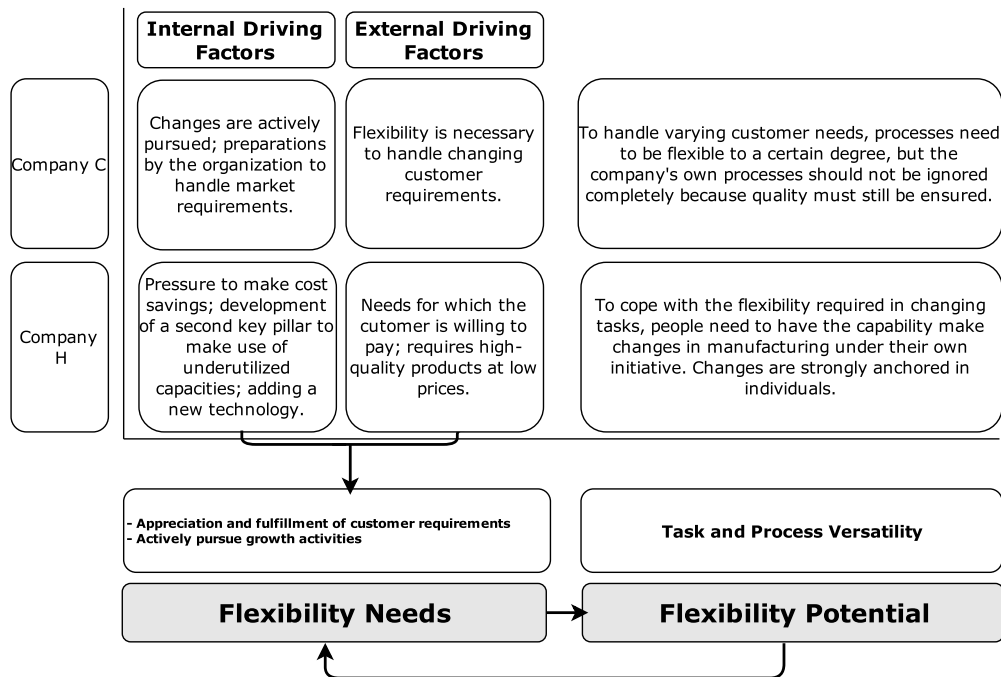


Figure 45: Flexibility potential of task and process versatility (own illustration)

For *Company H*, flexibility constitutes a core competence and must be supported by every single person in the company. Company H operates as a low-volume manufacturer of pharmaceutical and dietary supplement products, mainly for the corporate group. In the past few years, the company actively pursued growth by developing a second key pillar with third-party customers to make use of underutilized manufacturing capacities and strengthen the company's own competencies. Ten years ago, the company also decided to apply the three-layer-technology in the company, offering the means of manufacturing a tablet incorporating three different ingredients. The growth activities and focus on low-volume production very quickly changed the tasks of people working in manufacturing. Thus, people were needed who were able to cope with these changing tasks; they had to have the capability to implement changes under their own initiative. However, these

frequent changes also mean higher costs within the organization. As the cost pressure is very high, from the corporate group as well as the customer, Company H tried to find a balance between flexibility and cost minimization. Thus, it was decided only to manufacture volumes upwards of 2000 packages; manufacturing smaller volumes means that the company is always tied up in changing processes for different products. This minimum volume should also secure quality and minimize failure rates.

Case vignette 18: Company H: Process and task versatility to fulfill customer needs

As the examples show, tasks and processes have to be clearly defined in order to ensure high quality and guarantee that employees know their tasks well. But tasks and processes also have to provide a means of coping with changing situations, and employees have to be able to switch between tasks quickly and under their own initiative. This enables the company to fulfill changing customer needs as quickly as possible and, at the same time, guarantees the quality of products and service.

7.4.3 Flexibility Potentials in the Customer Element

The core of the business model are the customers served and their needs, as explained in section 7.1. In order to anticipate customer needs early on, information is required on current and future needs. Growth activities pursued by the company and the demand to fulfill customer requirements require proximity to the customer in order to anticipate and integrate needs into the business model at an early stage. This requires sensing of these requirements from the customer and further accumulation and processing of these changes inside the company. Proximity to the customer from development to manufacturing is imperative for Company B (see case vignette 19). At first, people from sales and engineering are in contact with the customer to discuss the specific requirements of the product. This proximity is also needed during manufacturing to align possible changes. Company G highlights the importance of providing information on the customer to everyone in the company. For this purpose, a CRM tool was implemented that guarantees the availability of important information on the customer (see case vignette 20). Figure 46 illustrates the examples of Company B and Company G and the way in which they sense and accumulate information on customer needs.

The main business of *Company B* is the development and production of technological products in the form of magnets for the automotive industry. Company B does not supply directly to the end-customer as it operates as a tier-1 and tier-2 subcontractor. The products offered are tailor-made for their customers in the market niches of CO₂-reduction, security, where specific design principles for product safety labels have to be fulfilled, and comfort, where the end-customer pays for greater comfort. Company B has to deal with several external trends and developments in

this branch, but also with differing customer expectations in countries all over the world. This forces the company to adjust in accordance with geographical conditions. With the help of the company's own academy for idea generation, new ideas are generated and developed to enhance innovativeness and enable the company to act as technology leader. In addition, proximity to the customer is essential. This should not only be handled by sales people, but also by technicians who are able to understand customer problems, from general requirements of the product up to adjustments during manufacturing. As the life cycle of the product is 3-5 years, the product also changes as a result of new knowledge gained, requiring it to be adapted accordingly. Thus, a good relationship and constant communication with the customer is very important.

Case vignette 19: Company B: Sensing and accumulation of information on customer needs

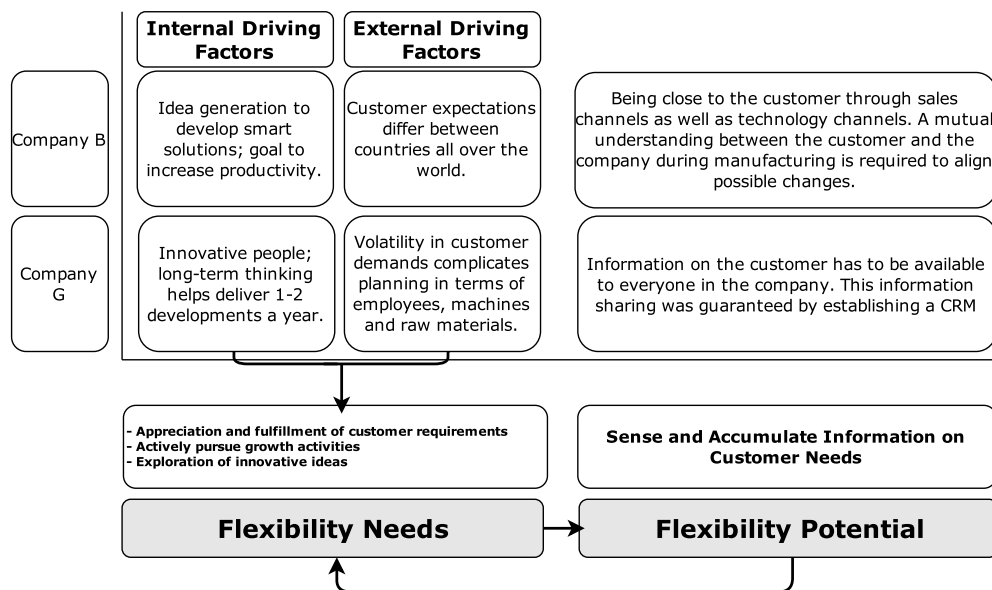


Figure 46: Flexibility potential of sensing and accumulating information on customer needs (own illustration)

In *Company G*, insulating materials are manufactured for business segments like energy or aviation and transportation. In the interview, the energy business unit, which differentiates between high-voltage equipment and low-voltage and transformers, was considered in detail. The business was and still is very conservative, but is currently undergoing several changes. One development in the industry is that companies focus on their core competencies, leading to a closer relationship with several suppliers that goes beyond the classic customer-supplier relationship. These cooperation structures developed into real partnerships, with partners also being involved in developments by the company. This is the case with suppliers as well as with customers and other partners. Especially those changes in customer requirements should be identified as soon as possible by all those close to the customer. *Company G* reported that it is important to bundle the information

received and pass it on within the organization because no product manager, sales manager or business unit manager can talk to the customer all the time. Thus, a CRM tool should provide this information within the company all around the world for everyone who needs it. With the help of this tool, the obligation to provide the information is fulfilled; from now on, it is the obligation of the people responsible for developments and innovation to use the information provided.

Case vignette 20: Company G: Sensing and accumulation of information on customer needs

Sensing customer requirements well in advance offers companies the opportunity to solve customer problems early on and opens up new business opportunities thanks to the knowledge of customer needs at an early stage. Discussions and open communication with the customer provides the company with information prior to the emergence of customer requirements, and the company can take action to offer customers a value proposition proactively.

7.4.4 Flexibility Potentials of the Business Model as a Whole

Several capabilities were reported that cannot be assigned to a specific business model element. However, these capabilities are important flexibility potentials necessary to ensure the changeability of the business model. These capabilities are kinds of *meta-capabilities* in the form of a precondition enabling change. Market sensitivity, organizational preparedness or leadership and commitment of the management team, to name but a few, are such capabilities.

7.4.4.1 Market Sensitivity

Sensitivity towards changes and developments in the market is imperative in order to sense and seize market trends, identify and fulfill customer requirements and prepare in advance for handling legal restrictions and regulations as well as situations of crisis (see figure 47). Companies take several actions in this respect, such as constant market research and analysis, discussions with branch experts or simulation of developments in the market. Company O implemented specific processes to identify and shape changes in the company. Specific workshops with customers are an example of this, as described in case vignette 21. In addition, they work closely with public authorities to gain information on new regulations in advance, and can also shape these regulations prior to submission and take the necessary steps accordingly. Company T is vigilant according to the same information gained from different locations and stakeholders. Within the management team, such information should be sensed and discussed to find a way of proceeding further (see case vignette 22). Both companies highlight the importance of proactive sensing of changes in the market to anticipate shifts as early as possible.

Changes in the pharmaceutical industry take place on a regular basis, as reported by *Company O*. These are new reforms or regulations implemented by the government or insights from customer experience in terms of actual requirements in pain therapy. In order to identify these changes, *Company O* implemented *processes that recognize and shape the change*. *Company O* fulfills this by active interaction with customers and public authorities. In the event of new reforms or regulations, *Company O* works closely with public authorities by participating in committees to obtain information on these changes well in advance. Based on this information, decisions can be discussed before reforms and regulations come into effect. In order to obtain information from customers, *Company O* organizes special events with information on current issues in pain therapy, what additional requirements customers have of the products, processes and so on. This helps the company to develop solutions together with other participants.

Case vignette 21: *Company O*: Development of sensitivity towards the market

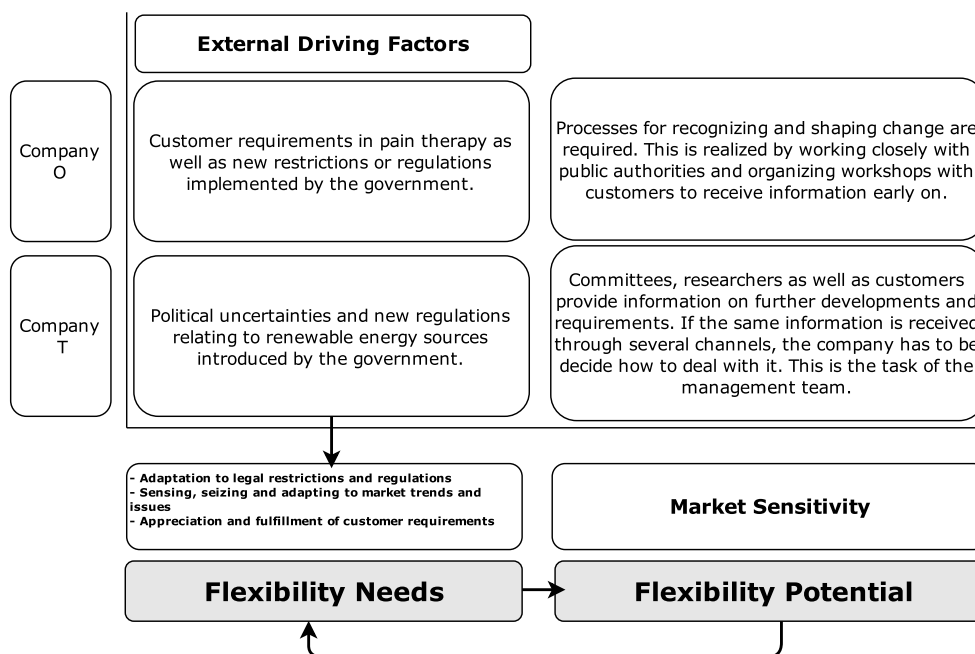


Figure 47: Flexibility potential of market sensitivity (own illustration)

The business of *Company T* was already described in case vignette 14. According to *Company T*, sensitivity towards the market is essential, especially in order to sense changes in political regulations and anticipate information on new technologies or customer needs. Knowledge of political factors is required in the business of renewable energy sources; all difficulties and possibilities must be sensed as early as possible in order to find a fast solution or leave the market segment. *Company T* obtains this information by working closely with researchers, participating actively in committees

or organizing events for customers to discuss developments and requirements in the future. Besides this, salespeople are required to sense information on the customer. If information or trends are sensed from several different channels, the company has to decide how to deal with it. Thus, the management team meets on a regular basis to sense and seize information on possible changes in the market. In addition, individual departments are encouraged to do this in their annual review of business plans; new topics have to be seized if they are important.

Case vignette 22: Company T: Development of sensitivity towards the market

As the examples show, the customer is also considered when sensing the market. This is clearly because the customer is an important part of the market; but the market includes many more issues than the customer alone. Market sensitivity enhancement is necessary because information on developments in terms of new regulations, technological developments and also customer requirements are sensed proactively and anticipated, offering opportunities to act proactively and allow companies to use the information sensed in order to create a competitive advantage.

7.4.4.2 Change Readiness

Change readiness expresses the general ability of a company to handle situations of change. It is mainly characterized by the *corporate culture*, defining conventions on how to handle situations of change in the organization. Thus, it is defined as being how changes are communicated within the organization as well as how employees experience and deal with unfamiliar situations. Such factors as *openness towards and willingness to change*, *open communication* and the *right people* to make the new direction possible are required. As all of these factors are reported as being imperative when it comes to BM changes, they are explained in more detail in the following paragraphs. In order to emphasize the importance of these issues, examples of change readiness in Company D (see case vignette 23) and Company T (see case vignette 24) should help provide a better understanding. Change readiness is a precondition for every flexibility need because willingness to change, open communication and people who take account of this are required in order to make it a success. Figure 48 summarizes change readiness at Company D and Company T.

Openness and willingness to change: Openness and willingness to change was emphasized by almost all the companies interviewed. Openness determines how *openly* the company deals with uncertainties and newly emerging, challenging situations. Willingness expresses how *willing* people are to sense and realize new possibilities within the company. Both Company D and Company T highlighted these factors, whereas Company T explicitly describes them as success factors in change activities.

Open communication: Open communication was also reported as an important issue when it comes to change; it was described as being key in overcoming barriers and fear of change. Open communication is needed especially when it comes to reorganizations in the company in terms of structures, processes and activities. However, active communication of customer needs within the organizations can also be considered within this issue. In order to eliminate fear barriers and realize changes holistically, Company D pursues an open dialog in situations of change.

Having the right people: Another key factor when it comes to BM changes is having people in the company with the right competencies. In the interviews, the importance of having a diverse employee base with different experience and know-how as well as the attitude of every single person towards innovation and change were emphasized. People need to be creative and think “out of the box”. Company D reported on the willingness of people to think in an *entrepreneurial way*, which also needs to be encouraged by the company itself. Company T explained that *visionaries* are necessary because they are able to think in an unconventional way. In addition to a team to generate ideas for a new BM, Company T emphasized the importance of having a team for implementation of these new ideas.

Company D is a family-run company, which has become an international, multi-structured corporate group; but the founding family and their basic values are still present and relevant in the company. The corporate culture and the values defined there are vital to Company D; they are implemented and lived in daily business. Transparency, discipline and family are important values, but also dynamics and the discipline to be dynamic have high priority. Establishing an attitude to appreciate change and the necessary actions for this was especially challenging for employees. Sticking to values instead of departing from them is especially important in times of change. Company D is a very innovative company; innovation has a high priority and thus is promoted, benefitting the company internally. Internal development teams are still driving the business and develop many ideas. However, the company is also moving towards inorganic growth; M&A should help to fill gaps in the product and competence portfolio. Despite this development, internal company development is still very important and also includes the growth program launched together with research institutes. The goal here is to look at new business models or business segments far removed from traditional business, but which might be interesting and offer enough potential for business. A successful spin-off already resulted from this growth program. Trends on the market and the company's own aspirations towards innovation and growth require people in the organization who are open to such new directions. For Company D, the organization must demand and encourage the ability and willingness to change, with both a top-down and a bottom-up approach. The top-down approach requires leaders who actively pursue change management and participate in change initiatives. People who are willing to think in an entrepreneurial way, who not only accept the change, but also drive it from the bottom up are also very important. As

a result, people are needed who not only do their job, but think out of the box and question habits within the organization. Another success factor for change is internal communication. Open communication removes fear barriers and accompanies changes. A need for change must be presented with transparency. Company D emphasizes that a company should only be changed within a specific range without leaving its existing culture, values and roots.

Case vignette 23: Company D: Change readiness in a multi-structured corporate group

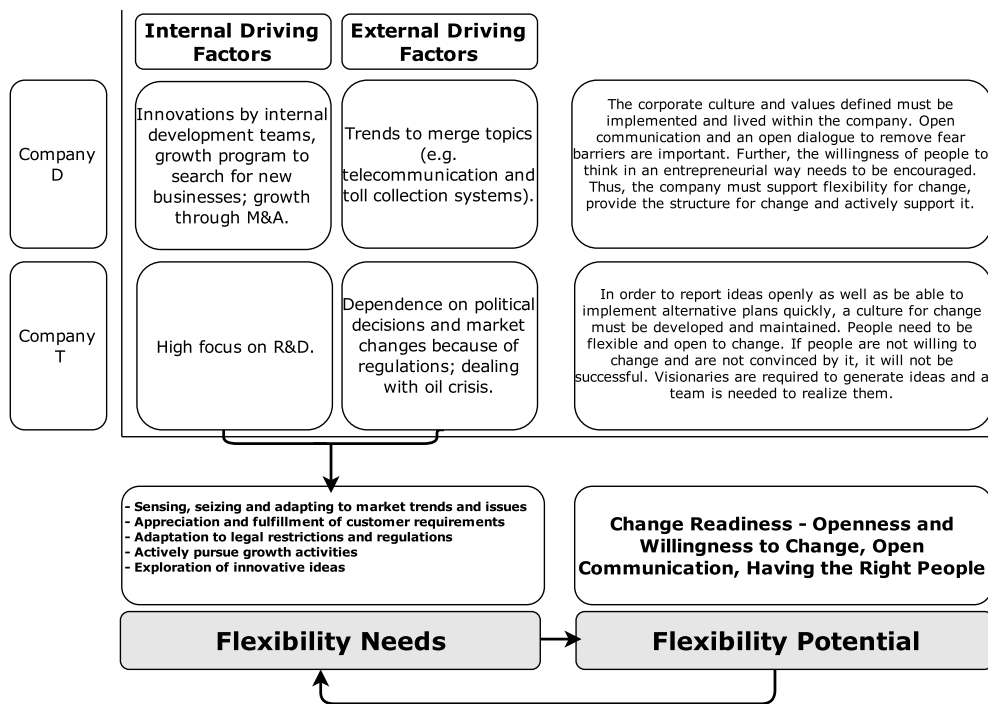


Figure 48: Flexibility potential of change readiness (own illustration)

Company T is very innovative; R&D has a high priority in the company. This can be tied to the close relationship with the Graz University of Technology, where a lot of R&D is conducted jointly. This close cooperation also leveraged Company T into the position of a global technology leader in the development of biodiesel plants. As Company T is very dependent on political factors in terms of regulations, they participate in standard bodies to influence political decisions and adapt accordingly at an early stage. Ever since the beginning, political and public issues created challenges for Company T in both a positive and a negative way. For example, the oil crisis stimulated the search for alternative fuels, which in turn encouraged the possibility of converting plant and animal oils into biofuels. This was a boost for Company T and enabled it to take a leading position in this business. On the other hand, public opinion on biofuels and the use of food resources in production hurt Company T, although they use waste products and not food. These situations require the Company to be flexible and change the business model. To counteract

such political uncertainties, Company T decided, therefore, to establish a second key pillar in the form of biogas business and later a third key pillar in analyzing and improving existing plants. Such situations are also challenging for employees, who need to be flexible as well. If people are not willing to change and are not convinced by this, it will not be successful. Thus, a culture of change is required, where ideas can be reported openly and alternative plans implemented quickly. A precondition for this is the availability of visionaries who do not stick only to daily business, but are unconventional thinkers, sensing opportunities, questioning issues sensed and thinking about how these issues can provide an attractive opportunity for the company. In addition to having the right team to create ideas for business model improvements, a team is required to realize these ideas. It is up to the executive board to create a culture for change and provide opportunities and the necessary structures to sense and discuss information.

Case vignette 24: Company T: Change readiness in a company conducting intensive R&D

All issues described in connection with change readiness are important for high-technology companies to identify and pursue innovative ideas. By being prepared in terms of culture, willingness and competencies of the people involved, actions take effect more quickly because the barriers to change are very low. This importance was clearly highlighted by the two examples described in case vignette 23 and case vignette 24, where change readiness is a key factor for innovativeness.

7.4.4.3 Management of Risks and Learning

Both risks and learning need specific management processes, institutionalized within the company. Companies need to be aware in advance of the risks involved in the actions taken, but they also need to take risks in order to learn and improve. The companies interviewed established different methods and processes to manage these tasks. Company A implemented a Plan-Do-Check-Act cycle to show variances and develop countermeasures if needed. Furthermore, they launched an improvement program to learn about and develop new ideas. The results of this program were to define measures and actions to be taken. Company C implemented a risk assessment policy to identify possible threats provoked by changed environmental conditions. By developing different scenarios, possible circumstances and their consequences for the company can be simulated. Both tasks are handled by the management team once in each quarter. External trends, changing customer requirements and the threat of a crisis, but also the exploration of innovative ideas require the company to manage risks and learning in a professional way, as shown by the examples of Company A (case vignette 25) and Company C (case vignette 26) and summarized in figure 49.

The semiconductor industry is very dynamic. This dynamism is driven by customers in consumer markets, short product life cycles, cooperation by companies as well as companies' own growth activities, consisting of organic as well as inorganic growth achieved by checking continuously which companies are available for sale. Constant changes are the norm at *Company A*. In order to identify changes and develop countermeasures, *Company A* implemented a continuous *plan-do-check-act cycle*. This process is intended to reveal variances and changes by measuring defined KPIs deduced from the strategic objectives within the company. If variances are identified, suitable countermeasures are developed. *Company A* reported that the most challenging part is the definition of the right categories to be measured. The structure of these measurements is similar to those in a balanced scorecard and consists of revenues, market-product developments or employee developments. Once a year, the business model is reviewed based on the results of these measurements. In addition, the business model canvas is used to analyze strengths and weaknesses in order to define potentials for improvement. Besides this, the improvement program established should help to gather new ideas and create awareness for new topics and innovations.

Case vignette 25: *Company A*: Management and actions for developments and improvements

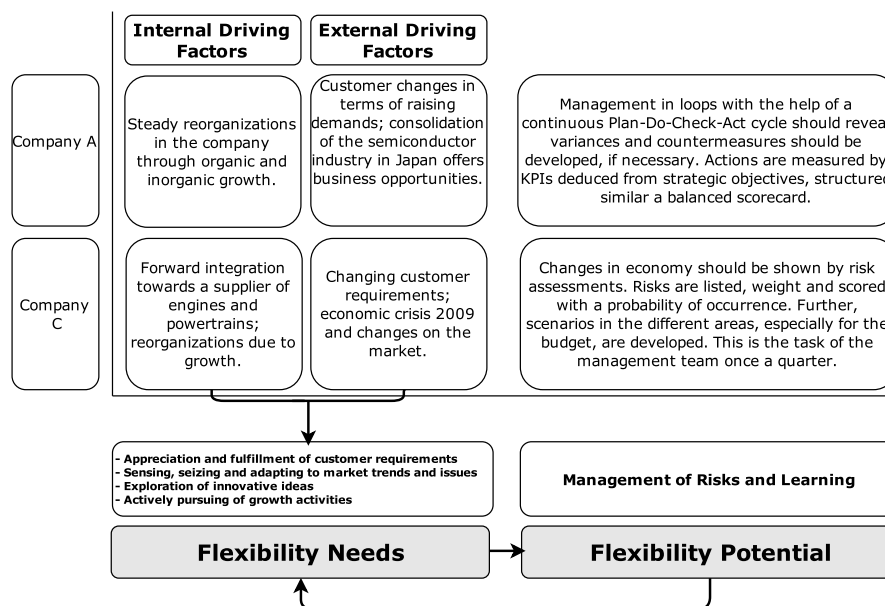


Figure 49: Flexibility potential of management of risks and learning (own illustration)

Company C pursues a very active rather than a reactive strategy. Changes on the market are known, but the company tries actively to influence the market. One example in their business field showed that, by sensing the value chain, they recognized that companies tend to move forward. *Company C* realized that the current position in the value chain will not be sustainable. Consequently they decided to change the business model and move forward from being an electronics supplier to

offering motion control. This gives customers the opportunity to purchase from a single source and Company C the chance to double its revenues. In order to perceive changes early on, Company C conducts risk assessments and develops different scenarios of possible market evolutions. In the case of the economic crisis in 2009, they assessed what actions would be necessary if the economy were to collapse further. Additional risk assessments are conducted in the quality sector to see how the company should handle substantial damage or risks concerning the market. In order to assess risks, they are listed, weighted and assessed according to the probability of occurrence, similar to the FMEA method. The scenario technique is used in different areas of the company (e.g. budgeting). This leads to discussions on scenarios, such as how to scale the company if revenues are falling. The advisory committee of the supervisory board is responsible for this, and countermeasures should also be developed. In addition, a quarterly workshop is conducted focusing on developments on the market and how to react to them.

Case vignette 26: Company C: Risk assessment and scenario development

The management of risks and learning helps to prepare for crisis situations and also prepare the company for this. Risks taken in new opportunities not only provide revenues due to new opportunities because of the risks taken, but also help to learn from mistakes. Activities for managing possible risks in the environment should help to prepare countermeasures in advance.

7.4.4.4 Leadership and Commitment of the Management Team

Managers occupy an important position when it comes to changes in the organization. First, they need the experience and skills to identify changes and must also be empowered to realize these changes. Second, when it comes to implementation within the organization, the commitment of the management team is essential; it is an important precondition for implementing directional shifts successfully. Company F emphasizes the importance of a manager's gut feeling, which requires no specific knowledge. They identified the highest potential for improvements in the alignment of topics within the organization (see case vignette 27). Company K reports on a steering committee responsible for changes and the importance of decision-makers here (see case vignette 28). The presence of an experienced leader and his/her commitment towards decisions eliminates fears and helps to raise the general change competence within the organization. Especially internal growth activities, reorganizations or new ideas require a leader to drive the topic within the company. Figure 50 summarizes the examples of Company F and Company K concerning leadership and commitment when it comes to business model changes.

The primary concern for *Company F* is customer requirements. Changes in the business model mainly deal with fulfilling these customer requirements and providing customers with a better

service. This is realized in changing business processes, which are designed for this purpose. If potentials are available on the market, Company F also considers the possibilities of pushing forward with the same technology into a new segment or with a new technology in a new segment or related market. As a consequence, business processes need to be changed, structures must be adapted and machines also have to change. However, Company F highlighted that the most important capability in driving a change is a *gut feeling*, which they see as an important part of leadership. They highlight this capability because the main potentials for improvement are topics with the focus on aligning activities and not topics where specialized knowledge is necessary. Having an overview over all processes helps to improve them and make them more efficient. Excellent qualifications are required anyway, but to improve processes, a gut feeling as well as a company overview are crucial.

Case vignette 27: Company F: The importance of leaders' gut feeling

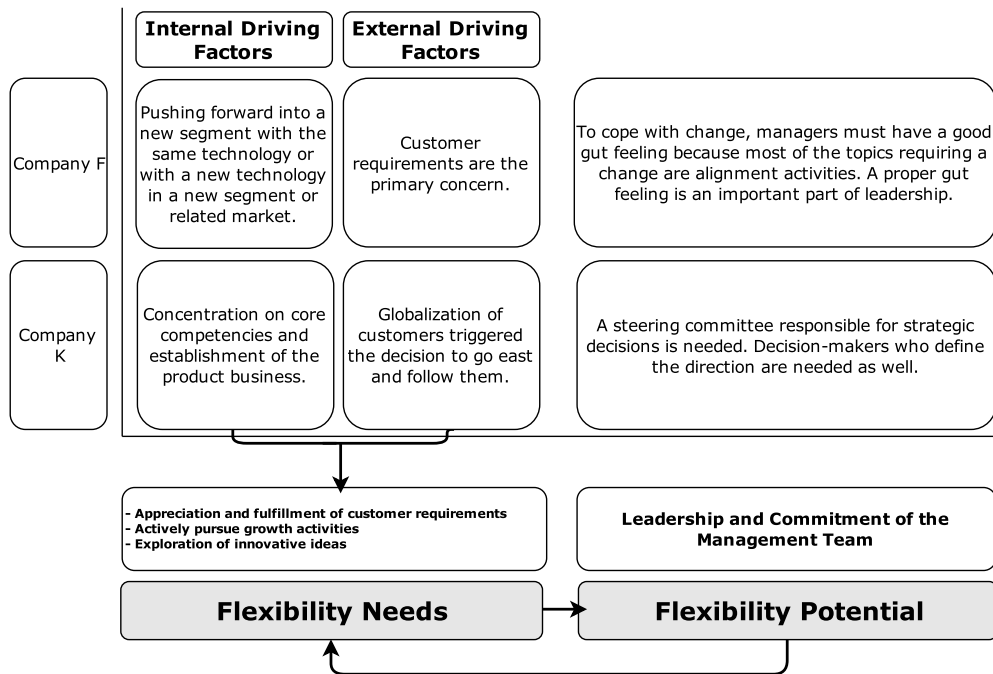


Figure 50: Flexibility potential of leadership and commitment of the management team (own illustration)

The biggest change for *Company K* was entering the *Ideas2market* product business. In this business, they seize innovative ideas, new technologies or identify patents that should be implemented in a marketable product. At the same time, *Company K* pursued the strategy of focusing on core competencies to strengthen the company in their most successful areas. In addition, customers also drive changes in the company's business model. For example, globalization of customers going east required the company to follow them. Thus, strategic decisions were needed to do

this and increase revenues. They discussed the possibility of supplying new business segments or offering new products to existing customers. In order to implement changes in the BM, Company K explained that it is essential to establish a steering committee within the company that is responsible for such strategic decisions. Furthermore, not everyone should be involved in such decisions in the same way because too large a group would hamper strategic decisions and their implementation. Thus, there should only be a few decision-makers who define the direction, discuss topics on a constructive basis and draw conclusions from this. Company K reported that the owner and founder still participates very actively in the company's operations. Due to his openness towards new directions, he still initiates many developments within the company.

Case vignette 28: Company K: The need for a steering committee to make strategic decisions

The leadership and commitment of the management team is necessary on the one hand to enhance the willingness to change within the organization and on the other hand to support the implementation of change initiatives. As the examples show, good leaders need to have the proper knowledge to make the right decisions as well as commit to these changes and drive their implementation. This in turn increases willingness to change in the company and makes it possible to implement a change initiative within a reasonable time frame.

7.4.4.5 Organizational Preparation

Companies need to prepare their organization for the future in order to be able to cope better with changing environmental conditions. Thus, established structures and processes have to be broken down; hierarchical structures and centralized responsibilities need to have a decentralized structure and spread over smaller teams. For example, Company H formed single teams responsible for groups of machines. Regular meetings and the transparency of KPIs should also raise the awareness of every employee and spread the know-how within the group (see case vignette 30). In Company G, the establishment of a product management group was intended to stimulate engagement with trends and developments as well as strengthen the relationship with the customer (see case vignette 29). Figure 51 summarizes how Company G and Company H have prepared their organizations to fulfill customer requirements, be innovative and pursue growth activities.

The eagerness to innovate and the innovation skills of individuals within the organization lead to new business opportunities in *Company G*, as was the case for the acoustics business area. This not only requires people who promote such topics, but also the freedom to do so and the resources, which have to be provided by the company. Besides the innovativeness of the company, the volatility of the customer market also drives changes on the market and requires flexibility. The present volatility complicates planning in terms of machines, employees and necessary resources.

Company G therefore attempts to establish closer relationships with customers and suppliers. In order to gain a better market overview and anticipate customer changes early on, Company G established a product management group within the organization. The reasons behind this were the lack of time for sales and R&D staff to visit conferences or trade fairs to seek out new technological developments, raw materials and so on. The establishment of a product management group helps Company G to search for new technological developments and be closer to the customer to counter-balance the volatility originating there.

Case vignette 29: Company G: Establishment of a product management group

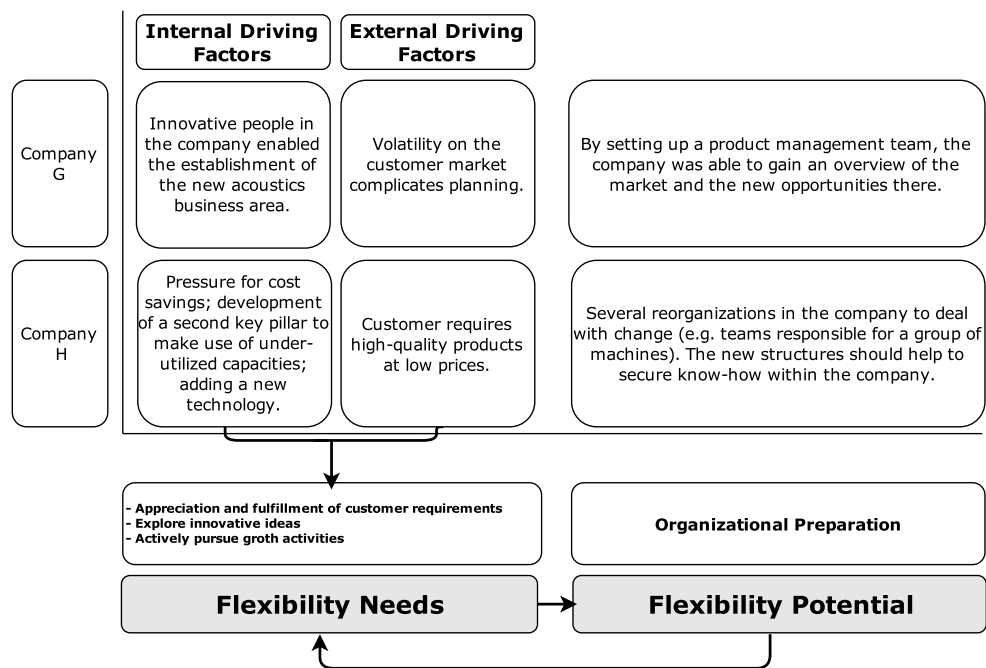


Figure 51: Flexibility potential of organizational preparation (own illustration)

The cost pressure in the pharmaceutical industry is very high. *Company H* also faces this challenge by reducing the number of employees to a minimum and placing a ban on hiring new staff. This led to changes in processes in order to fulfill the KPIs requested by the corporate group and the decision to start production at a volume of at least 2000 packages to ensure that the company is able to manufacture with high quality, but also at reasonable cost, as demanded by customers. In order to grow further and make use of underutilized capacities, *Company H* established a second key pillar by operating as a solution provider for third-party customers; also the addition of new technologies, for example the three-layer technology to manufacture tablets containing three different ingredients, is pursued as a growth activity. In order to deal with these challenges, *Company H* underwent several reorganization processes. In manufacturing, single teams are responsible for a group of

machines. In addition, KPIs are visualized for every single employee in the organization to increase awareness of their own performance (e.g. real time information on manufacturing output). In addition, the foreman met with the employees every morning in order to coordinate the day's activities and other departments, like quality management or packaging, also participated here. All of the structural and organizational measures should help to secure know-how within the company.

Case vignette 30: Company H: Several reorganizations due to cost pressure and additional growth opportunities

The right organizational conditions allow companies to grow further as well as recognizing and pursuing business opportunities much faster. Decentralized decision-making and establishing groups of people responsible for the processes and tasks in their task pane and, therefore, also for changes there are just two examples from the interviews as to how the organization can be improved. This also increases the speed of actions because decisions are decentralized to where the information and competencies are available.

Chapter 8

The Roles of the Business Ecosystem in Business Model Changeability

The previous chapter described a business model providing the flexibility to adapt according to changing needs. Here, several internal and external factors were identified that trigger changes in the BM, for example market trends or internal growth activities. One important factor identified was the customer and customer needs. This raises the question as to whether there are further participants in the business ecosystem of the company that trigger changes in the BM, or even play a specific role in the changeability of the business model. The goal is to answer the following RQ 2 (see section 1.2) in order to identify how the role of the business ecosystem is perceived in the changeability of the BM and especially how single elements and the BM as a whole are affected. Like in the previous chapter, the empirical results are presented with the help of paraphrased evidence in the interviews (see appendix A.7) and case vignettes. The summary and discussion of the results in order to answer RQ2 are provided in chapter 9.2.

Based on theoretical considerations for RQ 2 illustrated in section 6.2.2, specific questions were formulated in the interview guide (see appendix A.1) and supplemented by sub-questions emerging during the interview. In order to provide evidence on the development of the empirically grounded model, figure 52 points out the main steps in conducting the analysis. In order to analyze the data, pre-formulated codes were used to extract the information according to specific topics, such as relevant partners for the company and the relationship between these partners, which role the company plays in the network and the value chain, respectively, and how the business model of the company is influenced by the network in general. Data extraction and detailed analyses were first conducted for each single company and interview. Afterwards, emerging patterns were aggregated and described for the full sample. In order to

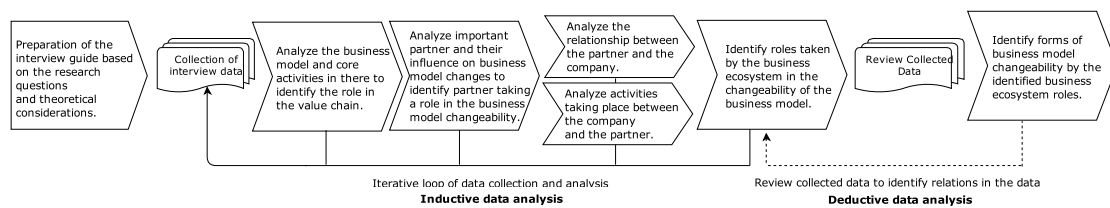


Figure 52: Procedure in RQ 2 analysis (own illustration)

develop the empirically grounded model, the business model was analyzed as a first step to identify the main activities and role of the company in the value chain. Then the information provided on important partners for the company was analyzed to identify those that influence the BM and are involved in change activities. Then, the relationships between important partners were analyzed. In parallel, the activities conducted together with the partner were analyzed to identify where they are working together in the BM. Based on this information, the roles of BE participants in BM changeability could be defined. All steps up to that point were inductive and explorative; data collection and data gathering were performed in an iterative loop. The following steps are more deductive and confirmatory because the original data were screened with the emerging categories developed in the previous steps. In this way, different forms of BM changeability should be identified due to the roles that BE participants can play. The result was an empirically grounded, conceptual model of BE roles assumed in different forms of BM changeability.

The business ecosystem roles identified are described detail in section 8.1. Section 8.2 explains the forms of BM changeability as a result of the roles assumed by BE participants.

8.1 Roles of the Business Ecosystem

As figure 53 shows, four different roles of the business ecosystem were identified in the changeability of the business model, while two of these roles – those of the “enabler” and “information provider” – have two separate special features, as described in the sections that follow. These roles comprise different participants in the BE (see figure 53) and have specific characteristics. In order to emphasize the characteristics of each role, they are described in terms of BE participants, the relationship between the participant and the company, the role of the company in the value chain as well as how the business model is influenced by each participant. In order to show the characteristics of every role, they are explained with the aid of case vignettes as summarized examples of interviews.

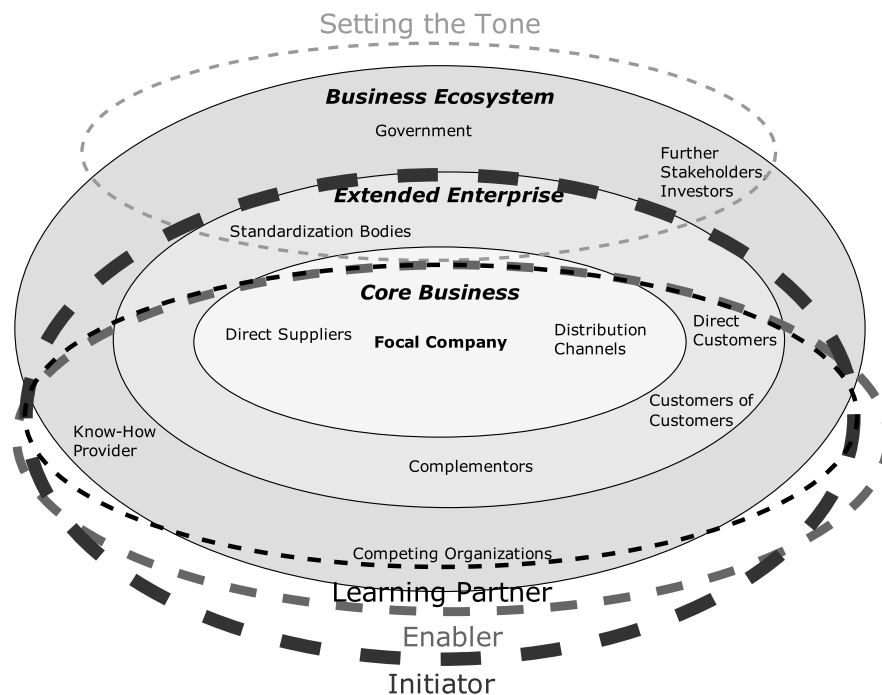


Figure 53: Roles identified in the business ecosystem (own illustration)

8.1.1 The Role of the “Enabler”

The *enabler* can take two forms: On the one hand, the “enabler” gives the company the option of embarking on a new path and thus, can provide additional business; on the other hand, the “enabler” can support the company in the implementation of new opportunities (e.g. by providing resources). It is sometimes difficult to separate these two forms of the “enabler” because the boundaries between stimulating new business opportunities and supporting the company in the realization of new opportunities are sometimes blurred. From a temporal perspective, the “enabler as promoter” is important in very early phases of a new development or business idea because this role implements the product or business together with the company. Partnerships here are very intensive and long-term, and there is no hierarchical superiority most of the time. In comparison, the “enabler as supporter” is considered when it comes to the realization and implementation of new business by providing resources and competencies in a way that is more time- and cost-efficient than the company can. Relationships are also cooperative and of a long-term nature, but some hierarchical superiority of the company over the “enabler as supporter” was identified. In order to highlight the differences, however, they are explained as two special features of the “enabler”: The “enabler as promoter” to pursue new opportunities and the “enabler as supporter” by providing resources and competencies in the implementation of new opportunities.

8.1.1.1 The “Enabler as Promoter”

Participants in the business ecosystem act as “promoters” if they are deeply involved in establishing new business opportunities for the company. These opportunities appear in the form of new products that can be offered or research projects that have market potential. In addition, the “promoter” makes new projects or business opportunities possible in the company by actively promoting them within the company. However, “promoters” are also partners who are actively sought out by the company to pursue and realize a business opportunity jointly. This happens before the opportunity is realized. For example, Company E explains that pilot projects to establish new topics are launched with partners like universities or competitors. Company K actively seeks out partners when new product ideas appear and important competencies are lacking. The relationship with these partners is mainly of a *cooperative* nature; they are close and intensive. The position of the company in the business ecosystem and the value chain varies. For example, Company D can occupy several roles and steps in the value chain, depending on the specific project situation. From the relationship with the “enabler as promoter”, the company is able to *extend* the business model by expanding the product portfolio, competencies and resources or adding new business to the core business. Case vignettes 32 to 33 illustrate examples of companies working together with “enablers” acting as “promoters”; table 33 summarizes the key facts from these three case vignettes.

Company E is a huge corporate group consisting of different business sectors. The energy sector was considered in more detail. Within this sector, different business models are implemented depending on the product portfolio and the customer group. The business sectors span classic product business, where products like turbines or switchgears are produced; project business, where turnkey facilities are built together with subcontractors and partners; and the third business sector – service business. There may also be a mixture of these three business models. Company E has very close relationships to partners in R&D, where basic research is conducted together in the form of pilot projects in order to establish completely new topics (e.g. smart metering or smart grids). Partners in such projects are universities, competitors and other companies dealing with the topic; relationships are very intensive during the project. Topics determined together include the appearance of the technology, standardizations, basic legal conditions required, and so on. However, their paths separate when it comes to launching the product on the market, at least among competitors. If the company needs partners for implementation, they look for a general partner. Company E designates this kind of partnership as *partnerships of convenience* because the only reason for their existence is the absence of competencies for realization on the market. There was also mention of partners offering a complementing competence needed for the market launch.

Case vignette 31: Company E: Description of the “enabler as promoter” role

The core business of *Company K* is to supply turnkey production systems to different industries (e.g. the automotive industry, electronics industry, consumer goods industry or medical technology and health care sectors). *Company K* acts as a general contractor and works with subsidiaries as well as technology and research partners to realize projects. Besides their core business as general contractor for production systems, *Company K* developed the *Idea2market* business area, where product ideas, patents or technologies are seized and made into a marketable product. For *Company K*, this was the step towards product business, which differs from their core business. Organizationally, the *Idea2market* area is separate, but uses know-how and resources from the core business. Whether the product idea is realized depends on its general fit to the business model as well as the potential to take a leading role and not interfere with existing customers. *Company K* does not always have all the competencies and resources available to provide these products, so they form external partnerships (e.g. with universities) to make this possible. The company thus depends on external partners with experience in the respective market, the research field or product area. In order to provide the product, the company cooperates with these external partners. *Company K* describes the relationship to these partners as very intensive and of a long-term nature; cooperation arrangements that do not work are not pursued further. In the meantime, *Company K* has already established itself in the *Idea2market* area. Know-how or cooperation partners actively bring new possibilities to the company's attention, and *Company K* only has to decide whether or not to pursue them.

Case vignette 32: *Company K*: Description of the “enabler as promoter” role

The business area of *Company D* under consideration in this study establishes and provides intelligent transportation systems in the form of toll collection systems. As *Company D* operates in project business, every project is very unique in terms of its legal situation and environmental conditions. The role of *Company D* differs in every project; sometimes the company operates as leader of a consortium spanning the entire value chain, and sometimes it only covers a small part or step in the project. To extend the product portfolio and fill any gaps identified, *Company D* needs to think about how to close the gap, a classic make-or-buy decision. In order to grow and in view of market considerations, *Company D* embarked on a targeted search for mergers and acquisitions that also have technological implications. This enables *Company D* to provide additional value to their customers.

Case vignette 33: *Company D*: Description of the “enabler as promoter” role

	Company E	Company K	Company D
Business ecosystem participant	Universities, competitors, additional companies	Technology/Research partner	Complementor
Position in the value chain	Layer Player (product business; service)/Orchestrator (as general contractor)	Orchestrator (as general contractor)/Integrator (<i>Idea2market</i>)	Layer Player (specific step in the value chain)/Orchestrator (leader of consortium)

	Company E	Company K	Company D
Relationship	Cooperation, co-opetition – close and intensive	Cooperation – very intensive, long-term	Hierarchical – corporate group and subsidiary
Impact on business model/business model elements	Business model extension by establishing new topics that should be launched on the market.	Extending value creation through external technologies, resources and competencies.	Extending the value proposition by enlarging the product portfolio through mergers and acquisitions.

Table 33: Companies E, K and D: Characteristics of the “enabler as promoter”

8.1.1.2 The “Enabler as Supporter”

The *enabler as supporter* provides the company with competencies and resources to implement and execute the business model. The business ecosystem and its respective participants take on this role mainly *after* the company has decided to pursue and implement a new business opportunity. They are *actively* sought out by the company for implementation of the new business opportunity in order to provide any missing competencies and resources that are not the core competency of the company and can be provided by the “supporter” much cheaper and faster. For example, Company M needs additional competencies in order to execute the step towards being an integrator as solution provider. These competencies should be provided externally by consultants. Relationships with these companies are mainly *cooperative* and *subcontracting* because know-how is obtained through contracts between participants. Here, too, the position of the companies in the business ecosystem and the value chain, respectively, do vary. For example, Company I as partner focuses on the development and production of medical and optical technologies. The “enabler as supporter” helps to complement the BM by providing resources in value creation. Furthermore, the business model is scalable for the realization of large projects exceeding the capacities and resources owned by the company; partners should compensate these bottlenecks. Case vignettes 34 to 36 are examples where companies are affected by “enabler as supporters”; table 34 summarizes the key facts of these three case vignettes.

Company I is a service provider who develops and manufactures components for medical and optical technologies. They do not offer products on their own; instead, they develop and manufacture components for their customers only. Company I established a network of *know-how providers* like institutes and universities, but also of suppliers, customers and other companies to support them. For their technologies, Company I implemented a *technology advisory board*, where partners act as consultants for the company and support them in the realization of projects. Partnerships are mainly established for electronic development work and for optical or mechanical developments. Company I compared the relationship with the technology advisory board and all know-how providers to buyer-supplier relationships, but with mutual support for the company and know-how providers.

For Company I, these partnerships are very important in staying competitive because it is not possible to develop all the required know-how alone. With the help of these partners, results are achieved much more quickly.

Case vignette 34: Company I: Description of the “enabler as supporter” role

Company M provides information and communication solutions in safety-critical areas, so-called *control center solutions*, consisting of hardware and software. They offer these solutions for civil and military aviation security, air defense and for public transport (e.g. police, trains). The focus of the interview was civil aviation security because the interview partner is product manager in this area and responsible for business development. Company M is actually in the process of changing the business model by moving forward and taking on the role of integrator, supplying directly to the end customer. Formerly, their customers were integrators, which are huge telecommunication companies, for example, delivering the network infrastructure and configuring the product supplied by Company M according to the air traffic control specification. Taking the step towards becoming an integrator changes the product of the company and also bears higher risks. At the moment, Company M lacks know-how because they do not have experience in this business. Thus, the company is actively seeking partners to gain access to the required know-how to support them during projects. These partners may be individuals, but also entire companies with the appropriate know-how. A subsidiary of the company already provides this know-how in some projects. Company M is still considering how best to obtain this lacking know-how, and the possibility of developing it in-house is also under discussion.

Case vignette 35: Company M: Description of the “enabler as supporter” role

The business of *Company K* was already outlined in case vignette 32, which also explained the concept of technology and research partners as “promoters”. In their project business as supplier of turnkey production systems, Company K depends on partners supporting them in the realization of the project. They reported that some customer projects are so huge that the company is not able to execute the project alone. In such cases, Company K has two choices: Either to abandon the project or execute it together with a competitor. Company K decided to execute the project together with local competitors because none of them were able to conduct the project alone. The main responsibility in such projects remains with Company K. In this way, cooperation with competitors is used to balance variations in project sizes. The relationship to these partners is co-opetitive – in some projects they compete against each other and the relationship is competitive; in other projects they quote jointly, which makes them cooperation partners.

Case vignette 36: Company K: Description of the “enabler as supporter” role

	Company I	Company M	Company K
Business ecosystem participant	Network of know-how providers (e.g. universities, companies, institutes)	Know-how provider (e.g. consultants, subsidiary, individual)	Competitor
Position in the value chain	Layer Player (service provider in development and manufacturing)	Layer Player (supply product to integrator)/Integrator (forward integration to work as solution provider for end-customers)	Orchestrator (as general contractor)/Integrator (Ideas2market)
Relationship	Cooperation – mutually supportive	Subcontractor/Cooperation – buying know-how externally	Co-opetition
Impact on business model/business model elements	Complementing value creation in the business model with external know-how.	Complementing value creation in the business model with external know-how.	Scale the business model with the help of local partners to realize a project.

Table 34: Companies I, M and K: Characteristics of the “enabler as supporter”

8.1.2 The Role of “Setting the Tone”

The role identified as *setting the tone* is very different to the “enabler” described previously and its two forms. In the business ecosystem, participants like the government, standardization bodies, but also the corporate group take decisions and pass laws, regulations, or quality standards that force the company to change the product, processes or quality criteria. Adapting to the new environmental situation is an essential precondition to participating in the business further; not adapting is not an option. Company O is in the pharmaceutical industry, where strict regulations and quality criteria are dictated by the government and standard bodies. As these differ from one country to the next, the company needs to satisfy these regulations as a pre-condition for their business. This enforcement demanded by the role of “setting the tone” is also represented in the relationship between the BE participant and the company: mainly hierarchical, where companies and organizations assuming this role have more power than the company itself. For example, the government passing laws for the pharmaceutical industry is more powerful than Company O operating as a manufacturer and distributor of pharmaceutical products because Company O has to comply with these laws. However, the present relationships are also co-existent because they are not of an economic nature. The positions in the value chain incorporated by companies affected by this role are again different. For example, Company H is an expert in manufacturing small amounts of pharmaceutical products and dietary supplements for the corporate group and third-party customers. Case vignettes 37 and 38 are two examples of companies that are highly influenced by the role of “setting the tone”; table 35 summarizes the key facts of these case vignettes.

Company H works as a service provider in the pharmaceutical industry by focusing on the production of small volumes of pharmaceutical and dietary supplement products. As an extended workbench of the corporate group, the main task of *Company H* is production according to target plan forecasts of the corporate group. Besides this, they work as solution provider for third-party customers, where additional services like documentation are also provided in addition to purely manufacturing. The main customer of *Company H*, with a share of 70%, is still the corporate group. However, the corporate group is not only a customer because it also defines strategic decisions and guidelines that *Company H* has to follow, despite having its own strategy and plans. *Company H* tries to adjust to these changing requirements. For example, *Company H* described a situation where the corporate group decided to change the prioritization of customers. Prior to this, customers for pharmaceutical products had high priority. By switching the focus of the company towards manufacturing for consumer health care business, customers for dietary supplement products have higher priority. Nevertheless, *Company H* always profited from the positive outcome of decisions made by the corporate group. As *Company H* is a subsidiary, the relationship to the corporate group is clearly defined as hierarchical, with more power remaining with the corporate group.

Case vignette 37: *Company H*: Description of the “setting the tone” role

The core business of *Company O* is the manufacture and sale of pharmaceutical and medical products for critically ill patients. In the pharmaceutical industry, the government imposes strict regulations and laws that the company must observe. *Company O* reports on the example of the unbroken chain of traceability for pharmaceutical products in the future, which must be ensured and documented from manufacturing to disposal for every single patient. These regulations and laws also forced *Company O* to change its business model. In order to influence these regulations, *Company O* participates in different committees in order to receive information on laws and regulations in advance, is involved in discussions and also issues a statement in advance. Thus, the company is able to find out a certain period in advance what changes will appear in the near future and has time to prepare for this accordingly.

Case vignette 38: *Company O*: Description of the “setting the tone” role

	Company H	Company O
Business ecosystem participant	Corporate Group	Government
Position in the value chain	Layer Player (manufacturing and packaging of pharmaceutical products and dietary supplements)	Orchestrator (partners in distribution/logistics)/Integrator (development, manufacturing and sales of pharmaceutical products)
Relationship	Hierarchical – Company H has to obey the decisions of the corporate group	Hierarchical – Company O has to obey
Impact on business model/business model elements	Adjusting the business model according to decisions made by the corporate group.	Adjusting the business model according to reforms and regulations imposed by the government.

Table 35: Companies H and O: Characteristics of the role of “setting the tone”

8.1.3 The Role of the “Initiator”

The role of *initiator* is embodied by many participants in the business ecosystem. An “initiator” leads a change in the company by changing itself or sends impulses and information that result in rethinking of the company’s business model and reinforce it so that the company remains competitive. The “initiator” is also present in two different features: The *initiator as direction changer* and the *initiator as information provider*. These two roles and their characteristics are explained in more detail in the following sections.

8.1.3.1 The “Initiator as Direction Changer”

Participants in the business ecosystem acting as *direction changers* are mainly customers. Customers change the direction of the company by relocating their own focus and changing needs or inquiries that lead to new orders, accompanied by a change in the company’s direction. Company C, for example, reported that a customer requested the development of a technology that was completely new to them. But this customer inquiry changed the direction of the company as the technology established a new research focus at Company C. Customers are also drivers of changes in the BM of Company M as they force the company to change the product towards the use of more standard IT in order to save costs. For Company F, a merger by the two largest competitors led to a change of strategy because the merger will bring huge challenges for the companies involved, and Company F plans to use this to their advantage. As the “direction changer” acts as the driver of those changes, the company concerned plays a *reactive* role by adapting to those changes, which has several implications for the BM. By adding the new research focus, Company C was able to extend their business model. In comparison, Company F reinforced its own business model in order to gain an advantage from the challenge its competitors were facing. The relationship between the company and the “direction changer” is mainly *cooperative*, as described by Company C, but also *competitive*,

as in the case of Company F. In addition the position of the company in the network and the value chain, respectively, varies, as already explained in the roles already described. Case vignettes 39 to 41 are examples where an “initiator” acting as “direction changer” causes changes in the BM; table 36 summarizes the key facts of these case vignettes.

Company C develops and supplies control systems for furniture in the office and home sector. Customers of *Company C* are furniture manufacturers and there are differences between these two business sectors. In the office sector, the company delivers standard products, meaning that nearly all customers have the same product. This differs from the home sector, where customers are consumer brands and the products have to be individual solutions for them. *Company C* maintains a very intensive and strong relationship with their customers because a close relationship with the customer is very important for this company. The incident reported by *Company C*, where a customer acted as a “direction changer”, was in the home sector where a customer requested the development of new technology for a product – a remote control device with LCD display, to be more specific. This was a completely new technology for *Company C* because they did not have such technology on the market up to that point. This customer project resulted in this technology being established as a new research focus of the company. Such intensive cooperation leads to technology projects having an influence on the business models and vice versa, as *Company C* explained.

Case vignette 39: *Company C*: Description of the “initiator as direction changer” role

Company F operates as a supplier in the semiconductor industry, more precisely as a solution provider for a specific product in the cleaning sector. Changes in the competitive landscape influence the company and force them to react. As an example, *Company F* reported the merger between the two largest competitors in this branch. In order to react to these changes, *Company F* is considering possibilities to gain an advantage from this situation. *Company F* supposes that this merger will be a huge challenge for these two companies and will paralyze them both for at least a year. As these two companies are from America and Japan, they have completely different cultures that need to be merged; in addition, they have to merge overlapping technologies and so on, which presents a huge challenge. *Company F* is trying to exploit this situation by changing the strategic direction and gain a competitive advantage from the challenge the two competitors are facing.

Case vignette 40: *Company F*: Description of the “initiator as direction changer” role

As already explained in case vignette 35, *Company M* offers information and communication systems for safety-critical tasks. The specific systems for this safety-critical task consist of software and hardware components that are mainly developed by *Company M* themselves. This in-house development is required because the software and hardware needs to comply with the safety-critical

standards necessary in the branch and also be certified before application. However, this means higher costs for the customers. As customers become more price-sensitive, requirements are moving in the direction of using more standard IT – commercial, off-the-shelf software – in the products. The customer is not aware of consequences as a result of these changes because every change or update needs to be certified and also involves high costs and a long period of approval. Up to now, standard software was mainly applied in monitoring and configuration of the system in use, but not in the product itself. A change towards the use of standard IT requires an adjustment to the entire business model; this will be pursued in the future.

Case vignette 41: Company M: Description of the “initiator as direction changer” role

	Company C	Company F	Company M
Business ecosystem participant	Customers	Competitor	Customers
Position in the value chain	Layer Player (development and supply of control systems)	Layer Player (supplier of a product in the semiconductor industry for the cleaning sector)	Layer Player (supply product to integrator) / Integrator (moving forward to work as a solution provider for end customers)
Relationship	Cooperation – strong and intensive	Competitive	Cooperation – close and intensive
Impact on business model/business model elements	Extending the business model by adding a new research focus.	Reinforce the business model by changing the strategic direction to exploit the merger challenge of two large competitors.	Adjusting the business model towards the decision to use more standard IT.

Table 36: Companies C, F and M: Characteristics of the “initiator as direction changer”

8.1.3.2 The “Initiator as Information Provider”

The *information provider* provides information on market trends, regulations and standards in the future as well as technological developments or potential customer needs that may present new business opportunities for the company. The role as “information provider” is embodied by branch experts, clusters, customers, suppliers and other participants in the ecosystem. The role of “information provider” is a special role because information is provided by other roles as well in order to establish a new business or learn from one another, to name but a few examples. Nevertheless, the “information provider” incorporates a large group of BE participants and the companies interviewed highlighted the importance of this role. Company P explains that branch experts and futurologists provide information on developments in branches where they will operate in the future. BE participants acting as “information providers” are very different, as are the relationships between the company and these partners, spanning *cooperations, subcontracting*, but also hierarchical and co-existing relationships. The same diversity is reflected in the position the companies hold within the network. For example,

Company R provides electronic components, representing a specific step in the value chain, but also acts as an integrator and solution provider in their business of electrical installations. The “information provider” does not lead quickly to a change in the business model, but at least prompts the company to think about it. Company R reported that information provided by suppliers may lead them to discuss and consider the business model and may also initiate a change. In doing so, the company is reinforcing its own business model on the basis of the information gathered. Case vignettes 43 and 42 are examples of companies affected by “initiators as information providers”; table 37 summarizes the key facts of these two case vignettes.

The businesses in which *Company R* operates are very diverse and range from drive engineering, system technology, electronic systems, facility engineering, to service and maintenance. All of these businesses pursue a completely different business model without much synergy. Company R is a very traditional company, where most of the changes can be observed well in advance and network partners play only a minor role in the business. However, this view is slowly changing in the company. Nevertheless, Company R has partners with whom they work closely. In the drive engineering business area, the company has long-term, contractual business relationships with suppliers, which they refer to as the “Stammhaus”. Regular quarterly meetings with these suppliers provide information on the market and future developments. Within the company, this information is exchanged between business unit managers and technical managers of the other business areas. During the internal quarterly meetings, information is exchanged on technology trends. Although the information might not be relevant for the drive engineering business, Company R emphasized the importance of this information exchange because it could have an impact on one of the other business sectors, resulting in some consideration and discussion of the business model and also changing it if a new opportunity is identified.

Case vignette 42: Company R: Description of the “initiator as information provider” role

The core business of *Company P* is operating as a solution provider of automatic warehouse logistic systems, serving customers in several branches like cosmetics, food, pharmaceuticals or fashion. As Company P understands itself as a partner supporting the entire supply chain in these branches, it is essential to understand how the markets and every single branch will develop in the future. Thus, the company meets once a year with branch experts and futurologists to discuss possible developments. This helps Company P to identify trends in the respective branches and take proactive steps to change the business model to deal with these developments. Company P reported that only timely identification of changes, requirements or trends provides an opportunity for proactive actions. If changes are not identified early on, the only possibility for the company is to react to these changes.

Case vignette 43: Company P: Description of the “initiator as information provider” role

	Company R	Company P
Business ecosystem participant	Suppliers	Futurologists; branch experts
Position in the value chain	Layer Player (electronic systems) / Orchestrator (drive engineering) / Integrator (system technology, facilities engineering, service and maintenance)	Orchestrator (turnkey technology solutions for automatic warehouse logistics in several branches)/Layer-Player (key technologies are developed and manufactured in-house)
Relationship	Sub-contractor	Co-existence
Impact on business model/business model elements	Consider and also reinforce the business model on the basis of information exchanged with close suppliers and between the business units.	Reinforcement of the business model by early identification of trends.

Table 37: Companies R and P: Characteristics of the “initiator as information provider”

8.1.4 The Role of the “Learning Partner”

A further role played by BE participants is that of a *learning partner*. The “learning partner” is represented by research institutions, companies in clusters, but also customers providing companies with best practices or solutions to problems that other branches have to cope with, but may be relevant to the company’s own branch as well. The “learning partner” is distinguished from the “information provider” by the fact that the “learning partner” not only provides information on future developments in the branch, but also gains insights into best practices in order to improve internal company tasks and processes; or projects are started together with the “learning partner” in order to work on the same problems. Thus, Company F benchmarks with competitors and companies in similar industries to identify best practices. The relationships between the company and learning partners, in the case of customers, are *cooperative*, but also *co-existent or co-competitive* if “learning partners” are competitors; on the other hand there may be no business relationship at all. Again, the position companies may take in the network or value chain varies, as already described in other roles. The “learning partners” provide new insights that help to reinforce the new business model. Company H reinforces the business model by learning from third-party customers how to operate on the market in a different and better way. Company D extends the existing business model with new business emerging from the specific growth program launched together with partners. “Learning partners” have a specific characteristic as this role can include other roles as well. For example, Company H learns from their customers how to proceed in a different and better way; at the same time, the customers play the role of “enabler” for new business opportunities. For Company F, competitors are important in benchmarking, but also act as “initiator” for new directions, as case vignette 40 explains. Examples of BE roles as “learning partner” are described in case vignettes 44, 45 and 46; table 38 summarizes the key facts of these three case vignettes.

The business of *Company H* was already described in case vignette 37. Besides their main business as extended workbench for the corporate group, *Company H* has third-party customers where the company operates as solution provider by offering documentation or supporting submissions in different countries. The initiative for starting the business was to utilize unused capacities and develop a second key pillar within the organization. However, these customers attained significant importance for *Company H*. Third-party customers are different compared to the corporate group because they work and act in a different way to the corporate group. To a certain degree, they also have different expectations to the corporate group, for example by participating in projects in a different way, and different behavior when working together on daily business. Third-party customers are more open, but also more demanding. If a customer is very demanding, the effort invested by the company needs to be weighted to the importance of the customer for the company. *Company H* therefore prioritizes the effort according to customer importance and how much the customer contributes towards learning and improvement of the company's own business. If the customer acts as Enabler, they also provide new business opportunities for the company through specific ideas or problems that have to be solved. The relationship between the company and their customers is very intensive and based on trust. In addition to customers, *Company H* also learns and improves by being part of networks and societies. There is no competition available in these networks; additional information is gained, best practices are exchanged or legal topics discussed. Attempts are also made to establish this kind of networking with customers in order to gain further information that is not easily obtained normally.

Case vignette 44: *Company H*: Description of a "learning partner" role

The competitors playing the role of Initiators by changing the direction was described in case vignette 40. However, competitors may also take on the role of "learning partners", together with companies in similar industries, where *Company F* tries to learn from them through benchmarking. This benchmarking takes place in an exchange of information, where similar topics and problems as well as potential areas of cooperation and symbioses are identified. *Company F* actively seeks out such cooperation because they see benchmarking as a good way to learn and improve. Thus, similar industries and also industries not related to *Company F* are investigated regarding specific problems, and networking is pursued in this field.

Case vignette 45: *Company F*: Description of a "learning partner" role

The business of *Company D* as well as the importance of pursuing steady growth for the company were already explained in case vignette 33. To meet these requirements, *Company D* launched a growth program together with research institutions in order to take a targeted look at business models or business segments that could be of interest to them. The business fields that *Company D* is looking for are normally far removed from the company's traditional business. *Company D*

selectively picks out branches or topics where they believe that these topics will be relevant in the future and some potential could be realized in an international comparison in terms of growth and taking a leading role. This growth program has already established a successful subsidiary offering smart meters.

Case vignette 46: Company D: Description of a “learning partner” role

	Company H	Company F	Company D
Business ecosystem participant	Third-party customers	Competitors/Similar industries	Research institutions
Position in the value chain	Layer Player (manufacturing and packaging of pharmaceutical products and dietary supplements)	Layer Player (supplier of a product in the semiconductor industry for the cleaning sector)	Layer Player (specific step in the value chain)/Orchestrator (leader of consortium)
Relationship	Cooperative – intensive, based on trust	Co-opetition (competitors); Co-existence (similar industries)	Cooperation
Impact on business model/business model elements	Reinforce the business model by learning how to act in another or better way to improve and extend business.	Reinforce the business model through benchmarking with competitors and similar industries.	Extending the business model by taking a look at businesses far removed from the traditional business.

Table 38: Companies H, F and D: Characteristics of “learning partners”

8.2 Implications of Roles on Business Model Changeability

All BE roles described have an impact on the business model, as already explained in the case vignettes of the previous sections. The results are different forms of business model changeability. In total, five different forms of changes in the business model were identified – BM extension, BM scalability, BM complementing, BM adjustment and BM reinforcement. The forms of business model changeability identified, provoked by the BE roles identified, and their influence on the business model and single elements are described in the following subsections.

8.2.1 Business Model Extension

By *extending the business model*, the company realizes additional business opportunities in the context of the current business model or extends the current business model by adding a new opportunity. The characteristics of BM extension are broadening the current business by offering new products with the help of a partner, enhancing existing resources and competencies by means of external resources and competencies or by adding completely new business as a result of potentials identified in the new opportunity. Company K started a new business area

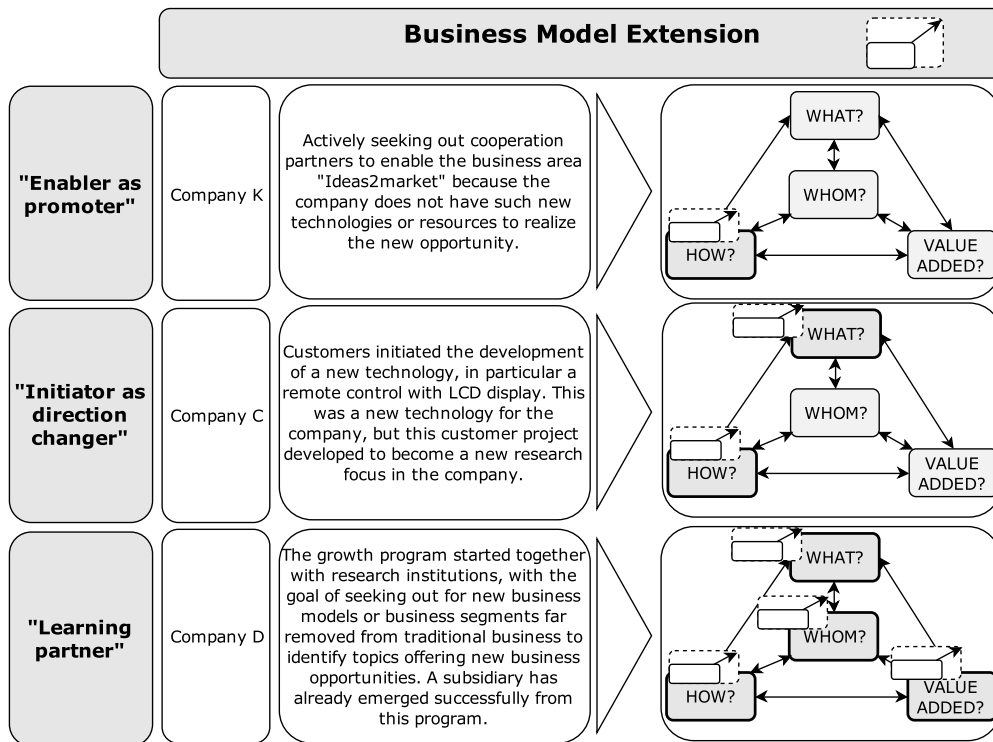


Figure 54: Business model change in the form of business model extension (own illustration)

and is actively seeking out cooperation partners with whom to realize the new business. The partners extend value creation with technologies and resources required for this new business area. For Company C, the customer as “direction changer” initiated extension of the BM by asking for the development of an LCD display (value proposition), which was a new technology for the company up to that point. This permanently extended the business model by adding the technology as a new research focus (value proposition and value creation). Company D started a growth program in cooperation with research institutions, where they actively seek out growth potentials in industries and branches not related to the company’s traditional business. One result of this growth program was the establishment of a subsidiary offering smart meters. The development of this new business model can be seen as an extension of the entire business of Company D. Figure 54 explains the realization of the business model extension in Company K, Company C and Company D and shows which BE role provokes this extension. The symbols in the figure beside the BM elements denote the elements affected by changes provoked by BE participants. It becomes visible that the three roles of “enabler as promoter”, “initiator as direction changer” and “learning partner” induce extensions in the business model, namely value creation, value proposition or the entire business model.

8.2.2 Business Model Scalability

Business model *scalability* is triggered by the role of “enabler as supporter” providing the means with which to realize projects. In this way, the company uses external manufacturing resources or seeks out other companies in order to attain a size that is able to carry out a project. Company I explains that the scalability of resources in order to produce customer products provides flexibility and can be used depending on the company’s own degree of capacity utilization. This is important for the implementation of customer projects that exceed the manufacturing capacities of Company I. Another way to scale the business model was reported by Company K. In the realization of huge customer projects for special production systems, the company cooperates with competitors in order to tender for and execute the project. This provides the necessary resources and capabilities that the company alone is not able to provide. Business model scalability is a very operational view of business model changeability because the business model is “stretched” for a certain amount of time during the project and returns to its original state again afterwards. Nevertheless, scalability has an impact on the business model and especially on value creation. Thus, it can be considered as a business model change to a certain extent. Figure 55 shows how Company I and Company K scaled their BM with the help of the “enabler as supporter”. The symbols in the figure beside the BM elements denote the elements affected through changes.

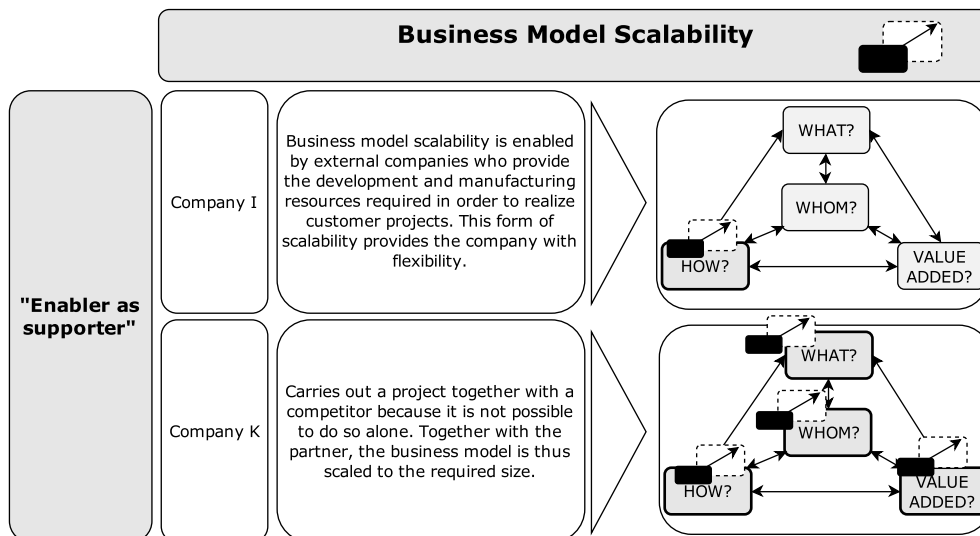


Figure 55: Business model change in the form of business model scalability (own illustration)

8.2.3 Business Model Complementing

The business model of the company is *complemented* by the “enabler as supporter” by providing know-how and competencies currently lacking in the company for implementation and execution of the business model (see figure 56). This offers the company the opportunity to concentrate on core competencies and saves costs and time because the company does not need to develop competencies by itself. Thus, it is not surprising that the value creation element is mainly complemented, but also the customer element as the example of Company M shows. Company M decided to move forward and change to become an integrator. In order to realize this step, the company requires specific know-how that is not available at the moment. External consultants, but also subsidiaries of the company, should complement the business with these features. In comparison, Company O expands the business and supplies their products to countries abroad. In order to cope with legal situations, which are different for pharmaceutical products in every country, Company O either establishes its own subsidiary if business is large enough, or seeks out a local distributor who already knows the legal situation in the country. This distributor provides the missing know-how (value creation) on the country’s legal conditions and also forms an interface towards customers. Figure 56 shows how Company M and Company O complemented their BM with the help of the “enabler as supporter”. The symbols in the figure beside the BM elements denote the elements affected by changes.

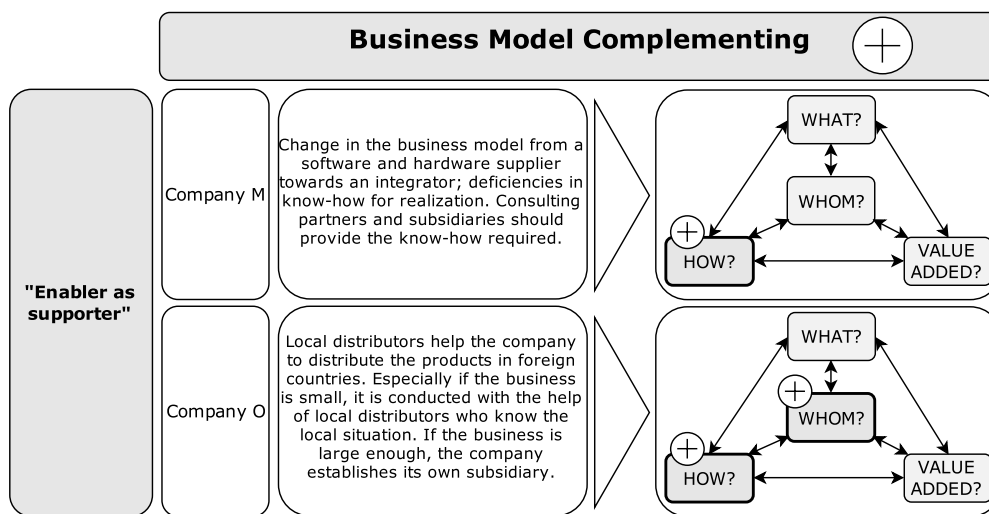


Figure 56: Business model change in the form of business model complementing (own illustration)

8.2.4 Business Model Adjustment

When new laws, regulations or guidelines are issued, *business model adjustments* are performed by “setting the tone” or the “initiator as direction changer” (see figure 57). These adjustments can affect the whole company as a result of new regulations or laws, or the value creation as a result of changes in the supplier base, for example. In Company H, the corporate group provokes an adjustment to the business model because decisions made by the corporate group have to be implemented by the subsidiary. For Company L, technology partners provoke an adjustment of the business model (value creation) because the technology provided constitutes a core competence for Company L; thus, a dependency is created. When Company L changes its technology partner, changes in the BM of the company are the result. In both examples, changes in the environment of the company triggered adjustments of the BM. The symbols in the figure beside the BM elements denote the elements affected by adjustments.

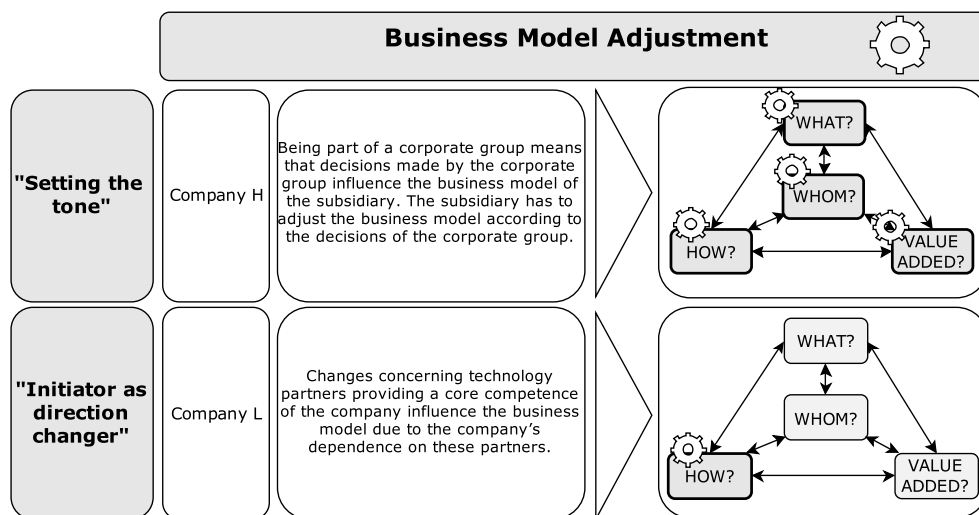


Figure 57: Business model change in the form of business model adjustment (own illustration)

8.2.5 Business Model Reinforcement

The constant necessity to improve in order to remain successful motivates companies to exchange information and to learn from and with external partners, with the goal of *reinforcing* the existing business model. The roles of “initiator as direction changer”, “initiator as information provider” and “learning partner” were identified as roles initiating reinforcement of the BM. Reinforcements can concern the value proposition, as in the example of Company M, but most of the time the entire BM is reinforced. Company R, for example, has very close cooperation with a supplier with whom information is exchanged regularly. This information is used inside the company and exchanged between business segments to consider and discuss the

business model, which may also result in changes. Company M works together with customers and other industry partners to develop the future market for civil aviation security in 2030 and investigate how these standards can be achieved together. As a consequence, Company M has to develop their products towards these standards and align them with other products (value proposition). For Company F, benchmarking with competitors and companies in similar industries constitutes an important source of new information and best practices. Furthermore, symbioses of possibilities for working together should be found. Figure 58 provides information on Company M, Company R and Company F and on how BE participants have reinforced their business models. The symbols in the figure beside the BM elements denote the elements affected by adjustments.

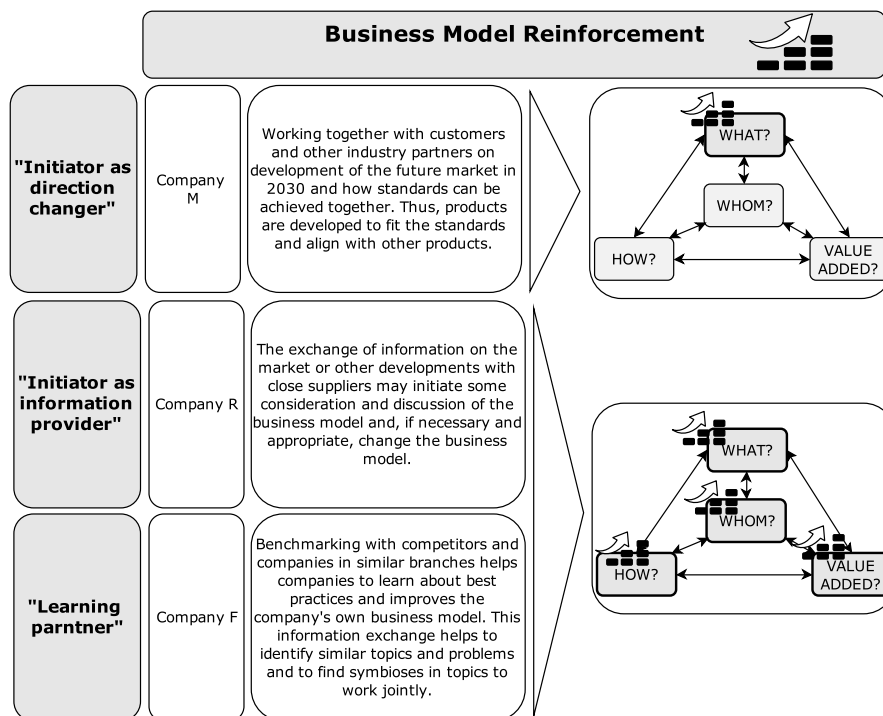


Figure 58: Business model change in the form of business model reinforcement (own illustration)

Part IV

Discussion of Results and Concluding Remarks

Chapter 9

Discussion of Results and Recommendations for Academia and Industry

The previous two chapters presented the analysis process for the empirical data and the results thereof. As the research followed an inductive, qualitative research design, the results are more descriptive, explaining how companies operating in the high-technology environment can prepare their BM in order to raise their flexibility in terms of internal and external changes as well as which roles the BE can play in the changeability of the BM. This research was not intended to define a prescriptive concept of a BM leading to flexibility, nor to define the BE roles necessary for BM changeability.

The following sections answer the research questions, discuss the findings and compare them with the existing literature. In addition, recommendations are derived to emphasize implications for academia and industry.

9.1 Research Question 1 – A Business Model providing Flexibility

The goal of RQ 1 was to identify how a business model has to be designed so as to provide flexibility according to internal and external factors driving changes. The empirical results of section 7 are used to answer research question 1 as well as the sub-questions formulated:

RQ 1: How should the business model, with its corresponding elements, be designed so as to provide the flexibility required to adapt to changing needs?

- RQ 1.1: Which elements constitute the core elements of the business model?
- RQ 1.2: What characterizes elements that are flexible to respond to changes?
- RQ 1.3: How does change in one element influence the other elements in the business model and subsequently result in a completely different business model?

The subsequent sections answer the sub-research questions formulated and summarize the results for RQ 1.

9.1.1 The Core Elements of the Business Model

Research question 1.1 had the goal of identifying which elements of the BM are seen as core elements of companies operating in high-technology branches:

RQ 1.1: Which elements constitute the core elements of the business model?

In section 7.1, four different BM elements were described, which were reported as being the core elements by the companies interviewed (see figure 37):

- *The Customer*, representing the target group of the company's offerings and the channels through which this target group is reached.
- *The Value Proposition*, explaining the "what" factor in the business model, consisting of the products offered, services and additional values in order to fulfill the needs of the target group.
- *Value Creation* describes *how* the value is generated for the customers in terms of processes, necessary resources, competencies and external partners needed for this purpose.
- *Value Capture* determines the *added value* in the form of the revenues generated from the value proposition and the costs incurred as a result of value creation.

The core business model elements identified coincide with the findings in the literature (see section 4.2), where these four elements were identified on the basis of several definitions examined. Additionally, the empirical results show that business models can also be distinguished

according to the business the company is involved in, whether it is project business, product business, or whether the company is operating as a service provider. In this research context, this became especially visible when describing the value proposition. From the interviews, it was also noticeable that companies see the customer in the center of the BM, targeted by all activities within the company. Positioning the customer in the center of the BM is also discussed in the literature: Gassmann et al. (2013, p. 6) always see the customer in the center of a BM and Teece (2010, p. 172) describes the BM as a hypothesis on customer needs and how the company can meet those needs. The customer as the center of the business model and driving the direction of the BM is clearly explained by Company L:

It is always essential to start with the customer. In this model, the customer is the focus and you work from the focus towards the inside and not the other way around. The company structure is built from external factors determining it and not vice versa. The customer element is most essential; nothing is more essential: Who am I talking to, what are his interests, how do I cluster them (regional, medial, focus, industry segments) and how can I cluster them. (L: #00:08:57-3#)

The results revealed that, despite being highly technology-oriented and conducting intensive R&D, the companies interviewed are also highly market-oriented, and market pull is the main driver of developments in the company. When talking about the company's own business model, companies always explain the value proposition in the form of products and/or services delivered to the customer, but also how creation of the value proposition takes place in terms of processes and resources needed. Although seen as an important part of the BM, value capture was not discussed many times during the interviews. This coincides with the findings in other research (e.g. Osterwalder (2004, p. 95)), that all other elements determine the outcome of the financial model and value capture, respectively. The author, therefore, assumes that costs as well as revenue streams are seen as an integral part of the BM that is taken for granted, thus companies do not point this out explicitly.

9.1.2 Characteristics of Flexible Business Model Elements

The goal of RQ 1.2 was to identify characteristics in BM elements that are flexible in order to cope with internal and external changes:

RQ 1.2: What characterizes elements that are flexible to respond to changes?

The elements that change frequently were presented in section 7.3, presenting the value proposition, value creation and customer element as those elements that are commonly influenced by internal and external factors causing a change in the respective BM elements.

To prepare the BM for a flexible action and reaction to such triggering factors, the elements incorporate several properties and capabilities in order to provide the required flexibility. Section 7.4 explained those characteristics as *flexibility potentials* established in the respective BM elements in order to prepare the BM to cope better and faster with situations of change. The distinct configuration of elements in a BM is described by Zott and Amit (2010, p. 220p) as *design themes*, supporting managers in the development of a BM that suits the company's needs. Although they only describe four design themes and refer them to activities in the BM, this topic can be extended by the capabilities and characteristics identified in this research. In addition, Achtenhagen et al. (2013) describe *critical capabilities* necessary for sustainable value creation; these critical capabilities are also related to the capabilities identified in this research. Figure 59 illustrates these characteristics in the BM elements discussed below.

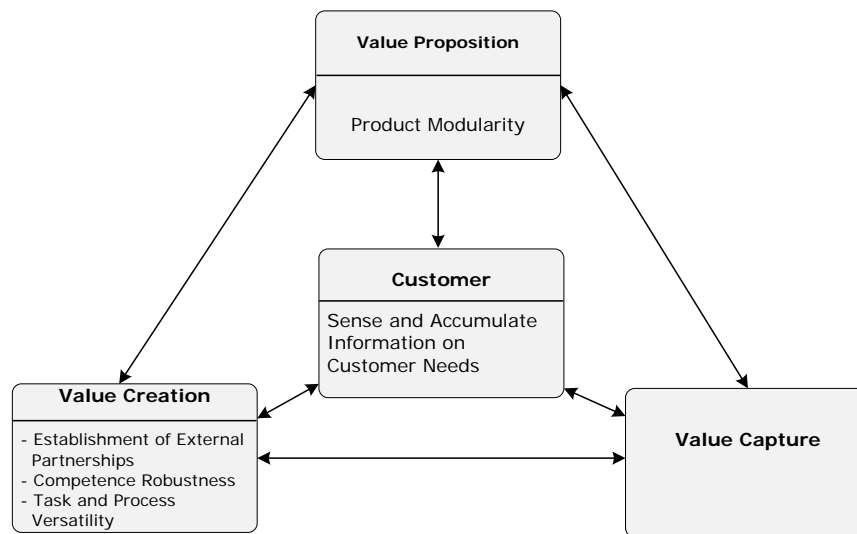


Figure 59: Flexibility potentials – abilities necessary to change a business model (own illustration)

In the literature, concepts like modularity, organizational learning, or loose coupling to enhance flexibility and adaptability are discussed broadly (see section 2). However, do these concepts also apply to the BM of companies in high-technology branches? As shown in figure 59, several flexibility potentials were identified in the BM, in particular in the value proposition, value creation and customer element.

Taking a closer look at the value proposition, *product modularity* was identified as a flexibility potential in this element. The companies interviewed highlighted the importance of modular product architecture in order to reduce the product's complexity and adapt to market trends and customer requirements or pursue growth activities within the company. This can be reinforced by the following explanation of Company M:

[...] our customers require tailor-made solutions. It is extremely costly to provide customized solutions every time. Thus, 10 years ago we started to manufacture products providing flexible, tailor-made solutions. [...] We try to provide tailor-made customer solutions based on products. This means that a flexible product is needed that consists of many modules, where complexity can be reduced by means of a flexible configuration. (M: #00:16:06-6#, #00:24:06-5#)

Modularity is also discussed in the literature as an effective concept enabling organizational flexibility (Brehm, 2003, p. 81) or strategic flexibility through product and process modularity, (Sanchez, 1997, p. 82p). In the context of BM changes, modularity is also discussed in the modularization of business processes (Doz and Kosonen, 2010, p. 379) or in the development of a networked business model¹⁰⁷, where “modularity can facilitate flexible business models” (Palo and Tähtinen, 2011, p. 377). Almeida et al. (2009, p. 31p) explain modularity in the BM in terms of a *plug-and-play architecture*, where product lines can be simply added or removed and complexity decreased. Although the companies interviewed describe business processes as an important part of the BM, modularity was emphasized in the development of modular product architecture. The possibilities provided by the fast and easy-to-use *plug-and-play* modules enhances both the speed and the scope of actions because companies can alter their value proposition according to the requirements of the market and their customers. This also increases the company’s capacity to act by serving new customer segments or new value propositions provided by the scope of actions.

The value creation element comprises three flexibility potentials in the form of *establishing external partnerships, competence robustness as well as task and process versatility*. These capabilities and properties are not completely new in BM literature as they have already been discussed. Regarding the capability of *establishing external partnerships*, the companies interviewed use external partners to source resources and competencies that are not their core element. Cooperation is seen as a good way to enhance flexibility in the BM (Schuh et al., 2005, p. 4; KPMG International, 2006, p. 5; Mason and Mouzas, 2012, p. 1362) and to reduce risks by sharing capacities (Mason and Mouzas, 2012, p. 1362). The environment is also treated as an external source of competencies, especially for sourcing commodity products (Mason and Mouzas, 2012, p. 1362). In addition, the companies investigated emphasized the importance of working together with standardization bodies or research institutions to exchange knowledge on or discuss interesting topics. In return, information on legal restrictions and regulations are received at an early stage. Company T explains the importance they see in working together with standardization bodies and researchers:

We have an R&D committee where we meet once a month together with external

¹⁰⁷Palo and Tähtinen (2011, p. 377) explicitly describe modularity as an important element in the development of a networked business model, where several actors and roles in the network exchange value for the development of a modular, technology-based service.

partners, not only to discuss existing projects, but also to discuss new ideas. For example, one professor had attended a conference and gained new insights; we have heard something interesting and asked our research staff what they think about it in order to have an active exchange of information and receive new ideas or find new possibilities. (T: #00:29:52-4#)

Companies working together with external partners increases the speed of action because competencies need not be developed internally, which may take more time. In addition, information on future developments at an early stage provides an opportunity to proceed proactively. Furthermore, external partnerships enhance the capacity to act because these partners provide flexibility when needed.

Competence robustness was also emphasized by the companies interviewed, explaining it as concentrating on core competencies that can be extended through innovation if there are possibilities available. This goes along with the establishment of external partnerships because non-core competencies and resources are sourced externally. Robustness as a concept of flexibility is defined as a “force field” enabling the company to withstand turbulences (Bahrami and Evans, 2005, p. 17p). In this context, the study by KPMG International (2006, p. 6) highlighted the importance of establishing “*a defensible position in the value chain*”, meaning that the company should concentrate on those activities where they are strongest. The companies investigated not only see their core competencies as a source of competitive advantage, but also as a form of *stability* in the distinctly uncertain environment in high-technology branches. Competence robustness helps to define the scope of actions in the company. Without the definition of a specific core element, the scope of action is too high and a threat of instability arises. Thus, the definition of core competencies also provides stability within the company. By adding activities and processes to this core element, the company can broaden its scope of actions, but without the threat of instability due to the fact that the core element of the company has been clearly defined. This was explained by Company A as follows:

In general, it can be said that a particular core competence should be developed within the organization, where the company has to look at how to further develop this competence in order to achieve a constant and stable result in a dynamic environment. If we look at a time frame of five to ten years, differentiation is possible if we have employees who are able to make good chips, specify them and so on. (A: #00:46:04-1#)

The flexibility potential identified as *task and process versatility* provides stability in the BM on the one hand as processes and tasks are clearly defined, but also because the company is able to adapt them according to specific needs on the other hand. In the literature, versatility is defined as being “*capable of dealing with many subjects*” (Bahrami and Evans, 2005, p.

16p), which also applies to the information received in the interviews. The companies in the sample require flexible staff to organize their tasks and processes *using their own initiative* and cooperate when it comes to changes. Task and process versatility increases the capacity to act because processes are designed to cope with changing situations and employees are able to switch between tasks quickly and under their own initiative. Thus, the speed at which action is taken is also enhanced because using their own initiative to deal with new situations also required the employees to be self-reliant. The following statement by Company H underpins the importance of task and process versatility in the ability of their employees:

The ability of people to implement a changed worked order, for example, [...] People need to be self-organized, be able to share information and so on so that the whole process does not stop because somebody does not know what to do.
(H: #00:23:29-6#)

The necessity to *sense and accumulate information on customer needs* was reported as an important capability in the customer element of the BM. This can be attributed to the strong customer focus of the companies interviewed, seeing the customer as a powerful driver of changes in the BM. However, sensitivity towards the developments and trends on the market was also identified as a necessary flexibility potential, which is addressed later on. “*Sensing and shaping opportunities and threats*” are described as important dynamic capabilities to survive in a dynamic environment (Teece, 2007, p. 1322); these dynamic capabilities were also transferred to business models and their importance in changing the BM (e.g. Mezger (2013, p. 6pp)). Sensing customer requirements well in advance increases the company’s capacity to act because customer needs are known at an early stage. As discussions and open communication with the customer provide the company with information prior to the emergence of customer requirements, the company can take actions to offer customers a value proposition proactively. This also increases the speed with which actions can be taken. The following was reported by Company B on the importance of sensing information from customer and market:

[...] the action of being sensitive towards the market. Thus, we are divided into business units. We also have different industry sectors where we think there are different life cycles and where markets are different [...] We not only have to be close to the customer through sales, but also through technology. Certainly, sales complete the contract at the end of the day with the opposite number, the purchaser, but technology defines the boundary conditions. [...] It is important that the customer understands us and that we understand the problems he has [...] (B: #00:26:12-8#, #00:28:31-3#)

Besides the flexibility potentials identified in single BM elements, several characteristics for the changeability of the BM as a whole were reported by the companies interviewed. They are emphasized in more detail in section 9.1.4, where RQ 1 is answered overall.

9.1.3 Interrelationship between Business Model Elements

Sub-research question 1.3 had the goal of investigating how changes in one BM element influence other elements in the BM and subsequently the BM as a whole:

RQ 1.3: How does change in one element influence the other elements in the business model and subsequently result in a completely different business model?

Three paths were identified along which the BM changes (see section 7.3) by explaining in which elements changes in the BM start and how the other elements are influenced. As figure 60 shows, the value proposition, value creation and the customer element are affected by several factors driving and causing changes in the BM. Due to the fact that the companies in the present research operate in a high-technology environment, it was not surprising that companies reported several internal and external factors causing changes in the BM. Company A, operating in the semiconductor industry, reported on the dynamics of the industry as follows:

We “look the dragon” in the eye. In general, our industry is very dynamic. [...] our customer structure is very dynamic, especially in consumer markets or consumer markets for mobile phones. Product life cycles are very short. Essentially, we try to have a mixture of markets that are stable and long-term oriented and consumer markets that are dynamic. In general, the semiconductor industry is very dynamic in the sense of how firms work together, how structures of companies change. This goes beyond organic growth and we think about what we companies can acquire. (A: #00:01:46:8#)

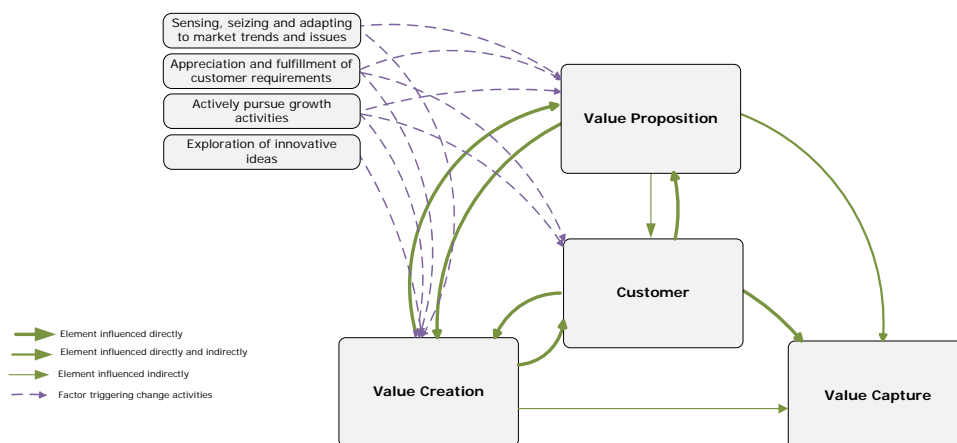


Figure 60: Changes in business model elements and their consequences (own illustration)

In the interviews, a variety of *external driving factors* were mentioned, incorporating market trends and issues, customer requirements, and political and legal authorities. These factors are not completely new in the discussion on drivers of business model changes. Osterwalder and Pigneur (2010, p. 200pp), amongst others, already described market forces as the main drivers of BM changes, also incorporating customer requirements. Customer requirements were treated separately in this research because the companies interviewed emphasized that this was very important, as a study by KPMG International (2006, p. 4) also confirmed. In addition, the crisis was also emphasized as being an important driving factor, referring to the recent crisis in 2008/2009. Almeida et al. (2009, p. 29) already discussed threats and opportunities for the BM due to situations of crisis. Some companies in this research operate in a business that is regulated and highly influenced by political and legal authorities (e.g. the pharmaceutical industry). Thus, these factors were also reported as factors driving changes in the BM. The external factors identified go along with the explanation by Horstmann (2005, p. 52pp) and Hocke and Heinzl (2006, p. 6pp) that the flexibility needs of a system are determined by environmental complexity (e.g. globalization) and dynamics (e.g. shorter product life cycles) (see section 2.3). Osterwalder and Pigneur (2010, p. 200) designate these factors as *design constraints*, because the boundaries of the BM are influenced by them. The rare discussion on the influence of competitors was particularly noticeable. The author assumes that companies implicitly integrate competitors as a market force driving changes in the BM.

Although the focus of this research was on the identification of external driving factors, companies also reported on internal factors causing BM changes. These factors include growth activities, reorganizations, cost reductions and internal innovation activities. In the literature, internal company-driving factors do not receive much consideration, but Giesen et al. (2009, p. 7) defined product and service innovation as internal drivers for BM changes. These findings imply that the research on changes influencing BM changes should not only be directed towards external factors, but also consider internal factors as well.

To come back to BM elements that are influenced by these factors, the cause-and-effect relationship and the need to align BM elements is already highlighted in the literature (Hedman and Kalling, 2003, p. 53; Zollenkop, 2006, p. 47; Wirtz, 2011a, p. 157) (see section 4.2.5) and was also revealed in the empirical study (see section 7.1). The cause-and-effect relationships were also emphasized by several internal and external factors influencing the BM, which are part of discussions on the open systems theory (Berglund and Sandström, 2013, p. 277p; Eurich et al., 2014, p. 332). Referring to the suggestion by Eurich et al. (2014, p. 335) to use a *causal loop diagram* to present interrelationships between BM elements, figure 60¹⁰⁸ presents the influences business model elements have on each other as well as the change paths in the BM that are necessary to align BM elements as well as to align the BM with the environment (Ballon, 2007, p. 8; Giesen et al., 2009, p. 9), illustrated as dashed lines in the

¹⁰⁸For the purpose of this research, an adapted form of the causal loop diagram was chosen because feedback loops as well as negative and positive influences were not available in order to draw a proper causal loop diagram.

figure. Especially Company A highlighted the importance of the alignment of BM elements and hence the balance of the BM:

I think balance is very important. This means that, in my opinion, a model needs to be so stable that if single issues change, the overall model still works anyway. I view it as a machine that needs a little oil here and there. Then I install in a new gear, but I should consider in advance whether my car will still run. And if we change something, I see it as an added benefit. When changing something in the business model, it should provide additional value. (A: #00:44:27-4#)

The analysis of the interviews revealed three different origins of changes in the BM – the value proposition, the value creation, and the customer element. The value proposition frequently changes due to product adaptations triggered by market changes or customer requirements as well as new or additional offerings. This usually leads to direct changes in value creation and, in a few cases, to direct changes in value capture and customer element; but the latter two are often influenced indirectly. This goes along with the explanation by Eyring et al. (2011, p. 92p) and Zhang et al. (2010, p. 400p), seeing the value proposition as a starting point for BM changes, followed by a definition of the resources and processes necessary for implementation and of the costs determining the price of the value proposition (Eyring et al., 2011, p. 92p). The example of Company I, operating as a service provider, explains the consequences of complementing the value proposition with additional services:

[...] we are a purely manufacturing company, but we realized that we should support the customer in development. This was the reason why we started between 10 and 20 years ago to invest intensively in development. Thus, we enhanced our competencies in the area of optical design, mechanical design or electronic design. It happens more and more that the customer takes these accomplishments into account. This means that, compared to projects already started, there are hardly any projects without developments. And that is a huge challenge and a huge change because resources in this area are low and we needed to develop resources within a small time frame. We earn our money with manufacturing in the business model; the development was always calculated as a door opener for manufacturing offerings. However, this means that if we invest more in this area, more employees are needed, we have to ensure that development also captures value [...] (I: #00:14:46-1#)

Value creation also changes frequently, provoked by internal and external influencing factors. Changes in value creation have a direct influence on the value proposition because new capabilities in the organizations or new technologies provide opportunities to offer a new or improved value to the customer. The customer element is also influenced directly, for example through improvements in the supply chain. The value capture is influenced directly, but also

indirectly. Tracing back changes in the value creation to the resource-based view, Demil and Lecocq (2010, p. 234) explain that resources and competencies determine the value proposition and the internal and external organization; volume and structure of revenues and costs are determined on this basis. Another reason is that the form of value creation, in terms of value creation depth, partners and core competencies, has to be aligned with the company's products and markets (Zollenkop, 2006, p. 88). The explanations in the literature go along with the findings in the empirical study, which are listed in appendix A.5. For example, Company G explained the interrelation between value creation and value proposition as follows:

[...] we need to think in the long term and bring one or two developments a year onto the market, which have not yet been requested, but where we expect the trend to move in this direction and where we really can offer something new. Not only small modifications should be made, but perhaps really a moderate leap in innovation. (G: #00:13:55-3#)

Changes conducted in the customer element have a direct influence on all other elements in the BM, but this does not mean that all BM elements have to change all the time. In comparison to the resource-based view of changes in the value creation, changes in the customer element can be seen as being market-driven (Globocnik, 2012, p. 25) due to changing customer requirements or growth activities. This should be emphasized by the reported example of Company M, explaining the switch from sub-contractor towards integrator and resulting in a change in the customer structure as follows:

We are a project supplier for integrators and want to take a step towards being an integrator. The customer changes a little because we now have two customers – the end-customer and the integrator; the integrator disappears and we go directly to end-customers. The product changes distinctly in the sense of services and risks. It is completely new – a new assignment – because the customer is sold something different – I take care of your problems and instead of only supplying what you need. The value capture changes as well; here all three elements change. (M: #00:21:38-7#)

The study also revealed that changes in the value capture are predominantly *consequences* of change activities in other elements. Osterwalder (2004, p. 95) as well as Meinhardt (2002, p. 30) explain that the value capture is determined by the value proposition and value creation and is the outcome of configurations in the other BM elements. In this research, the value capture element plays more the role of driving change activities, for example through decisions on cost reductions.

The investigation in the research was directed towards identifying changes in single elements and the resulting influence on other elements in the BM. Nevertheless, some companies made

general statements on changing the entire business model. For example, Company Q stated, that “*changes, for example, in the new plant in Asia, have consequences for the entire business (Q: #00:14:42-8#)*”. As such statements are very generic and do not lead to meaningful conclusions, they are not considered further in the research.

As explained in 4.2.5 and especially by Eurich et al. (2014, p. 332), the systems theory is helpful in explaining interrelationships between elements in systems. According to Vester (1999, p. 196p), an important contributor in establishing systems thinking, relationships between single elements in a system and their influence on each other can be described properly with the aid of a *cross-impact matrix*. The cross-impact matrix helps to identify the role of every single element and its interplay with other elements. The dominance and the influencing ability of an element and its participation in the entire system should be estimated with the help of this matrix. This matrix was applied to the results gained from the interviews in an attempt to better explain the findings. Table 39 illustrates the matrix for identifying the influence between single BM elements. In the matrix, the same elements are listed horizontally and vertically in the same order. As the elements are not able to influence themselves, all boxes where the same elements coincide are crossed out. For example, the value proposition is not able to influence itself. The *strength* of the relationship can have values ranging from 0 to 3, depending on the intensity. To evaluate the intensity of a relationship between two elements, the following question was asked: *If element A changes, does this also influence element B and does it also change?* Four different strength possibilities are defined:

- If element A changes, element B is influenced directly and changes as well, it scores 3. For example, the value proposition changes and thus initiates a change in value creation.
- If element A changes, element B is influenced in some cases directly and in some cases indirectly by a third element C. This case scores 2. For example, the value proposition changes the value capture in some cases directly and in some cases indirectly by changing the value creation.
- If element A changes, element B is only influenced indirectly through element C. This case scores 1. For example, the value proposition changes and leads to a change in the value creation; the change in value creation leads further to changes in value capture.
- If a change in element A does not initiate a change in element B, neither directly nor indirectly, it scores 0.

After scoring all relationships, the *active sum*, expressing the *influence strength* of an element and the *passive sum*, expressing the *influencing ability* of an element, were calculated. The active sum explains the degree of influence one element has on the rest of the system; the sum is calculated horizontally. For example, the customer element has the highest score of the

	Customer	Value Proposition	Value Creation	Value Capture	Active Sum
Customer	X	3	3	3	9
Value Proposition	1	X	3	2	6
Value Creation	3	3	X	2	8
Value Capture	0	0	0	X	0
Passive Sum	4	6	6	7	

Table 39: Cross-impact matrix of interrelationships between business model elements

active sum; this means that the customer element has a strong influencing on the entire BM. The passive sum is calculated vertically and explains how sensitive the element is to changes in the BM. (Vester, 1999, p. 197) For example, the value capture has the highest score in the passive sum; this means that the element is very sensitive to changes in the business model.

According to the active and passive sums calculated in table 39, the elements can be positioned in a four-field matrix. This matrix illustrates the roles an element can play in the system (see figure 61). Vester (1999, p. 205) describes four possible roles of an element: An active role, a passive role, a buffer role and a critical role. The element incorporates an *active role* if it has a high active sum and a low passive sum, which means that the element influences the system strongly, but inversely is not influenced strongly by the system. The customer element in the BM embodies this role. The element is *critical* if it has a high active and passive sum, which means that it strongly influences the system and at the same time is strongly influenced by the system. As visible in figure 61, the value proposition and value creation incorporate this role. If the element has a high passive sum but a low active sum, it then plays a *reactive* role, where it is strongly influenced by the system but itself does not influence the system to a large extent. The value capture plays a reactive role. The *buffer* role is the opposite of the critical role. Playing the role of a buffer means having a low active as well as a low passive sum; the element does not influence the system to a large extent and vice versa. In addition, Vester (1999, p. 205) defines a *neutral* position in between the four roles. Elements embodying this position are not suitable for controlling the system, but only for self-regulation. Value creation tends slightly towards this role, but plays more of a critical role.

The results in table 39, figure 60 and figure 61 underpin the findings in the interviews and the relationships and their intensities described. It is further illustrated that the cause-and-effect relationships between BM elements lead mostly to adaptation of the entire BM. Demil and Lecocq (2010, p. 235) explained this influence and the sequence of changes as being a *state of transitory disequilibrium*, which requires capabilities to establish a *dynamic consistency* between BM elements. The establishment of this dynamic consistency can be enhanced by creating the flexibility potentials required to cover flexibility needs, as explained in the previous section 9.1.4).

The scope of changes relates to the extent to which changes in the BM depend on the change activities undertaken and the consequences for all elements in the BM. The highest scope of

9.1 Research Question 1 – A Business Model providing Flexibility

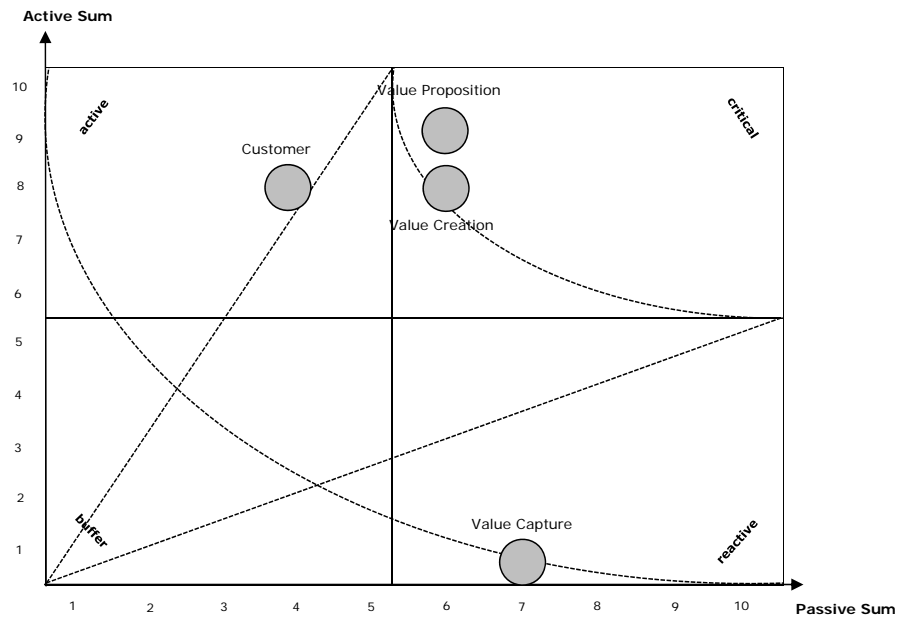


Figure 61: Role of BM elements in the “business model system” (own illustration)

change was identified when changing the customer element, as all elements are influenced directly by this. Considering the value proposition, the changes reported include extension of the offering, for example through services (e.g. Company M), or a new value proposition requested by customers (e.g. Company Q, Company S). This goes along with the explanations of Zook and Allen (2001, p. 72p), who explain that companies grow and prosper through *adjacencies from the core*, by growing as a result of opportunities emerging from the core business. These adjacencies include new products, new customer segments and channels, new geographies, new value chain steps or a completely new business. Besides the scope of change, concepts describing BM changes in the literature (see section 5.3.2) also discuss the degree of changes, spanning small, incremental improvements to radical changes. In the value proposition, incremental changes occur in the form of extending the existing product; radical changes occur if the BM architecture also changes in terms of new know-how or processes needs. Changes in value creation take place because of an increase in productivity (e.g. Company I), new technologies emerging (e.g. Company D) or innovations in the company (e.g. Company B). They are mainly of an incremental nature, conducted on a continuous basis. If new ideas or developments are highly innovative, the value proposition is also improved incrementally or changes radically in the form of establishing a new business. Changes in the customer element, for example due to a decision by the company to switch the customer segment (e.g. Company M, Company C), usually has the consequence of reorganizing the entire BM and thus, all BM elements. However, adding a new sales channel can also result in enormous BM changes, as the example of Company J illustrated. This study revealed that changes in the customer element are usually radical, discontinuous change activities in the BM, leading to a new or newly configured BM. Figure 60 and figure 61 also illustrate that the value capture is strongly

influenced by the other elements in the BM and is thus a result of changes made to the other elements. These changes are *consequences* due to changes in other elements of the BM, for example the customer element or value proposition.

9.1.4 Business Model Providing Flexibility to Adapt

The previous sections summarized and discussed the results of the sub-RQ needed to provide an overall answer to RQ 1. The overall goal of RQ 1 was to describe a business model providing the flexibility to adapt to changing needs:

RQ 1: How should the business model, with its corresponding elements, be designed so as to provide the flexibility required to adapt to changing needs?

Prior to preparing the business model to be more flexible, the business model has to be clearly defined. The core BM elements revealed – the customer, value proposition, value creation and customer element – are helpful in defining and understanding the BM. The research results illustrated that the single BM elements can be prepared to provide the flexibility required by the companies investigated. Capabilities and specific properties in elements like value proposition, value creation and customer element were thus described in section 9.1.2. However, not only the single BM elements can be designed more flexibly, also the BM as a whole can be prepared through *meta-capabilities*, as reported by the companies interviewed and explained in more detail below. This refers to the description by Wolff (2005, p. 12), explaining that the sources of flexibility are not only contained in elements of the system, but also in the entire system, which she describes as the *meta-level*.

In addition to sensing and accumulating information on customer requirements, the company also needs to develop *market sensitivity* in order to sense developments on the market. Furthermore, meta-capabilities were identified in the form of *change readiness, management of risks and learning, leadership and commitment and organizational preparation*. These capabilities are pre-conditions that enable successful execution of changes in the company and the BM, respectively. Companies especially highlighted factors determining the *change readiness* of the company, including the willingness to change, open communication or the right people who are willing to recognize improvements, willing to make changes and think out of the box. These factors are already known and have been discussed in the literature as important issues when it comes to changes in a company. A particular significance is attributed here to corporate culture. Corporate culture is seen as an important precondition for change¹⁰⁹ (Capgemini Consulting, 2010, p. 16; Gassmann et al., 2013, p. 70p) and as a critical capability

¹⁰⁹Gassmann et al. (2013, p. 70p) highlight empowerment, freedom for innovation, serendipity, high diversity of employees and communication as key success factors.

to exploit business opportunities (Achtenhagen et al., 2013, p. 431). Fulmer (2000, p. 172) emphasizes that an important characteristic of an adaptive organization is having “*people who are willing*” to change. Willingness to change also enhances the capacity to act in the organization and hence, increase flexibility (Kulenovic, 2010, p. 4p; Horstmann, 2005, p. 77p).

In addition to the company’s change readiness, the *management of risks and learning* was also reported as an important issue in preparing the organization for situations of change. Companies explained the importance of preparing for situations of crisis and of taking risks to pursue business opportunities and learn from risks taken. Countermeasures taken by the companies interviewed are monitoring and active planning of risks that may harm the business. This is also suggested by Demil and Lecocq (2010, p. 241). For companies in a volatile environment, it is important that risk-taking is encouraged and supported and failures are accepted, as this is the key to creating an adaptive organization (Fulmer, 2000, p. 162pp) and also to learning. Brehm (2003, p. 210p) describes organizational learning as an important flexibility potential to improve the capacity to act. The ability to learn and the actions taken as a result can lead to a competitive advantage. Individual learning, especially learning from mistakes, to share experiences and leverage learning in the organization is emphasized by Fulmer (2000, p. 153pp). The management of risks and learning enhances the capacity to act within the company because of the willingness to improve and learn as well as activities and countermeasures prepared in advance. The speed of action is also enhanced by this capability because the company is already able to handle such situations. *Leadership and commitment of the management team* were also reported as key success factors when it comes to situations of change. Managers play an important role because they need to recognize the necessity for change, drive this necessity and deal with the associated risks (Charitou and Markides, 2003, p. 60; Demil and Lecocq, 2010, p. 241; Massa and Tucci, 2013). Gassmann et al. (2013, p. 56) highlight the importance of the management’s commitment to change activities in the BM and to involve all employees in order to raise motivation and overcome barriers to change. The leadership and commitment of the management team is necessary on the one hand to enhance the willingness to change within the organization and on the other hand to support the implementation of change initiatives. This enhances the capacity to act in the organization thanks to the increased willingness to change as well as the speed of actions because the management commitment makes it possible to implement a change initiative within a reasonable time frame. When talking with Company D about important capabilities for changing the business model, the following was reported, covering most of the meta-capabilities presented:

As marketer, I can tell you this in a simple way – learn, turn, earn. [...] first, it is important to analyze all the time to deal steadily with the change and create a constant willingness to deal with change. This can happen in different ways, such as in innovation management in your company, where also structured innovation takes place specifically for topic innovation. [...] it also has to do with promoting

and demanding the capacity to change and the willingness to change; this can be either top-down or bottom-up. Top-down means integrating leaders in such innovations, promoting and demanding the competence of leadership behavior, change behavior and change management; as support and to remove the fear of change in the organization. [...] it also has a lot to do with internal possibilities of communication, breaking down fear barriers with an open dialog, to accompany change activities in the organization holistically [...] (D: #00:28:31-3#)

The *preparation of the organization* for fast decision-making, growth and implementation of changes was also reported by the companies interviewed. In order to prepare the organization to cope with changes and ensure further growth, the company established appropriate structures and decentralized responsibilities and decision-making. Bock et al. (2012, p. 299) already argued that a reduced complexity in organizational design enhances flexibility. Furthermore, the literature emphasizes the significance of decentralization with a high span of control, the use of temporary structures, information systems and also of adapting structures if necessary (Fulmer, 2000, p. 179; Capgemini Consulting, 2010, p. 12p). Some of these factors were reported during the interviews, which can be seen in appendix A.6. The organizational preparedness of the company enhances the capacity to act due to decentralized decision-making and groups of people being responsible for the processes and tasks in their task pane and, therefore, also for changes there. This in turn also increases the speed of actions because decisions are decentralized to where the information and competencies are available. The example of Company P should provide insights as to how the company changed their organization to further grow:

The last big change in the organization, which is still ongoing, is decentralization of the company, also referred to as internationalization or globalization, which means the transfer of tasks from the parent company to subsidiaries and regional offices. This means that we assemble in the meantime in Brasilia and soon in China, which means we have to transfer know-how, we need to hand over the responsibility. [...] leading positions are also held at other locations. This was a task that took us a decade because it was indeed lived by everybody. [...] We try to lead the company through tasks and culture and provide employees with free space. And the question is whether this is sustainable against the other system which works in the opposite way. (P: #00:03:29-2#, #00:39:41-2#; #01:02:07-3#)

All flexibility potentials identified, in single BM elements and the BM as a whole, are summarized in figure 62. The dashed lines illustrate which flexibility potentials are necessary to cover particular flexibility needs, determined by internal and external driving factors (see section 7.2). In doing so, it becomes clear that a definition of a specific flexibility potential to cover a specific flexibility need is not possible; rather, the potential that is suitable depends on the respective situation. Additionally, each flexibility need requires one or more of the *meta-capabilities*

identified, which also strengthens the significance of those pre-conditions for BM changes.

Table 40 summarizes the results and, in addition, shows the contribution by every flexibility potential to the flexibility of the organization and of the BM, respectively. As already explained in the discussion, each flexibility potential can contribute to the *scope of actions*, *capacity to act* and *speed of actions* (see also section 2.3); thus, the effects of the flexibility potentials identified were evaluated with regard to their contribution. It becomes clear that nearly all of the potentials identified increase the speed of actions in the BM, which means that the company is able to cover flexibility needs much faster. Various potentials also enhance the capacity to act due to the development of capabilities to pursue new opportunities and the willingness to act. Furthermore, the scope of action increases due to the possible business opportunities enabled by product modularity and competence robustness.

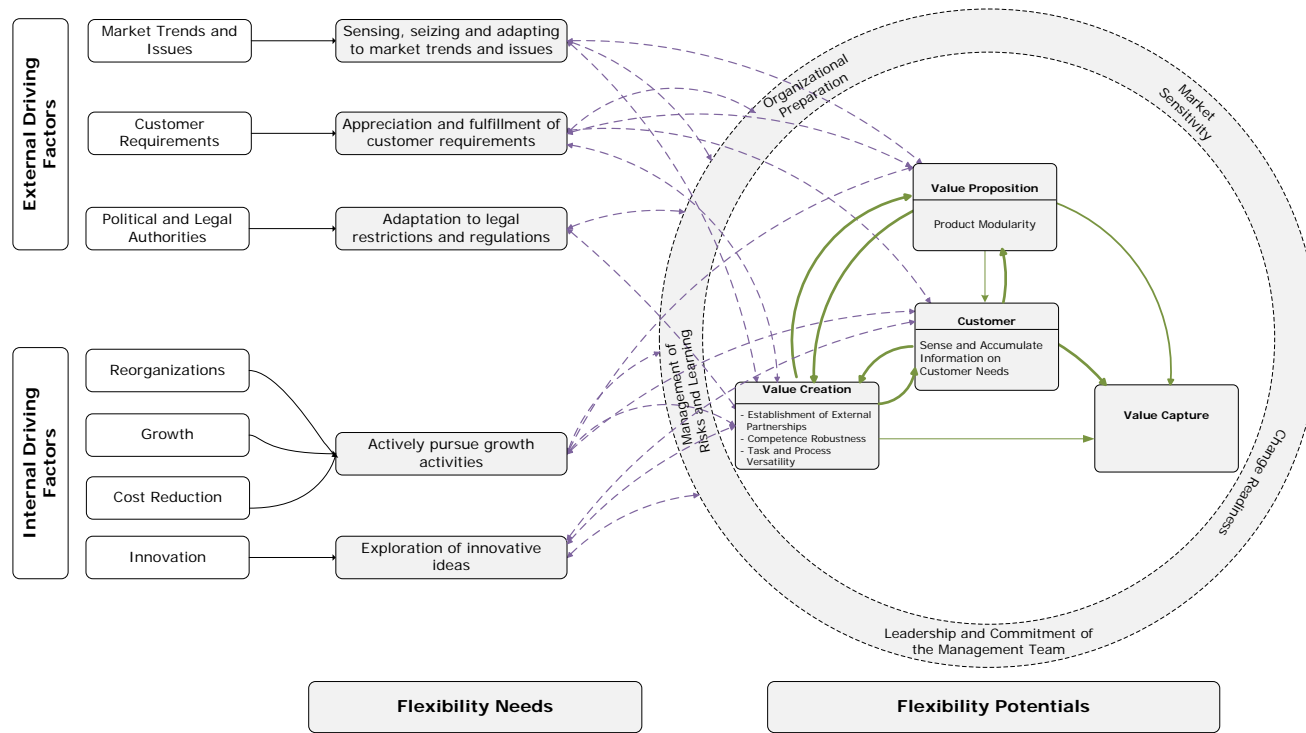


Figure 62: Flexibility of the business model through flexibility potentials to cover flexibility needs (own illustration)

9.1 Research Question 1 – A Business Model providing Flexibility

	Flexibility needs	Flexibility potentials	Effect on flexibility
Value Proposition	- Appreciation and fulfillment of customer requirements - Sensing, seizing and adapting to market trends and issues - Actively pursue growth activities	Product Modularity	- Scope of actions - Capacity to act - Speed of actions
	- Appreciation and fulfillment of customer requirements - Adaptation to legal restrictions and regulations - Actively pursue growth activities - Exploration of innovative ideas	Establishment of External Partnerships	- Capacity to act - Speed of actions
Value Creation	- Appreciation and fulfillment of customer requirements - Sensing, seizing and adapting to market trends and issues - Actively pursue growth activities	Competence Robustness	- Scope of actions
	- Appreciation and fulfillment of customer requirements - Actively pursue growth activities	Task and Process Versatility	- Capacity to act - Speed of actions
Customer	- Appreciation and fulfillment of customer requirements - Actively pursue growth activities - Exploration of innovative ideas	Sense and Accumulate Information on Customer Needs	- Capacity to act - Speed of actions
	- Appreciation and fulfillment of customer requirements - Adaptation to legal restrictions and regulations - Sensing, seizing and adapting to market trends and issues	Market Sensitivity	- Capacity to act - Speed of actions
Whole Business Model	- Appreciation and fulfillment of customer requirements - Adaptation to legal restrictions and regulations - Sensing, seizing and adapting to market trends and issues - Actively pursue growth activities - Exploration of innovative ideas	Change Readiness - Openness and Willingness to Change, Open Communication, Having the Right People	- Capacity to act - Speed of actions
	- Appreciation and fulfillment of customer requirements - Sensing, seizing and adapting to market trends and issues - Actively pursue growth activities - Exploration of innovative ideas	Management of Risks and Learning	- Capacity to act - Speed of actions
	- Appreciation and fulfillment of customer requirements - Actively pursue growth activities - Exploration of innovative ideas	Leadership and Commitment	- Capacity to act - Speed of actions
	- Appreciation and fulfillment of customer requirements - Actively pursue growth activities - Exploration of innovative ideas	Organizational Preparation	- Capacity to act - Speed of actions

Table 40: Flexibility of the business model in terms of flexibility needs and flexibility potentials

From all the results obtained to answer RQ 1, the following can be concluded:

A holistic understanding of the business model provides the opportunity to design the business model with the aim of being more flexible. In order to prevent the development of too much flexibility and, therefore, a state of chaos, the design has to be conducted with respect to issues demanding flexibility. It is also necessary to bear in mind that the business model elements are interrelated and changes in one element have consequences for the other elements and the overall business model.

Implications for Academia

By comparing the results of this empirical study to the existing literature explaining changes in the BM it was noticeable that, for example, topics like the interrelationship of BM elements and the capabilities necessary to change the BM are discussed separately. This research tried to relate those topics. Thus, contributions are made to the *degree and scope of BM changes* as well as to *interrelationships* of BM elements because it was shown that the interrelationships determine the degree and scope of BM changes, especially during situations of change. This is an important contribution to the discussion on defining and clarifying business model innovation

as it was revealed that the degree and scope of BM changes depend on the factor triggering the change as well as the specific change situation and that changing the customer element leads to major changes in the BM. These results counteract discussions on “how much” the BM needs to change in order to talk about BMI; it is more important to be aware of the scope of change in the entire BM due to the change paths illustrated. Thus, it is recommended to research business model changes with respect to factors causing the changes and to the consequences for the entire BM.

The holistic description of capabilities needed to change the BM makes a contribution to the literature on BM changes, especially on the capabilities necessary to change the BM. The existing research tends to focus on single capabilities and a detailed description thereof without assigning them to specific BM elements. This research revealed that there are capabilities and properties that can be established in single BM elements in order to prepare them for change, but also capabilities concerning the general changeability of the entire BM. As the proposed capabilities for flexible action and reaction are aligned with internal and external factors driving changes in the BM, the capabilities elaborated are necessary for coverage thereof. This prevents establishing too much flexibility in the organization. In future research, it is recommended to investigate in depth in every single BM element in order to identify additional capabilities that may also be appropriate in covering flexibility needs in order to establish a *portfolio* of suitable capabilities or properties.

Implications for Industry

For industry, the results postulate the requirement to understand the business model in order to change it as well as to develop and establish capabilities enabling BM changes. During the interviews it was noticeable that companies are not yet very familiar with business model thinking and conscious engagement with the business model concept, nor with how to change or improve it in order to gain a competitive advantage. However, the author also observed that companies are very interested in understanding how to use the business model concept and how to improve it in order to distinguish themselves from competitors.

As the results revealed, companies can build their business model more flexibly with respect to the internal and external factors determining those changes. In doing so, it is helpful to establish a basic condition for change by the *meta-capabilities* explained in the research. Furthermore, conscious preparation of the single business model elements should also enhance the ability to change. The properties and capabilities recommended are helpful here.

Knowing that changes made in one part of the business model have consequences on other parts is also valuable information. Companies know the consequences implicitly, but the visibility of these interrelationships also bring this to mind. The change paths presented show further how to align with other elements and the environment. Based on the findings discussed in this research, the following recommendations are provided to industrial organizations in order to help them consider the business model and design it more flexibly:

- The description of the business model helps to establish a holistic understanding thereof.
- The knowledge of internal and external factors causing changes in the business model establishes awareness of issues that drive the business.
- Specific characteristics can be established in the business model to deal with changes induced by these internal and external factors.
- The specific characteristics can be established in every single business model element to design them more flexibly with respect to internal and external driving factors.
- The “meta-capabilities” for the entire business model are helpful to make the business model suitable for change.
- Knowing about the interrelationships between single elements in the business model and the consequences changes have on these elements and on the business model as a whole increases the awareness of such cause-and-effect relationships.

9.2 Research Question 2 – Roles of the Business Ecosystem in Business Model Changeability

Chapter 7 and section 9.1 explained and discussed a business model that provides the flexibility to adapt according to changing needs. In this way, several internal and external factors driving those changes were identified. Based on these findings, the goal of RQ 2 was to identify the perceived *role* that the BE can play in the changeability of the BM, as described in section 8. The goal now is to answer RQ 2 and the sub-questions formulated and to discuss the results:

RQ 2: How is the role of the business ecosystem perceived in regard to the changeability of the business model?

- RQ 2.1: How are single elements of the business model affected by the business ecosystem?
- RQ 2.2: How does the business ecosystem affect the business model as a whole?

9.2.1 Identified Roles of the Business Ecosystem

The roles perceived of the business ecosystem in business model changeability can take different forms. In total, six different roles were identified, with particular peculiarities in two of them being described. The tasks of these roles are, for example, providing information or resources or being a partner in the realization of a new business opportunity.

The role of “setting the tone” is embodied by BE participants like the corporate group, government or standardization bodies, with hierarchical or co-existent relationships. Companies and organizations embodying this role make decisions on new rules and regulations which force the company affected to adjust accordingly. When discussing the results with Company U, operating in the automotive industry, they stated that these regulations and laws are not seen only as threats, but also create new business opportunities. By explaining how new regulations on a development method influence business, Company U reported the following:

[...] it also offers many opportunities. [...] [The new process] also offers an opportunity for new business models. It is somehow disruptive because the method changes completely and new and better scopes become visible. (U: #01:08:48-0#)

However, most of the companies interviewed described it in another way, namely as a role that determines the future direction of the company. The companies interviewed described opportunities arising from new regulations or laws mainly in the context of participating in the definition of these regulations or influencing them and thus gaining an advantage. This finding, therefore, requires further investigation to clarify this contradiction.

Two other roles identified are the “enabler as promoter” and the “enabler as supporter”. The “enabler as promoter” plays a key role when the company decides to enter a new business because it is only possible together with the “promoter”. In this way, the company cooperates with the counterpart, but a hierarchical relationship is also conceivable if the “promoter” is acquired by the company. The company is very dependent on the “enabler as promoter” because the company would not be able to pursue the new opportunity without the specific competencies provided by this role. For Company K, for example, the “promoter” is very important in the Idea2market business area:

[...] in this Ideas2market business area, where we want to search for products and market them, we are highly dependent on our cooperation partner because we do not have our own or such novel technologies or developments due to a lack of resources for this purpose [...] (K: #00:33:41-6#)

In comparison, the “enabler as supporter” provides competencies and resources to implement and execute a business model. This role becomes important in a subsequent phase when

implementing the BM. The relationship between the company and the “supporter” is also mainly cooperative, but so is subcontracting because resources, for example, are sourced externally. Company I explains that the “supporter” is to reduce time-to-market because *“you cannot do everything by yourself, at least you can, but it would take too much time to develop all the required knowledge by yourself, and then you would not be competitive anymore. (I: #00:36:41-0#)”*

The “initiator” takes on the role of driving changes in the company's current BM. This role also exists in two distinct forms: The “initiator as direction changer” and the “initiator as information provider”. The “initiator as direction changer” is embodied mainly by customers changing their own course of action. In Company C, a customer requested a specific technology from the company that had not yet been developed, which means that *“this creates a completely different research focus for us (C: #00:41:41-2#)”*. The company has the option to pursue and react to these changes by adapting towards the new direction of the partner. Also, suppliers and competitors can be “direction changers”. The relationships between the company in question and BE participants embodying this role are predominantly cooperative and competitive in the case of competitors. BE participants playing the role of “initiator as information provider” send impulses and information that the company can use to prepare for possible future developments or identify business opportunities in these developments. Company P uses “information providers” to discuss trends in the future: *“once a year we meet with external experts from other branches, futurologists, and so on and have a look at how the world will change. (P: #00:15:16-4#)”* As shown in table 41, this role is incorporated by many participants with whom the company has various kinds of relationships. The “information provider” is described in this research context by the companies driving changes in the BM on the basis of information they provide. An exchange of information also takes place with partners in the other roles as well. Thus, the role of an “information provider” is present in all the other roles as well.

The last role identified is the “learning partner”, where mutual learning takes place between the company and the BE participant. The experience thus gained is used to improve the BM further. Customers, competitors and other know-how providers take on this role; the relationships are cooperative and co-existent. In addition, the “learning partner” can be embodied by other roles. The examples (e.g. Company C, see appendix A.7) showed that an “enabler as promoter” as well as an “initiator as direction changer” can both be “learning partners” for the company. For Company H, third-party customers are important learning partners:

[...] we can learn a lot from third-party customers. [...] but we need to operate in a different way to perhaps gain access to other business. Here, third-party customers support us a lot [...] (H: #01:12:41-9#)

A similar discussion takes place in the literature on knowledge management in innovation networks. Valkokari et al. (2012, p. 34) identified two types of innovation partners – partners for

knowledge exploitation and partners for *knowledge exploration*. In knowledge exploitation, the company collaborates with customers, authorities and suppliers to explicitly transfer knowledge and intellectual property. This applies to the roles of “enabler as supporter”, “setting the tone” and “initiator as direction changer”, also consisting of suppliers, customers, and authorities, but also complementors or competitors. In knowledge exploration, the company cooperates with research institutes, communities and industrial forums, as well as with innovators in order to co-create new knowledge and business opportunities. This applies to the roles of “enabler as promoter”, “initiator as direction changer” or “learning partner”, where new business opportunities are pursued together and learning is of significant importance. However, the roles identified in this research not only incorporate the actors described by Valkokari et al. (2012, p. 34), but also customers, suppliers or know-how providers. Although the research by Valkokari et al. (2012) focuses on knowledge management in innovation networks, the results are comparable to the findings of this research.

In order to identify and distinguish between the roles, the relationship between the BE participant and the company as well as the position of the company itself in the business ecosystem were used. The results are summarized in table 41.

Business ecosystem role	BE participants incorporating the role	Relationship between participants and company concerned	Position of the company in the value chain
“Enabler as promoter”	<ul style="list-style-type: none"> • Corporate group • Customers • Suppliers • Complementors • Competitors • Know-how provider 	<ul style="list-style-type: none"> • Cooperative • Hierarchical 	<ul style="list-style-type: none"> • Layer Player • Mixture of <ul style="list-style-type: none"> – Layer Player-Orchestrator – Layer Player-Integrator – Orchestrator-Integrator
“Enabler as supporter”	<ul style="list-style-type: none"> • Suppliers • Complementors • Competitors • Know-how provider 	<ul style="list-style-type: none"> • Cooperative • Subcontracting • Hierarchical 	<ul style="list-style-type: none"> • Layer Player • Mixture of <ul style="list-style-type: none"> – Layer Player-Orchestrator – Layer Player-Integrator – Orchestrator-Integrator
“Setting the tone”	<ul style="list-style-type: none"> • Corporate group • Government • Standardization bodies 	<ul style="list-style-type: none"> • Hierarchical • Co-existence 	<ul style="list-style-type: none"> • Layer Player • Mixture of <ul style="list-style-type: none"> – Layer Player-Orchestrator – Layer Player-Integrator – Orchestrator-Integrator
“Initiator as direction changer”	<ul style="list-style-type: none"> • Customers • Suppliers • Competitors 	<ul style="list-style-type: none"> • Cooperative • Competitive 	<ul style="list-style-type: none"> • Layer Player • Mixture of <ul style="list-style-type: none"> – Layer Player-Orchestrator – Layer Player-Integrator – Orchestrator-Integrator

Business ecosystem role	BE participants incorporating the role	Relationship between participants and company concerned	Position of the company in the value chain
“Initiator as information provider”	<ul style="list-style-type: none"> • Customers • Suppliers • Complementors • Competitors • Subsidiary • Standardization bodies • Know-how provider 	<ul style="list-style-type: none"> • Cooperative • Competitive • Co-existent • Subcontracting • Hierarchical 	<ul style="list-style-type: none"> • Layer Player • Mixture of <ul style="list-style-type: none"> – Layer Player-Orchestrator – Layer Player-Integrator-Orchestrator – Orchestrator-Integrator
“Learning partner”	<ul style="list-style-type: none"> • Customers • Competitors • Know-how provider 	<ul style="list-style-type: none"> • Cooperative • Co-existent 	<ul style="list-style-type: none"> • Layer Player • Mixture of <ul style="list-style-type: none"> – Layer Player-Orchestrator

Table 41: Roles identified in the business ecosystem and their characteristics (own illustration)

The relationships identified between the company and BE participants are mainly cooperative, with trust playing an important role, especially in strategic partnerships. However, the relationship with organizations playing the role of “setting the tone” is more hierarchical. The importance of trust as well as the hierarchical relationship to the corporate group is explained by Company H:

For me, it is important that I can trust the supplier, just as the customer has to trust us. This basis must be established, and it is important to state this clearly in the business model. [...] To return to the strategy, we do not know how it will progress in the future, even if we receive instructions from the corporate group to stop taking third-customer business because we need the capacities for something else; we do not know. Then we can start again from the beginning. We try to react to these conditions and also try to act, at which point acting becomes more difficult because we do not have much freedom within the corporate group [...] (H: #00:15:26-2#, #00:19:17-7#)

The roles of the interviewed companies themselves in the BE vary, with many of them specializing in a value chain step in the respective industry (e.g. responsible for manufacturing a specific product for an OEM). A lot of companies fill more than one position in the network because they are present in different networks, pursuing project and product business at the same time, or have different products and/or customer groups. It was barely possible to determine the company’s role in the network distinctly because the information provided was insufficient. In addition, this would require a deep knowledge of the prevailing value chain of the industry in which the company operates. As the research focus was not on one specific industry, this was not examined for every company investigated. As a result, the link between

the role of the company in the network and the role of BE participants in BM changeability did not provide many insights. Nevertheless, it was observed that if a company works as an Integrator, like Company J, external partners are not of great significance for the business except in the case of customers:

Admittedly, we do manufacture very many items ourselves. We have electronic manufacturing, which is quite unusual, which means that we make our printed circuit boards ourselves. In mechanical production, we have C and C turning, milling, scrubbing, laser cutting, bracing, solder vacuum, and now we do laser sintering, welding, grinding plate bending in Wundschuh, also painting and pickling; so we do almost everything. We have a small glass-blowing workshop here, so we have relatively few suppliers. [...] We do not want to outsource competencies as long as we can afford not to. (J: #00:31:36-1#, #00:32:38-1#)

9.2.2 The Effect of the Business Ecosystem on the Business Model

Sub-research questions 2.1 and 2.2 had the goal of showing how single elements of the BM as well as the BM as a whole are affected by the BE:

- RQ 2.1: How are single elements of the business model affected by the business ecosystem?
- RQ 2.2: How does the business ecosystem affect the business model as a whole?

The fact that the business ecosystem is an important driver for changes in the BE was already discussed in section 5.1 and section 7.2. Figure 62 also showed which drivers cause changes in single elements and in the business model as a whole.

In addition to showing how the BE drives changes in the BM, the important BE participants and the different roles they play when it comes to changes in the BM should be investigated. In this way, the BM as a whole and also single BM elements are affected. Thus it was revealed that *value creation* (see section 8.2) is predominantly affected. In value creation, BE participants extend the resources and capability base of the company by providing manufacturing facilities, technologies, know-how or information on best practices. Mainly customers and suppliers are no longer treated as an external source providing information or resources; instead, companies take a step towards intensive partnerships, where partners are selected carefully with the goal of exchanging strategic plans and pursuing innovation together. Concepts like *open business models* (Chesbrough, 2006, p. 2p) or *value co-creation* (Romero and Molina, 2009, p. 402p) also describe the customer and other external partners as being important for value

creation, where companies remove their boundaries and work closely together. This leads to the co-evolution of partners, where both influence each other (e.g. Moore (1993, p. 75)). For Company P, working closely with partners is very important, as reported in the interview:

We moved very strongly towards single source because we are not able to share the knowledge with five companies. [...] We have seen that keeping more partners up to date does not result in the optimum product. [...] In the meantime, we have very strong development partnerships, we have insights also into the cost structures of our partner, and our partner in those service contracts knows our cost structure and knows what we want to earn, which is very open. These are business models that really have a future in my view. (P: #00:43:29-6#)

A reason for the strong influence of the business ecosystem on value creation may be the explicit consideration of external partners in the value creation of the BM (e.g. Gassmann et al. (2013, p. 24)). Shafer et al. (2005, p. 202), for example, also treat the value network as a separate element of the BM. Ballon (2007, p. 9p) designates the *value network* as an important *design parameter* for a business model, where relationships, actors and their roles are defined, also to help companies find their position in the value chain. Nielsen and Nontemari (2012, p. 143) raise the question of win-win relationships with external partners; to enable this, innovation is required in the BM. Gassmann et al. (2013, p. 22pp) explicitly highlight the importance of the business ecosystem in innovating the BM. Besides the knowledge on current and future customers, they emphasize the importance of partners providing a significant contribution to value creation (e.g. supplier, distributor, research partner) by supplying information on new ideas or as a necessary precondition for the realization of innovative ideas. This coincides with the role of “enabler as promoter”, who takes an active part in establishing new ideas, and especially with the role of “initiator as information provider”, who provides information and ideas for new developments or improvements.

Besides value creation, the *value proposition* is also influenced by the BE if companies extend their portfolio by offering products together with other companies as complementors because they are not able to do it by themselves. Or the company reinforces the value proposition by aligning its own products with those of others in the BE. The characteristics and relevance of a complementor were defined by Brandenburger and Nalebuff (1996, p. 18). They explained that the value to the customer can be increased when combined with the product of the complementor. The BE also plays a role in changes of the *customer element*, for example if companies decide to search for distributors as channels to customers. Company O seeks out distributors when expanding into foreign countries where the market is too small to establish its own legal entity:

This means either that we set up a legal entity or, if the business is too small and we do not expect it to increase, we search for a local partner. This partner is

not a legal entity, but a distributor of our products in the country concerned with whom we cooperate, but who is only linked to us by means of a sub-contract [...]
(Company O: #00:12:58-7#)

However, the BE mainly influences the overall BM, leading to changes in the entire business model. The author assumes that the reasons for this are the interrelationships shown between BM elements and the consequences of changing part of the BM (see section 9.1.3), as well as the fact that companies rarely reported any influences on specific BM elements.

9.2.3 Forms of Business Model Changeability due to Business Ecosystem Roles

The overall answer to RQ 2, how the role of the BE is perceived in regard to the changeability of the BM, should be provided from the results presented in the final two sections:

RQ 2: How is the role of the business ecosystem perceived in regard to the changeability of the business model?

It can be stated that the role of the BE in BM changeability depends on the form of BM change and vice versa; the participants embodying these roles also lead to several forms of BM change (see figure 63).

A *business model extension* is provoked by the “enabler as promoter”, “direction changer” and “learning partner”. Together with these partners, *value creation* in the BM can be extended by new or additional resources and competencies; or the product portfolio in the *value proposition* can be extended by new products offered. It was also observed how the current business was extended by including an additional business model. The “enabler as supporter” provokes the *business model scalability* by scaling the business model to the required size in order to accomplish a large project or by scaling the resources necessary in the *value creation* to accomplish a customer project. Besides business model scalability, the “enabler as supporter” also *complements the business model* with resources, know-how or proximity to customers, enabling the best possible BM execution. If BE participants incorporate the role of “setting the tone” or “initiator as direction changer”, they make decisions on new regulations or new directions requiring the company to *adjust the business model*. The adjustments are realized by changes in *value creation* through changes in the competence base or by adjusting the BM as a whole. *Business model reinforcement* can improve and strengthen the company’s own business model by means of information gained by the “initiator as information provider” or “learning partner”. In business model reinforcement, especially the *value proposition* is reinforced to meet customer needs more effectively. The forms of BM changes identified go along with some

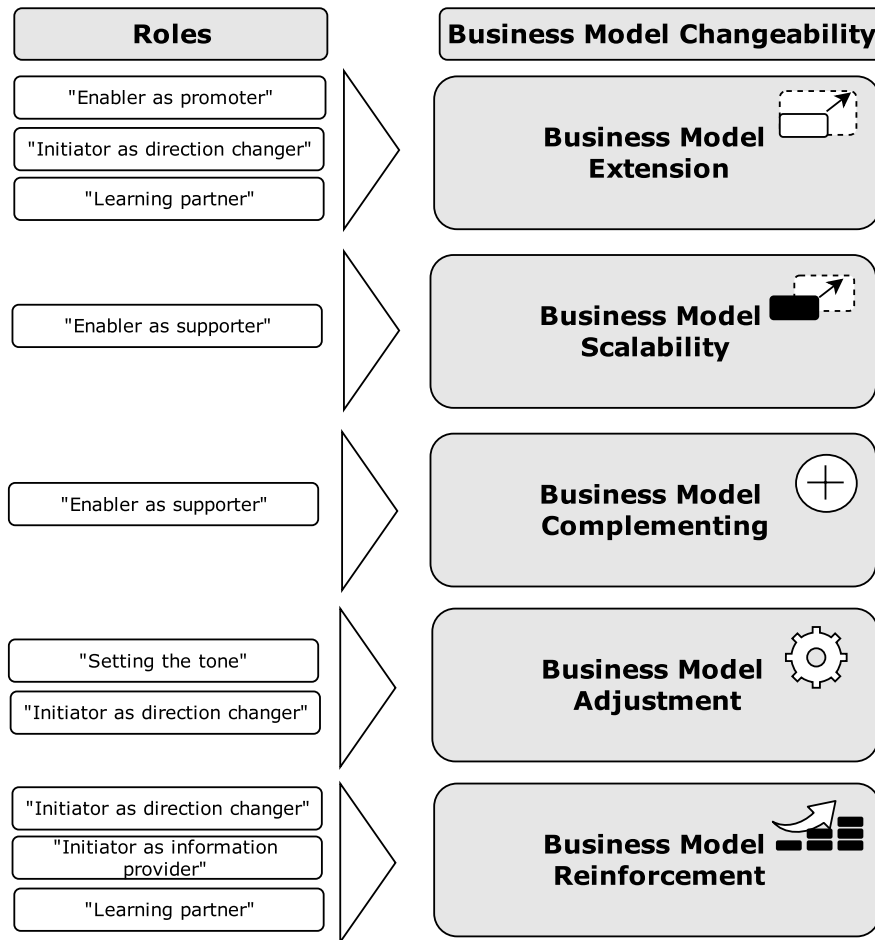


Figure 63: Forms of business model changeability and the roles leading to it (own illustration)

of the BM change concepts explained in the literature, like BM extension (Linder and Cantrell, 2000, p. 10pp; Cavalcante et al., 2011, p. 1330pp; Mitchell and Coles, 2003, p. 16p) or BM improvement (Mitchell and Coles, 2003, p. 16p) (see section 5.2), but with the distinction that this research explains them in the context of external participants influencing the BM.

The change to the business model is still seen as a task performed by the company itself, without any external partner, because it defines the strategic direction of the company. The BE actors and BE roles identified predominantly do not take an active part; rather, they are seen more as drivers of change, especially the roles of “setting the tone”, “initiators as direction changer” as well as “initiator as information provider”. However, this is currently changing as companies are tending increasingly to establish external partnerships. The importance of the company network in innovating the business model is also highlighted in the BM literature, where external partnerships are explained as a common way to innovate the business model because sourcing everything internally (e.g. only internal R&D) would be too slow and

expensive (Giesen et al., 2007, p. 31). Hence, the following can be concluded for RQ 2:

The trend is moving increasingly towards developing partnerships with participants in the business ecosystem, which influence and change the business model of the company and vice versa. Companies need to see the business ecosystem not only as a trigger for change, but have to open the business model and see external participants as important for learning, pursuing business opportunities or simply providing information. Although the change or development of the business model is still conducted predominantly by the company itself, the examples presented revealed that companies tend to cooperate with external partners in establishing a new business or involve partners in changes of the current business model.

Implications for Academia

The business environment or business ecosystem is treated in the literature mainly as a factor triggering changes. Literature on open business models or networked business models counteract by actively integrating the external environment into business activities. This research contributes to these research streams by presenting the BE roles identified and their significance in development and improvement of the BM. Furthermore, the results contribute to the research on BE, especially on business ecosystem roles and strategies. Business ecosystem thinking is a relatively new research stream that has gained more interest within the past several years. Now three roles are described that BE participants can embody, namely the keystone, niche specialist and dominator. The results of this research presented a more detailed structure of roles and characteristics, providing an additional view of them. For academia, it is therefore recommended to investigate, how strategic partners of the company can be actively incorporated when it comes to BM changes. Furthermore, it is recommended to conduct research on BE roles, their characteristics, and possible relationships between the company and these roles.

Implications for Industry

Concepts like open innovation or crowdsourcing have contributed to and ushered in the age where companies remove their boundaries in order to source external knowledge and capabilities, co-create value with the customer or conduct research together with other companies or research institutions. This has changed the way of doing business in several industries, especially in high-technology industries. The trend is moving clearly towards working in networks, and companies are requested not to shut themselves off from this trend. Companies need to have a look at how their BE can contribute to and support flexibility in the organization. As the research results showed, companies already recognized participants in the BE as a valuable source of resources and competences, for exchanging information or pursuing business opportunities together. The roles of BE participants and forms of BM change identified

underline this trend. Despite this trend towards opening own boundaries and working together with partners in the network, there are still fears present of losing intellectual properties and providing the partner with too many insights into the company.

Based on the finding of this research discussed, the following recommendations are provided to industrial organizations to help consider the importance of partners in the business ecosystem and their importance for the business model and its changeability:

- The business ecosystem should not only be seen as a trigger for change, but also as an important source of resources and capabilities, as a partner for new businesses opportunities or for learning.
- The relationship between the company and the business ecosystem participant contributes to determination of the role in business model changeability.
- The form of changes in the company's business model depends on the role the business ecosystem participant incorporates from the company's perspective.

Chapter 10

Summary and Conclusion

The goal of this chapter is to summarize the research (see section 10.1), present the main results (see section 10.2) as well as to point out limitations and directions for further research (see section 10.3).

10.1 Summary

This research work starts in chapter 1 with a presentation of the research problem. Especially high-technology companies face permanent changes and need to deal with challenges in the volatile environment in which they operate. Thus, it is important to establish a business model providing the ability to adapt to these changes (see. section 1.1). The business ecosystem plays a major role here because it provides non-core resources and competencies, enables a reduction in costs or allows partners to play a part in realizing business opportunities. Hence, the research goals of the thesis are presented: First, by developing a business model providing the possibility to deal with changing requirements and second, by highlighting the roles of the business ecosystem in business model changeability.

Chapters 2 to 5 explain the theoretical and conceptual basics needed to prepare for the empirical research. First of all, chapter 2 describes the reasons for choosing systems theory as the basic underlying theory and explains the understanding of flexibility in the context of business models, based on a systemic view (see section 2.3). Chapter 3 expounds the business ecosystem concept, various definitions, underlying theories and characteristics (see section 3.1). The concept is based on the characteristics of a biological business ecosystem and is appropriate to understanding networks, participants in a network and how they interact. In particular, the roles and strategies that participants in a BE can embody (see section 3.3.1) and the relationships that can be present between those participants (see section 3.3.2) are discussed. Chapter 4 is

dedicated to a description of the business model concept, its scientific, historical roots (see section 4.1.1) and different understandings thereof (see section 4.1.2). Based on the view that a business model consists of different elements, existing definitions are investigated in order to define the main elements of a BM (see section 4.2). The focus of chapter 5 is changing a business model. Section 5.1 highlights different external and internal factors driving changes in the BM. As the discussion of different concepts and forms of changing the business model is very much present in the literature, section 5.2 investigates by explaining and comparing several concepts. The capabilities necessary to change the BM are discussed in section 5.4.

A substantial part of this research is the empirical study conducted. The chosen research design, as described in chapter 6, is inductive and qualitative. Semi-structured interviews are used to gather the data. The reasons for this research design are already explained in section 1.3; the infant state of business model changeability and the exploratory research questions are the reasons for the research design chosen. Based on the theoretical investigations in chapters 3 to 5, theoretical considerations are conducted, forming the basis on which to establish the interview guide (see section 6.2). Section 6.3 explains the empirical phase of this research in detail, defining the sample as well as the data collection and data analysis procedures. The results described in chapters 7 and 8 are discussed and used in chapter 9 to answer the research questions.

10.2 Main Results

The present research contributes towards answering the question of whether a business model is able to respond flexibly to changing requirements and possible roles that the business ecosystem can embody in BM changeability. The research was conducted in the context of high-technology companies (e.g. manufacturer of pharmaceutical products, electronics products), as companies operating in such industries face short product life cycles, an uncertain environment and constantly changing customer needs. Besides the focus on high-technology companies, the research was limited to established companies of medium to large size. Companies in this sample face the challenge of rethinking the established BM as well as suffering from structural inflexibility and very often also inflexibility of their employees. As start-up and very small companies normally do not face such challenges, the sample was restricted to established companies.

Main Results of Research Question 1

The first research question aims at showing how to prepare the business model in order to increase flexibility to meet changing needs. As the results show, companies need to define four elements for a holistic understanding of the business model – the customer element, value proposition, value creation and value capture. These four elements help to gain an

understanding of the current business model, but also form the basis for BM improvements and changes, respectively, and for ways of designing them explicitly to be more flexible. This flexibility can be achieved with specific characteristics in the form of capabilities or properties developed in BM elements and the business model as a whole. In this way, an overall picture of flexibility potentials in single BM elements and in the BM overall was developed, enabling the company to act and react more flexibly to changing needs. Up till now, only an isolated view was provided of specific capabilities for changing the BM, but there was no overall picture as in this research. Furthermore, the flexibility potentials are correlated to flexibility needs, which are induced by internal and external factors requiring a change of the BM to prevent the company from establishing flexibility potentials that are not required. Up till now, structured correlation of factors driving BM changes and the necessary potentials to meet these changes were not considered in the context of business model changes of companies operating in high-technology branches.

In addition, the interrelationships between BM elements in the case of change situations are also highlighted. In this way, the triggering factors are assigned explicitly to those elements where the change is triggered; the investigation shows how they influence the other elements in the BM. It also illustrates how nearly all elements are influenced by changes in the BM, either directly or indirectly, leading to different degrees of BM change. This supports the discussion on the present cause-and-effect relationships between BM elements and shows the consequences of changing one element in the BM. Although the interrelationship between BM elements has already been discussed in the literature, the way in which they influence each other, directly or indirectly, has not been discussed to this extent up till now.

In short, for companies operating in the context of high-technology branches it is important to deliberately design the BM to be more flexible in order to cope with the various internal and external factors forcing adaptation of the BM. As a result, the consequences of changes for the entire BM should not be disregarded.

Main Results of Research Question 2

The second research question had the goal of identifying roles that the business ecosystem can play in the changeability of the business model and, especially, how these roles affect single BM elements and the BM as a whole. Considering the business ecosystem of the companies investigated as a network with various actors, six different roles are identified as leading to or being involved in various forms of business model changeability. These roles are important in the very early stages of business model development (e.g. “enabler as promoter”, “enabler as supporter”) or in stages where the company uses information or opportunities to change the BM already established (e.g. “initiator as information provider”, “learning partner”). Most of the time, the value creation or the BM as a whole is influenced by these roles, but this is also the case for the value proposition or the customer element. The author concludes that the strong influence on value creation results from the fact that external partners are often treated

as resources in value creation. The literature sees external partners mainly as drivers of BM changes or as collaboration partners in product innovation, but the formulation of BE roles in BM changeability have not yet been discussed in this context.

In conclusion, the external actors in the business ecosystem develop increasingly to become important partners for business activities and occupy different roles in BM changeability, ranging from being a partner in the establishment of new business to providing information necessary to improve the existing business of the company.

10.3 Limitations and Outlook

The results of this research work need to be viewed in the context of potential limitations, as presented in this section. In addition, an outlook is provided for future research.

Research Design

The inductive, qualitative research design chosen for this study is based on the research processes described by Eisenhardt (1989) and Gioia et al. (2012), which use the idea of case study research and grounded theory. In comparison to quantitative studies, qualitative studies are more of a subjective nature because they do not rely on rigor calculations. Specific quality criteria (see section 6.3.4) should ensure the rigor of a qualitative study, which the author also tried to provide in this study. To enhance the quality of this research, multiple sources and transparency were used in the research process. In spite of this, the use of multiple sources was limited to interview transcripts as primary data for the elaboration of results. Additional sources, like internal company documents, are only used as secondary data for plausibility checks. The reason for this was the non-availability of documents for most of the companies interviewed; annual reports and information on the number of employees, R&D investments or turnover were also seldom available. Another limitation concerns the *researcher bias* in data collection and data analysis, where data gathering and analysis is conducted according to the subjective perception of the researcher. To avoid this bias, third-parties not very familiar with the research should act as an *assessment or reflection guide*. (Brink, 1993, p. 36) Due to the restricted resources available, the data was only gathered and analyzed by the author of the thesis. Furthermore, the primary data is limited to information from a single interview partner in each company. As the topic of interest requires interview partners dealing with the strategic direction of the company, there was no broad basis of interview partners available. In addition, the interview partners hold a higher position in the hierarchy, which made it more difficult to obtain an appointment for the interview. As a result, only one interview partner was available in each company. This bears the risk of a *single informant bias* (Ernst and Teichert, 1998, p. 722) or an *informant bias* (Eisenhardt and Graebner, 2007, p. 28) if the chosen interviewee does not provide the data in reliable manner. As the experts were consciously

chosen by the author on the basis of availability and existing personal relationships, this also constitutes a limitation of the research. The results are also limited to companies operating in high-technology branches and the specific characteristics of these branches. This reduces the generalizability of results for other branches. Generalizability is also a controversial issue discussed in the qualitative research; due to the small sample of only 20 companies and the limitation to high-technology branches, generalizability is a weakpoint. The author suggests conducting the research in other industries in order to enhance the generalizability.

Complexity of the field of study

Another limitation is the complexity of the field of study, which raises the difficulty of discussing the topics with the interview partners. An understanding of the business model and the interrelation between all BM elements requires a proper understanding of the company and a good analytical capability on the part of the interview partner. Due to the complexity and diverse understanding and explanations of a business model, the author needed to invest a great deal of effort in analyzing the data and drawing conclusions on the meaning of the business model and on business model changeability.

Reinforcement of Results

The data collected for elaboration of the results is based on semi-structured interviews, including very broad and open questions. Thus, the results are limited to the information provided by the interviewee. Concerning the business model, no questions were asked that were specifically directed towards every single BM element. Further research is necessary in order to identify additional flexibility potentials in BM elements and to discuss and concretize the characteristics of the potentials identified in more detail. Furthermore, the flexibility discussed in the form of flexibility potentials necessary to cover flexibility needs is mainly discussed in the context of incidents that do not require “ad hoc problem-solving”. Further research is needed to place more emphasis on *firefighting* events and the flexibility potentials necessary for this purpose. The results for elements causing a change of the BM and the paths of these changes in the BM are limited due to the sparse information provided during the interviews. A clear description of these change paths requires an intensive investigation analyzing past change events in the company, which could also be a future research stream. The research on BE participants playing a role in BM changeability was focused on companies embodying these roles. In addition, it would be interesting to identify people inside as well as outside the company who played a key role in these changes, also to highlight the importance of personal relationships in such networks. In addition, an investigation of one single industry, where the prevalent value chain or value network and its steps are researched in detail, might be helpful in strengthening the relationship between the company's own role in the network and the role of BE participants in BM changeability.

Transfer of Concepts

When conducting the research, the researcher identified literature in strategic management

dealing with nearly the same issues, but from a different point of view and using different designations. These concepts were presented as *adaptive organization* or *living organization*, to name but two. The companies in these concepts are seen as living organisms, being in co-evolution with the business environment, and are able to learn and adapt. These concepts are also based on a systemic view, taking biological ecosystems as analogies for explanation of volatile environments, their influence on the company, and how companies can prepare accordingly. For the emerging literature on business model and business model changeability as well as the business ecosystem, these concepts should be discussed more intensively and transferred to the research on business model changeability in order to emphasize the strategic importance of consciously rethinking the BM.

In addition, research streams like open innovation, crowdsourcing or business ecosystems postulate a boundary-free organization. This begs the question of defining the business models of a business ecosystem and the way in which they change and evolve. This is already discussed in the literature on the business ecosystem, although rarely in the literature on business models or business model change. This topic will gain importance when more companies cooperate and collaborate in networks.

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Chapter A

Appendix

A.1 Appendix A – Interview Guideline



Flexibility of Business Models



Leitfaden Experteninterview

für das Forschungsprojekt

Flexibility of Business Models

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Anstoß und Problemstellung

In den letzten Jahren stieg das wissenschaftliche sowie praktische Interesse am Konzept des Geschäftsmodells und vor allem an der Veränderung von Geschäftsmodellen. Eine Studie der Economist Intelligence Unit (2005) hat herausgefunden, dass 55% der interviewten CEOs Geschäftsmodelle als eine größere Quelle von Innovationen sehen als neue Produkte oder Services. Ein Grund für dieses wachsende Interesse an neuen Geschäftsmodellen ist die Verfügbarkeit einer zu großen Auswahl von Produkten und Services am Markt. Für Kunden wird es zunehmend schwieriger, sich zu entscheiden. Innovative Geschäftsmodelle liefern die nötige Differenzierung zwischen den Angeboten. Um sich an veränderte Rahmenbedingungen anpassen zu können, muss das Unternehmen bzw. das Geschäftsmodell daher flexibel reagieren können bzw. gestaltet sein. Das Unternehmensumfeld ist dabei jedoch nicht mehr nur der ausschlaggebende Faktor für diese Veränderungen, sondern wird immer stärker in die Unternehmenstätigkeiten miteinbezogen. Unternehmen öffnen sich nach außen und binden ihre Partner, wie z.B. Kunden oder Lieferanten, in ihre Tätigkeiten ein. Dadurch spielen externe Partner eine zunehmend wichtige Rolle für die Entwicklung des Unternehmens.

Zielsetzung der Expertenbefragung

Ziel der Expertenbefragung ist es, Flexibilitätspotentiale und –bedarfe in Hochtechnologie-Unternehmen zu identifizieren. Im Vordergrund der Befragung stehen dabei die Identifikation der relevanten Komponenten/Elemente eines Geschäftsmodells, wie sich das Geschäftsmodell verändert, welche auslösenden Faktoren für diese Veränderungen verantwortlich sind, sowie welche Rolle einzelne Unternehmenspartner bzw. das Unternehmensnetzwerk dabei für das Unternehmen spielen. Mit einem ausgewählten Kreis an Erfahrungsträgern, welche für die strategischen Entscheidungen im Unternehmen zuständig bzw. für die Entwicklung des Geschäftsmodells verantwortlich sind, sollen die Geschäftsmodelle des Unternehmens/der Business Unit sowie Veränderungen der Geschäftsmodelle diskutiert werden. Typische Fragestellungen im Zuge der Geschäftsmodellveränderungen eines Unternehmens lauten beispielhaft:

- Wie sieht unser Geschäftsmodell aus bzw. welche Komponenten betrachten wir in unserem Geschäftsmodell?
- Welche Elemente unseres Geschäftsmodells sollen verändert werden? Werden im Zuge dessen weitere Elemente des Geschäftsmodells verändert?
- Welche auslösenden Faktoren sind für Geschäftsmodellveränderungen verantwortlich?
- Welche Partner unseres Unternehmensnetzwerkes üben einen starken Einfluss auf unser Geschäftsmodell aus?

Zielpersonen der Expertenbefragung

Zielpersonen sind Entscheidungsträger (CEO, Leiter Strategisches Management, Business Unit Leiter) oder beratende Stabstellen dieser Entscheidungsträger, die im Zuge ihrer Funktion Entscheidungen bzgl. der strategischen Ausrichtung des Unternehmens treffen sowie sich über Veränderungen des Geschäftsmodells zur nachhaltigen Wettbewerbsfähigkeit des Unternehmens verantwortlich zeigen.



Eingliederung der Expertenbefragung

Die Expertenbefragung dient als qualitative, empirische Studie mit explorativem Charakter. Sie ist Teil des Forschungsprojektes „Flexibility of Business Models“. Neben der Aufarbeitung des aktuellen Standes der Forschung dient diese Expertenbefragung als Grundlage für die Konzeptualisierung und Ableitung von Handlungsempfehlungen, um Geschäftsmodelle flexibler gestalten zu können und Fähigkeiten zu identifizieren, die dafür notwendig sind. Dazu soll das aktuelle Geschäftsmodell mit seinen Elementen besprochen, sowie Veränderungen dieser Elemente und deren Einfluss auf weitere Elemente bzw. das Gesamtmodell dargestellt werden.

Aufbau bzw. Ablauf der Expertenbefragung

Das Experteninterview ist als halbstandardisiertes, offenes Interview mit Hilfe eines Leitfadens konzeptualisiert. Dieser Leitfaden entspricht nicht der Funktion eines Fragebogens, wie er in Umfragen verwendet wird, sondern soll durch die Gruppierung von Fragen nach Themengebieten als Hilfestellung angesehen werden. Das Interview ist mit einer Länge von ca. 90 Minuten angelegt. Die Interviews werden transkribiert, anonym ausgewertet und dokumentiert. Als Teilnehmer der Expertenbefragung erhalten Sie, falls gewünscht, den Endbericht mit der Auswertung dieser Studie.

Vertraulichkeit der Angaben

Welche Daten in welchem Detaillierungsgrad Sie im Zuge dieses Interviews bekannt geben, liegt bei Ihnen. Auswertung, Analyse, Dokumentation und Archivierung erfolgen anonymisiert bzw. nach Rücksprache mit Ihnen.

Leitfragen für die Gestaltung des Interviewleitfadens

Die Untersuchung orientiert sich an entwickelte Forschungsfragen, die fallspezifisch für jede untersuchte Organisationseinheit beantwortet werden sollen und als Leitfragen für das Interview dienen. Alle gestellten Fragen im Interview beziehen sich auf die spezielle Organisationseinheit und dienen der Beantwortung dieser Leitfragen:

- Welche Elemente des Geschäftsmodells stellen die Kernelemente dar?
- Was zeichnet Elemente des Geschäftsmodells aus, um flexibler auf Veränderungen reagieren zu können?
- Wie beeinflussen Veränderungen eines Elementes die anderen Elemente des Geschäftsmodells und führen so zu einem neuen Geschäftsmodell?
- Welche Elemente des Geschäftsmodells werden durch Veränderungen des Umfeldes bzw. auch Veränderungen innerhalb der Unternehmung beeinflusst/verändert?
- Wie wird das gesamte Geschäftsmodell durch das Unternehmensnetzwerk beeinflusst.



Interviewleitfaden

Einleitende Fragen

1. Welche Funktion bzw. Rolle nehmen Sie in Ihrer Organisation wahr? Welche Aufgaben sind damit verbunden?
2. Wie offen steht Ihr Unternehmen Veränderung gegenüber? Wenn ja, was war die letzte größere Veränderung in Ihrem Unternehmen?

Probe: Wer sind die treibenden Kräfte von Veränderungen in ihrem Unternehmen? (Inno-Kultur)

3. Wie sieht das Geschäftsmodell Ihrer Unternehmung/Ihrer Business Unit aus?
4. Welche Informationen/Bestandteile müssen Ihrer Meinung nach im Geschäftsmodell enthalten sein um es ganzheitlich beschreiben zu können?

Fragen zur Geschäftsmodellveränderung

5. Welchen Stellenwert hat die Anpassung bzw. Überarbeitung des Geschäftsmodells für Ihr Unternehmen/Business Unit?

Probe: Werden Veränderungen des Geschäftsmodells als Quelle für Wettbewerbsvorteile gesehen?

6. In welcher Form/Art und Weise beschreiben Sie das Geschäftsmodell in Ihrer Unternehmung/Ihrer Business Unit? Verwenden Sie dazu spezielle Tools (z.B. Visualisierungstools wie das BM-Canvas) um Ihr Geschäftsmodell zu entwickeln und darzustellen? (*BM design*)
7. Was hat sich in Ihrem Geschäftsmodell schon einmal verändert?

Probe: Werden diese Elemente häufiger Veränderungen unterzogen als andere? Welche Gründe sprechen für die häufige Veränderung? (change elements of the BM; triggering events)

8. Wie umfangreich haben sich diese Veränderungen gestaltet? (*change elements of the BM*)
9. Waren von diesen Veränderungen jeweils einzelne Elemente/Teilbereiche des Geschäftsmodells betroffen oder hat sich dadurch das Gesamtmodell verändert? (*change elements of the BM*)
10. Welche Elemente des Geschäftsmodells müssen Ihrer Meinung nach flexibler gestaltet sein und warum?



11. Wenn Sie ein Element/einen Bereich in Ihrem Geschäftsmodell verändern, welche weiteren Elemente/Bereiche werden durch diese Veränderung direkt beeinflusst und ändern sich dadurch ebenfalls? Welche werden indirekt beeinflusst? *(influence of further elements)*
12. Welche Maßnahmen treffen Sie als Unternehmen im Vorhinein um auf diese Veränderungen entsprechend reagieren zu können?

*Probe: Welche Eigenschaften und Fähigkeiten sind dafür als Vorbedingung für Veränderungen in den einzelnen Elementen notwendig bzw. müssen aufgebaut werden?
Würden Sie bestimmte Eigenschaften und Fähigkeiten in den Elementen sehen, die dafür notwendig sind? (change elements of the BM)*
13. Welche Kompetenzen bzw. Fähigkeiten sollten im Unternehmen vorhanden sein/entwickelt werden um Geschäftsmodellveränderungen erkennen und umsetzen zu können? *(general capabilities)*
14. Gibt es in Ihrer Unternehmung spezielle Methoden bzw. Tools, die zur Wahrnehmung von Veränderungen (z.B. Kundenwünsche, Marktentwicklungen, Lieferantentwicklungen) und in weiterer Folge zur Veränderung des Geschäftsmodells eingesetzt werden? *(environmental sense making)*
15. Verfügt Ihre Unternehmung über einen Verantwortlichen für die Entwicklung des Geschäftsmodells? *(management capabilities)*
16. Was waren in der Vergangenheit Herausforderungen in der Entwicklung bzw. Veränderung Ihres Geschäftsmodells? Wie sind Sie/Ihr Unternehmen damit umgegangen? *(Org. Lernen)*
17. Welche Auswirkungen hatten diese Herausforderungen auf Ihre zukünftigen Handlungen? *(Org. Lernen)*

Das Unternehmensnetzwerk und sein Einfluss auf das Geschäftsmodell

Widmen wir uns nun einzelne Faktoren, die auf das Geschäftsmodell wirken und deren Bedeutung für das Unternehmen sowie die Veränderungen des Geschäftsmodells.

18. Welche Ereignisse bzw. Chancen in Ihrem Umfeld haben in der Vergangenheit zu Veränderungen des Geschäftsmodells geführt?

*Probe: Waren diese Ereignisse von außen induziert oder waren es interne Entscheidungen? (Triggers of change)
Probe: Wie wurden diese Chancen wahrgenommen? (environmental sense making)*
19. Gibt es viele Aussenbeziehungen (Partnerschaften, Kooperationen, usw.), die über normale Lieferanten- und Kundenkontakte hinausgehen? *(Relationships)*
20. Wie würden Sie die Beziehungen zu Ihren Partnern beschreiben? *(Relationships)*

Probe: Wie intensiv gestalten sich die Beziehungen zu Ihren Partnern? (Relationships)



Flexibility of Business Models



21. Welche Motivation war für Sie ausschlaggebend um mit Partnern intensiver zusammen zu arbeiten? (*Relationships*)
22. Welche Aktivitäten umfasst die Zusammenarbeit mit Ihren Partnern? (*Relationships*)
23. Wie sieht ihr Unternehmensnetzwerk generell aus? Wie wirken sich Veränderungen im Netzwerk auf die Beziehungen zu Ihren Partnern aus? (*Relationships*)
24. Wie würden Sie die Position/Rolle des Unternehmens in Ihrem Netzwerk beschreiben? (*Business Ecosystem Role*)
25. Wie intensiv ist Ihr Unternehmensnetzwerk in Veränderungen des Geschäftsmodells involviert? Welche Rolle würden Sie einzelnen Partnern dabei zuschreiben? (*Triggers of change*)
26. Welche Partner Ihres Unternehmensnetzwerkes üben einen starken Einfluss auf Ihr Geschäftsmodell aus?

Probe: Welche Elemente werden dabei besonders beeinflusst?

Abschlussfragen

27. Was scheint Ihnen momentan in der Veränderung von Geschäftsmodellen in Ihrer Unternehmung die wichtigste Fragestellung bzw. das größte Problemfeld zu sein?
28. Welche Fragen, Probleme, wichtige Faktoren im Bereich Veränderung von Geschäftsmodellen haben Sie im Interview vermisst, die Sie aber für sehr wichtig halten?

A.2 Appendix B – Information for the Interview Partner



Flexibility of Business Models



Experteninterview für die Studie

Flexibility of Business Models

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Zielsetzung der Expertenbefragung

Ziel der Expertenbefragung ist es, Flexibilitätspotentiale und –bedarfe in Hochtechnologie-Unternehmen zu identifizieren. Im Vordergrund der Befragung stehen dabei die Identifikation der relevanten Komponenten/Elemente eines Geschäftsmodells (z.B. Value Creation, Customer, Value Capture, Value Proposition), wie sich das Geschäftsmodell verändert, welche auslösenden Faktoren für diese Veränderungen verantwortlich sind, sowie welche Rolle einzelne Unternehmenspartner bzw. das Unternehmensnetzwerk dabei für das Unternehmen spielen. Mit einem ausgewählten Kreis an Erfahrungsträgern, welche für die strategischen Entscheidungen im Unternehmen zuständig bzw. für die Entwicklung des Geschäftsmodells verantwortlich sind, sollen die Geschäftsmodelle des Unternehmens/der Business Unit sowie Veränderungen der Geschäftsmodelle diskutiert werden. Typische Fragestellungen im Zuge der Geschäftsmodellveränderungen eines Unternehmens lauten beispielhaft:

- Wie sieht unser Geschäftsmodell aus bzw. welche Komponenten betrachten wir in unserem Geschäftsmodell?
- Welche Elemente unseres Geschäftsmodells sollen verändert werden? Werden im Zuge dessen weitere Elemente des Geschäftsmodells verändert?
- Welche auslösenden Faktoren sind für Geschäftsmodellveränderungen verantwortlich?
- Wer sind die wichtigen Partner in unserem Unternehmensnetzwerke und üben einen starken Einfluss auf unser Geschäftsmodell aus?

Zielpersonen der Expertenbefragung

Zielpersonen sind Entscheidungsträger (CEO, Leiter Strategisches Management, Business Unit Leiter) oder beratende Stabstellen dieser Entscheidungsträger, die im Zuge ihrer Funktion Entscheidungen bzgl. der strategischen Ausrichtung des Unternehmens treffen sowie sich über Veränderungen des Geschäftsmodells zur nachhaltigen Wettbewerbsfähigkeit des Unternehmens verantwortlich zeigen.



Eingliederung der Expertenbefragung

Die Expertenbefragung dient als qualitative, empirische Studie mit explorativem Charakter. Sie ist Teil der Studie mit dem Arbeitstitel „Flexibility of Business Models“. Neben der Aufarbeitung des aktuellen Standes der Forschung dient diese Expertenbefragung als Grundlage für die Konzeptualisierung und Ableitung von Handlungsempfehlungen, um Geschäftsmodelle flexibler gestalten zu können und Fähigkeiten zu identifizieren, die dafür notwendig sind. Dazu soll das aktuelle Geschäftsmodell, sowie Veränderungen auf einzelne Bereiche des Geschäftsmodells und deren Einfluss auf das Gesamtmodell besprochen werden.

Aufbau bzw. Ablauf der Expertenbefragung

Das Experteninterview ist als halbstandardisiertes, offenes Interview mit Hilfe eines Leitfadens konzeptualisiert. Dieser Leitfaden entspricht nicht der Funktion eines Fragebogens, wie er in Umfragen verwendet wird, sondern soll durch die Gruppierung von Fragen nach Themengebieten als Hilfestellung angesehen werden. Das Interview dauert zwischen 60 und 90 Minuten. Die Interviews werden transkribiert, anonym ausgewertet und dokumentiert. Als Teilnehmer der Expertenbefragung erhalten Sie, falls gewünscht, den Endbericht mit der Auswertung dieser Studie.

Vertraulichkeit der Angaben

Welche Daten in welchem Detaillierungsgrad Sie im Zuge dieses Interviews bekannt geben, liegt bei Ihnen. Auswertung, Analyse, Dokumentation und Archivierung erfolgen anonymisiert bzw. nach Rücksprache mit Ihnen.

Leitfragen für die Gestaltung des Interviewleitfadens

Die Untersuchung orientiert sich an entwickelte Forschungsfragen, die fallspezifisch für jede untersuchte Organisationseinheit beantwortet werden sollen und als Leitfragen für das Interview dienen. Alle gestellten Fragen im Interview beziehen sich auf die spezielle Organisationseinheit und dienen der Beantwortung dieser Leitfragen:

- Wie sieht das Geschäftsmodell der Organisationseinheit aus und welche Elemente des Geschäftsmodells stellen die Kernelemente dar?
- In welchen Elementen des Geschäftsmodells treten Veränderungen häufig auf und müssen daher flexibler sein?
- Wie umfangreich gestalten sich die Veränderungen in den einzelnen Elementen und in weiterer Folge des gesamten Geschäftsmodells?
- Vor welchen Herausforderungen steht die Organisationseinheit bei diesen Veränderungen und wie wurde damit umgegangen?
- Welche Partner des Unternehmensnetzwerkes beeinflussen das Geschäftsmodell und führen zu einer Veränderung?

A.3 Appendix C – Detailed Information on Companies in the Sample

A.3 Appendix C – Detailed Information on Companies in the Sample

Company	Position Interview Partner	ONACE Classification (Relevant Business)	Branch	Headquarters	#Employees	Interview Date	Duration of the Interview	Recorded	On-Site Interview	Fully Transcribed (F)/ In Noteform Transcribed (N)
Company A	Senior Vice President & General Manager	26.110 (100%)	Development and factory-made micro-electronic components, so called "Micro-Chips".	AUT	1,394 ¹⁾	03.07.2013	01:20:00	Y	Y	F
Company B	CEO of one Business Unit	29.310 (75%)	Development of electromagnets as well as electromagnetic brakes.	NE ³⁾	2,860 ^{1)/ca. 150²⁾}	11.12.2013	00:54:34	Y	Y	F
Company C	Business Unit Manager & Director Sales	26.110 (40%)	Microcontroller-based motor controls and controls for ergonomic solutions in the furniture industry.	AUT	100 ¹⁾	11.12.2013	00:48:18	Y	Y	F
Company D	Chief Marketing Officers for the Corporate Group & Vice President for Marketing & Communications for a Business Unit	28.290 (50%)	Production and sales of public communication systems for switching and transition technology, private communication systems and traffic control technology.	AUT	5,266/3,013 ⁴⁾	14.01.2014	01:34:06	Y	Y	F
Company E	Head of Business Development	26.300 (27%) 26.541 (14%)	Research, development, production and sales of electronic and electronic components of all kinds.	AUT ¹⁾	8,284/1,787 ⁵⁾	14.01.2014	01:00:47	Y	Y	F
Company F	COO & Managing Director Operations Head	26.110 (70%)	Development of equipment, specific machines and accessories for the semiconductor industry.	USA	> 6,500 ^{1)/540³⁾}	15.01.2014	00:58:34	Y	Y	F
Company G	Manager Business Development	23.430 (50%) 23.990 (50%) ⁶⁾	Manufacturing of electrical insulating materials, technical laminates and composites.	AUT	1,500/ 390 ⁷⁾	24.02.2014	00:54:00	Y	Y	F
Company H	Head of Change & Innovation Marketing & Global Product Manager	21.200 (100%)	Manufacturing of pharmaceutical specialties and additional pharmaceutical products.	DE ⁸⁾	38,000 ^{1)/320²⁾}	24.02.2014	01:19:53	Y	Y	F
Company I	Manager	26.700 (100%)	Manufacturing of fine-mechanical and optical instruments and machines.	AUT	297 ⁷⁾	18.02.2014	00:57:03	Y	Y	F
Company J	Development Corporate Plant	26.510 (100%)	Development, manufacturing and distribution of high-precision PC-based measurement systems.	AUT	>1,600/>920 ³⁾	04.03.2014	00:41:48	Y	Y	F
Company K	Head of Business Development	28.290 (40%)	Manufacturing of individual production systems and automation-solutions	AUT	ca. 300 ¹⁾	25.03.2014	00:59:24	Y	Y	F
Company L	CEO	26.510 (100%)	Development, manufacturing and distribution of high-precision PC based measurement systems.	DE ⁸⁾	640 ^{7)/71⁸⁾}	10.05.2014	00:40:23	Y	Y	N
Company M	Product Manager & Business Development	26.300 (75%) 26.510 (25%)	International provider of communication and information solutions for safety-critical fields.	AUT	980 ¹⁰⁾	21.04.2014	00:56:57	Y	Y	N
Company N	CEO	20.140 (80%)	Manufacturing of silage additives and probiotics.	AUT	n.a./90 ¹¹⁾	22.04.2014	00:50:36	Y	Y	N
Company O	Executive Vice President & General Manager	21.200/20.200 ¹⁾	Development, production and sales of special pharmaceutical products and active agents.	DE ⁸⁾	31.961 ^{12)/ ca. 1,000¹³⁾}	23.04.2014	01:09:19	Y	Y	F
Company P	CEO	26.510 (40%)	All-in-one solution provider of intralogistic complete solutions and automated warehouse systems.	AUT	2450 ⁸⁾	06.05.2014	01:17:05	Y	Y	N
Company Q	Business Development Corporate Group & CFO Business Unit	26.110 (80%)	Manufacturer of high-end printed circuit boards.	AUT	7,321 ¹⁾	14.05.2014	00:59:56	Y	Y	N
Company R	Head Business Development	28.120 (40%) 26.110 (30%)	Planning, manufacturing and distribution of hydraulics, electronics, sensoric, electrical engineering and electrical installations.	AUT	730 ⁸⁾	23.05.2014	01:15:43	Y	Y	N
Company S	CEO	28.290 (80%)	Planning and developing of special machine projects.	DE ⁸⁾	>450 ^{9)/57¹⁰⁾}	26.05.2014	00:27:27	Y	Y	N
Company T	Member Executive Board & CSO	28.999 (60%)	Development of technologies for energy generation; leading specialist in plant manufacturing, providing of customized turnkey solutions.	AUT	113 ¹⁾	27.05.2014	01:14:22	Y	Y	N
Company U	Portfolio Manager & 3 additional Employees	29.100 (50%) 28.290 (50%)	Research, development and manufacturing of drive systems including combustion engines.	AUT	6,650 ⁸⁾	06.02.2013	1,5h	N	Y	N
Company V	Portfolio Manager & Portfolio Manager Services for Software	n.a.	Consulting company in business processes, technical consulting in embedding and optical printed circuit boards, business development and funding.	DE	1	19.09.2014	01:41:55	Y	Y	N
						12.07.2013	3h	N	N	N
						17.10.2014	1h	N	N	N
						07.11.2014	1,5h	N	N	N

a) Interview partner was subsidiary in Austria

b) Strictly speaking, this is not a (medium-)high-technology company. However, there are good reasons why the company is integrated into the sample. First of all, the company is part of a very innovative corporate group; within the company, innovation also plays a major role. Furthermore, the company operates in high-technology industries (e.g. aviation); this means that the company is influenced by turbulence in these branches, hence another reason for integrating the company into the sample.

c) The breakdown in percentage was not available

1) Based on annual report 2013 for the whole group/interviewed company

2) Based on 2013; interviewed subsidiary in Austria

3) Based in Info-Booklet IAESTE 2013; interviewed company/subsidiary

4) End of March 2013; for the whole group and the investigated business segment

5) Based on annual report for the whole Austrian group and the segment investigated

6) Based on information available on the website; 1,500 employees worldwide, 390 in Austria

7) Information available in the internet; for the year 2012

8) Based on the website 2014

9) Semi-annual report, deadline 30th June, 2014

10) Based on WKO information 2014 (firmen.wko.at)

11) Stated in the interview

12) Based on the annual report 2013 of part of the group

13) Quelle noch klären

A.4 Appendix D – Paraphrases on Business Model Elements

Value Proposition		
Company	Paraphrase	Evidence in interview
A	The core business is the development and manufacture of analog semiconductors, especially manufacturing of micro-chips, manufacturing of semiconductor wafers, testing and packaging.	A: #00:17:18#
B	Offering tailor-made products in niche segments of the automotive industry. These niches are CO2-reduction, safety, comfort.	B: #00:01:27-2#, #00:06:10-4#, #00:07:28-5#
C	The offering differs according to the two business segments home and office: Standard control systems are offered in the office sector and specific solutions in the home sector.	C: #00:05:43-6#
D	Provider of intelligent transportation systems with toll collection systems as core business. The offering is project-dependent and can range from providing know-how, development of concepts, supply of components, to operating as supplier of the entire system.	D: #00:06:58-2#
E	Producing and selling of products like turbines or switch-gears as classic product business. Turn-key development of constructions with full responsibility. Offering of services as the third business segment. Intermediate forms of businesses are possible.	E: #00:05:01-8#
E	What are the accomplishments that have to be delivered to the customer, as defined in the contract?	E: #00:09:40-5#
F	Solution provider in the semiconductor industry. Responsible for the "Clean" product group, which offers machines as well as service and process know-how for cleaning the wafers.	F: #00:04:29-7#, #00:08:23-6#
G	Manufacturer of insulation products in different sectors; in the energy sector, the main fields are high-voltage as well as low-voltage and transformers. The definition of customer value is important – what does the customer need and how well can this requirement be fulfilled.	G: #00:00:48-9#, #00:05:20-3#, #00:07:20-6#
H	The value is clearly defined – value delivery for the corporate group as an extended workbench producing pharmaceutical products and dietary supplements according to forecast tasks. Further, solution provider for third-party customers to strengthen the position and make use of unused capacities. The values provided to the customers are low-volume manufacturing, flexibility and on-time delivery at reasonable costs.	H: #00:03:59-0#, #00:11:20-9#
I	Service provider in the development and manufacture of medical and optical technologies; spanning all steps from the idea to the finished product.	I: #00:05:11-0#, #00:06:14-0#
J	Offering high-technology measurement systems for the laboratory and process fields. The real value provided to the customer is the measurement and not the measurement systems.	J: #00:03:12-2#, #00:08:12-3#
K	The value offered by the portfolio is the company acting as general contractor and the flexibility facilitated. Provision of special systems where no standard system is available on the market.	K: #00:12:58-4#
L	One business model deals with tools for the R&D engineer. The second business model offers the monitoring and surveillance of power electronics and power supply. The value proposition defining which value is provided is the second important element in the business model.	L: #00:04:16-4#, #00:09:31-5#
M	What is sold to the customer, the product, is the central point of the business model. The product consists of hardware and software in the area of civil and military aviation security. All products are tailor-made for the customer.	M: #00:06:27-1#, #00:16:06-6#, #00:18:21-8#
N	Two different business models: Offering silage products from a single source, beginning with R&D through to sales. The second operates as a service provider in the biotech branch by providing a huge facility for manufacturing.	N: #00:08:20-1#
O	The value proposition defines what the company does and why. The core businesses of the company are the development, manufacturing and selling of pharmaceutical and medical products for the critically ill.	O: #00:06:53-0#, #00:08:16-5#
P	Providing technologies for logistic processes in particular branches. Solution provider for customer problems by supplying turnkey technologies with the aim of establishing value for the customer and customer's customer.	P: #00:04:54-6#, #00:09:46-9#
Q	Operating as a manufacturing service provider by manufacturing printed circuit boards based on different technologies and complexity steps according to the designs provided by the customer. Additional services are offered in engineering and optimizing the designs. This differs in the new field of IC-Substrate, where an innovation partnership exists with customers.	Q: #00:03:18-1#
R	Different business models in the company (drive engineering, system technology, electronic systems, facility engineering, service & maintenance); value proposition depends on the respective business model. The value proposition describes what added value is created.	R: #00:04:34-5#, #00:13:58-9#
S	Special engineering by offering customer-oriented special solutions in the automobile and medical industries for assembly and test bench areas. New business models in planning and manufacturing of huge LED screens. First business was software development in e-planning area. The basic need has to be visible in the business model.	S: #00:00:52-1#, #00:02:42-4#
T	Classic plant construction by offering technologies in the field of renewable energies, concentrating on the utilization of waste; specialization in bio-fuel and bio-gas plants; additional area is the analysis of existing bio-fuel plants for improvements.	T: #00:01:23-4#, #00:02:36-9#, #00:03:41-4#

Value Capture		
Company	Paraphrase	Evidence in interview
A	Value capture consists of products and margins generated from selling the products. Decisions need to be made on the price that can be achieved with the product and product features, and which costs are thereby incurred.	A: #00:36:48#
B	Value capture by bringing developments into serial production because money is earned by manufacturing the products and the number of units manufactured, respectively.	B: #00:06:41-3#
D	The revenue component is also specific in every project and depends on the involvement of the company in the project. This can be a fixed or a variable rate in the system.	D: #00:22:53-3#
E	The financial model describes how the revenue stream is defined, also considering possible investments. This is needed to define the business model.	E: #00:10:23-8#
F	The financial aspect is important; generating profit from selling the machines is the goal.	F: #00:06:43-6#, #00:08:59-3#
G	Investments in machines, in the laboratory and R&D and the general alignment in this direction are necessary to maintain technology leadership.	G: #00:06:35-9#
H	The possible value capture with the corporate group is regulated in a guideline in which the profit is fixed. Third-party customers require a good quality and a good price; variations in margins are thus possible.	H: #01:09:32-7#
I	Value capture is only assured if the customer is willing to pay for the competencies. At the moment, the customer pays only for manufacturing and not for development.	I: #00:11:24-3#; #00:15:38-5#
J	Selling measurement systems through the web shop and sales; service contracts exist mainly in process applications.	J: #00:05:37-6#, #00:07:34-7#
L	Costs and prices are important factors to understand the business model.	L: #00:10:07-1#
M	Value capture through knowing how the money is earned or for what the customer is willing to pay. Pricing is based on hardware because the company is historically a hardware manufacturer; this is currently changing. Money is only earned in the final two phases of the project. The first two phases cost a lot of money in the organization.	M: #00:06:50-1#, #00:18:42-0#, #00:19:27-0#
P	Value generation for the company and the customer is important; not only through the EBIT, but also through generated value growth of the customer basis, technology development, plants, acquisition of companies, and so on.	P: #00:11:28-1#
Q	The value added for the company and the cost structure in comparison to competitors.	Q: #00:05:53-0#
R	Revenue model describing how the company earns money; is described in the budget.	R: #00:14:12-2#; #00:33:42-5#
S	The business model needs to be economical.	S: #00:02:48-3#

Value Creation		
Company	Paraphrase	Evidence in interview
A	The core value creation process is a business development, marketing and sales process. Value creation starts with the raw material, followed by the development of chips, producing and delivering them.	A: #00:17:49#
B	The basis is a quality management tool according to ISO16949, situated between the customer requirements and customer satisfaction. The business model is displayed between the two.	B: #00:11:59-9#
B	Self-development is an important USP because patents ensure a difficult underlying situation and the serial production of developments.	B: #00:06:26-4#
C	Position in the value chain needs to be understood.	C: #00:08:01-1#
D	The role in the value chain determines the business model. The role depends on the general conditions, the legal framework, climate or geographical conditions. Options extend from spanning the entire value chain, just a part of it, or being part of/leading a consortium.	D: #00:08:58-9#, #00:16:10-2#
E	The processes needed for the development as well as which qualifications are necessary.	E: #00:11:04-5#
F	Processes are important for the business model. All processes are designed to implement customer requirements; most of the processes are designed for change as well. Manufacturing as well as distribution are performed by companies within the corporate group.	F: #00:04:34-5#, #00:06:44-8#, #00:09:52-1#, #00:19:52-0#
H	Manufacturing of medical and dietary supplement products. Value creation describes the main activities of the company; also the positioning in the value chain needs to be clear.	H: #00:04:04-0#, #00:11:04-7#
I	The competencies available and what can be realized with the competences needs to be clear.	I: #00:10:40-2#
J	Value creation through development and manufacturing mainly takes place in Graz, but also at the subsidiaries in Germany and Switzerland. Sales are conducted by 20 subsidiaries around the world; they only sell the products and provide service. Service can extend from a simple supply of replacement parts and maintenance to complete service contracts.	J: #00:04:46-1#
K	Market leadership by holding patents in special core areas, especially in measurement technologies and powertrains.	K: #00:13:42-7#
L	Important factors are how value creation takes place, which partners are required as well as key factors like production, know-how or technologies. Concept, the entire architecture, controlling of the development, and internal hardware and software development mainly through external partners, but this is changing.	L: #00:02:30-6#, #00:09:38-9#
M	Business is conducted over four phases: pre-offer phase, offer-phase, project, after-sales. Own hardware manufacturing in Austria, own electronic department and own software development.	M: #00:06:27-1#, #00:07:58-5#
N	Value creation takes place internally except sales, which is conducted by the corporate group. Core competencies are lactic acid bacteria for agriculture; in bio-tech there are other bacteria for other applications. Core competencies are in microbiology and bio-technology in specific segments.	N: #00:08:31-3#, #00:11:07-8#
O	Developing, manufacturing and selling the pharmaceutical products for the critically ill. Value creation in the sense of how development, manufacturing and logistics are handled.	O: #00:07:53-1#, #00:08:36-1#, #00:08:50-5#
P	The supply chains served are different; knowing the requirements and then trying to cover the entire supply chain by following the target of being the counterpart for the entire supply chain. Not only manufacturing of a product, but also offering services.	P: #00:05:04-5#, #00:06:46-4#, #00:09:14-5#
Q	Knowing where the supply chain is represents an important aspect of the business model. Know-how and available assets make the difference in the business model because they are not visible at first sight and are difficult to compare. Differentiation also takes place through patents.	Q: #00:05:49-5#, #00:06:04-7#,
R	The value creation model, describing what is needed to fulfill the value proposition.	R: #00:14:05-7#
T	Fulfillment and support of the customer throughout the project: Basic engineering, detailed engineering and buying the entire equipment from sub-suppliers, building the complete plant or outsourcing plant construction under surveillance, and after-sales.	T: #00:01:43-4#

Customers		
Company	Paraphrase	Evidence in interview
A	Three customers: Investors, employees and customers. Connection with the actual customer takes place through two channels – direct customer sales and distribution; therefore key account management and relationship management exist.	A: #00:18:54#, #00:28:43#, #00:31:08#
B	Constant customer contact is important; takes place through customer visits to understand problems and how they can be solved. Customer contact exists not only through sales, but also engineering.	B: #00:28:30-8#
C	Customers in the two business units, home and office, are different. Customers in the home area are consumer brands. Sometimes customers are not furniture manufacturers, but system partners constructing the table frame (in the office area) or the bed frame (in the home area).	C: #00:05:38-0#, #00:08:12-3#
D	Customers are buying-centers and at a level of a state where 300-500 involved parties operate. Furthermore, there are technological experts, consultants hired by the government or street operators acting as a mediator between them and the tenderer.	D: #00:24:06-6#
E	Different customer segments, for example energy suppliers or refineries.	E: #00:05:01-8#, #00:12:35-6#, #00:16:18-4#
F	Customers are in the semiconductor industry; primary customers are intermediaries of regions, organizing the sales of tools. Customer requirements are primary concerns; if they change, an attempt is made to fulfill them.	F: #00:04:34-5#, #00:05:26-3#, #00:19:52-0#, #00:48:33-3#
G	Customer orientation is the main focus; not losing sight of the customer is important. Customer segments are multinational companies like the BP Group, the entire Siemens Energy Sector, Alstom or General Electric.	G: #00:07:20-6#, #00:31:30-3#
H	Customers are the corporate group as well as third-party customers. Understanding the customer is necessary and is the focus of the company – what does the customer need and for what is he willing to pay.	H: #00:04:04-0#, #00:04:26-3#, #00:12:03-8#
I	Knowing the customers and the market are important to ensure that the competencies are needed and accepted.	I: #00:10:59-3#
J	Customers are in different branches, like the beverage industry, oil industry or pharmaceutical industry. The value proposition, the measurement, is the same for all branches.	J: #00:03:20-5#
K	The main revenue is generated in the automobile industry; other industries are consumer industry, medical technology or the electronics industry.	K: #00:02:32-0#
L	The customer is the focus; the business model starts with the customer; the company orientates from the outside in. Important aspects are the classification of customer segments, their interests, distribution channels and building long-term relationships. The customers of the first business model are R&D engineers; customers in the business model providing the monitoring and surveillance of power electronics are network operators (e.g. E-Control).	L: #00:04:16-4#, #00:08:57-3#
M	The customer is significant; customers are in civil or military aviation security and range from nations or organizations close to nations. Every nation is represented by one customer.	M: #00:06:27-1#, #00:18:16-5#
N	The largest customer is the corporate group; the corporate group is responsible for sales.	N: #00:08:13-4#
O	Main customers are doctors and pharmacists in hospitals and the critically ill in the home-care sector. Knowing for whom the value is created is vital.	O: #00:07:20-5#, #00:08:33-9#, #00:24:14-3#
P	Customers are represented by different industries like pharmaceuticals, fashion and lifestyle, food industry, and so on; in these industries, the entire supply chain is covered. For the business model, understanding the customer is relevant.	P: #00:05:18-4#, #00:06:46-1#
Q	Knowing the customer is relevant for the business model.	Q: #00:05:44-3#
R	In the discussion about the business model, target customers or potential target customers are defined. Customers are normally OEMs building machines or facilities.	R: #00:20:14-4#, #00:24:29-8#, #00:25:55-3#
S	The market where the business model is positioned needs to be known.	S: #00:02:38-1#

A.5 Appendix E – Paraphrases on Changing Situations of the Business Model

Value Proposition First Element Changed			
Evidence in interview	Paraphrase	Trigger	Further elements influenced
A: #00:44:27-4#, #00:47:12-0#	The customer side is very dynamic because of changing customer needs. Processes and resources should absorb customer dynamics.	Customer	VC
C: #00:28:51-5#	Identified the trend in the industry to integrate forward. This was seen as a chance and also taken by the company; thus the decision to move forward from being a purely electronic supplier to a supplier of engines and powertrains too. This offers the customer the opportunity to buy from a single supplier because the entire know-how is now in-house. This was also seen as a possibility to double the revenue.	Market Trends	VP -> VC/VCA
E: #00:23:08-5#	A detailed description of the value proposition is sometimes difficult in projects. This requires flexibility in the accomplishments and deliveries because sometimes changes are necessary. This leads to "quarrels", who has to pay for the changes as the customer only wants to pay what was agreed. The fit between the value proposition and the value capture/revenue stream has to be insured.	Internal/Value Creation	VP -> VC/VCA
E: #00:26:12-8#	Changes in the energy branch led to the development of a lot of wind farms and implementation of solar energy in Europe. Therefore, gas power stations are only used in a reduced form, only when it is dark or no wind is blowing. But all contracts are intended for use of gas power stations, as well as services and so on. Thus, a solution is required that benefits the customer and the company.	Market Trends	VP -> VC -> VCA
F: #00:09:51-9#, #00:19:52-0#	First priority is customer needs. If the customer needs change, the company tries to realize this. If there are different ways to supply a better service to the customer, this is implemented. Then, all business processes are adapted to provide a better service to the customer.	Customer	VP -> VC
G: #00:41:04-0#	The customer value and customer needs led to the active search for partnerships. The offering is a combination from the company and the alliance partner together.	Customer	VP -> VC
H: #00:12:03-8#	Always tries to understand the customer's needs. What are the customer needs and is he/she willing to pay for them. This is the starting point, investigating where to position the products; what suppliers are necessary for my product.	Customer	VP -> VC
I: #00:14:46-1#, #00:15:26-3#	Customers request development services more and more. Up till now, development services were door-openers for new contracts. To offer this service, resources need to be established in that area. In the past few years, continuing improvement in optical design, mechanical design or electronic design took place to be able to offer the services. If more is invested in the developments, money needs to be earned in the future with that area.	Customer	VP -> VC -> VCA
L: #00:14:51-5#, #00:17:03-7#	Customer requirements and problems they try to solve drive business model changes. The modular system offers the possibility to add new technologies which need to be integrated. Existing technologies are improved or new and existing technologies are combined. This also concerns the development. These solutions were not planned, but offered the possibility to solve problems for new customers or entering new markets.	Customer	VP -> VC -> C
M: #00:21:02-5#	The change from a hardware company to a software company changes the product; the product needs to be extended by services; further, the revenue streams change as well.	Growth	VP -> VCA
M: #00:24:47-1#, #00:25:27-0#	Customer-tailored solutions require a flexible product design. Product modularity helps to use modules in a flexible way for customer product configurations because the modules costs are known and the price model can be configured according to this. In this situation, the products and customer are the same, but the product can be sold cheaper because of reduced costs; higher margins are possible.	Customer	VP -> VCA
N: #00:15:06-9#	Customer requested freeze-dried concentrates; this changed the product from only manufacturing liquid concentrates to manufacturing freeze-dried concentrates. This not only changed manufacturing, it also required new investments.	Customer	VP -> VC -> VCA
O: #00:22:35-0#	Because of the pricing pressure from insurance companies, some services can only be offered for extra money because these additional services also cause costs for the company. Company differentiates between customers who pay for the services or not.	Customer/Cost reduction	VP -> VCA
P: #00:33:41-9#	Technical developments and trends on the market lead to new developments and the realization of customer values. The expectations are in the foreground. The first step includes a look at how the challenge can be resolved. Then the company determines what it has available and what needs to be developed.	Market Trends	VP -> VC
P: #00:36:51-5#, #00:40:15-1#	The change from a product and equipment manufacturer towards a service company was driven by customer requirements. The processes and the organization needed to move towards providing the service tasks.	Customer	VP -> VC
Q: #00:02:30-0#, #00:31:51-9#	New business IC substrate emerges from the core business. This means a new direction for the whole company in terms of know-how, capabilities, and so on. Entering this business only works with close customer interlocking.	Customer	VP -> VC
R: #00:19:48-2#, #00:26:56-6#	Discussions on the business model should help to find new possibilities for revenues. For example, where can additional services be added, or asking the customer about the application and then the product is taken and applied to the application of the customer.	Growth	VP -> VCA
S: #00:03:17-2#, #00:18:34-2#; #00:25:29-3#	Customer requested manufacture of the LED monitor because all skills (e.g. CAD planning, control engineering) except the LED technology are available. Company actively sought out for partners to provide the LED technology.	Customer	VP -> VC
T: #01:03:36-1#	Flexibility in the business model depends on the projects. If a project is interesting and appears to fail, for example because of financial troubles, the company offers bridge financing; these additional services are requested from companies in this business.	Customer	VP -> VC -> VCA

VP... Value proposition
 VC... Value Creation
 VCA... Value Capture
 C... Customer

Value Creation First Element Changed			
Evidence in interview	Paraphrase	Trigger	Further elements influenced
B: #00:29:27-3#	The life-cycle of the product is 3-5 years; in these years, ongoing changes force adaptations of the product because of new knowledge gained. Therefore, the relationship to the customer and constant communication are very important.	Market Trends	VC -> VP
B: #00:22:38-7#	An increase in productivity means that optimizations are realized in the whole value chain, from choosing the supplier, the supply of materials, the in-house supply chain as well as delivery to the customer.	Growth	VC -> C
B: #00:20:01-8#	Idea generation in product development is important. Smart solutions are necessary to generate a USP on the customer side.	Innovation	VC -> VP
D: #00:36:02-3#	Trend of interoperability between technologies. This trend changes technologies, but also user requirements and new possibilities appear (for example vehicle-to-vehicle communication, or vehicle-to-infrastructure).	Market Trend	VC -> VP
G: #00:13:55-3#	Long-term thinking is promoted by 1-2 developments a year which have not yet been requested by the market, but where the company expects the trend to go. Thus, something new should be provided; not always small modifications, but maybe also a moderate leap in innovation.	Innovation	VC -> VP
I: #00:17:46-7#	Optimization in manufacturing with the help of Lean and 5S creates new resources for new customers and projects.	Growth	VC -> C
I: #00:18:16-8#	To stay competitive, a new assembly plant was developed in Slovakia. Devices which are not so demanding are assembled there.	Costs Reduction	VC -> VCA
K: #00:19:42-7#, #00:30:18-4#	Internationalization strategy to follow customers in different countries (e.g. going east) with the goal to achieve growth and increase revenues. For the company, it is easier to achieve growth if the same or a similar product is manufactured for an existing customer. Influences the company in terms of internal cooperation and knowledge transfer necessary.	Customer	VC -> VP -> VCA

VP.... Value proposition

VC.... Value Creation

VCA... Value Capture

C.... Customer

Customer First Element Changed			
Evidence in interview	Paraphrase	Trigger	Further elements influenced
C: #00:11:32-8#, #00:13:37-7#	Change of the customer focus towards large customers. Influenced all areas in the company. The specialized solutions did not change, but the number of pieces changed from small and medium to large. The electronics and the technology were not prepared for this, which also led to changes in the product, quality standards, but also logistics. Processes and the mindset of employees need to change as well.	Growth	C -> VC/VP
J: #00:08:56-6#, #00:10:02-2#, #00:10:40-6#	Internal decision, triggered by the customer, to build a web shop to sell products there. The consequences of this decision were that rules on revenues and service needed to be defined. Furthermore, the company needs to think about the development of products because when buying products through the web shop, the use of products needs to be clear. Also logistics and warehousing need to change.	Growth/ Customer	C -> VC/VCA
L: #00:16:15-7#	The diversity of regional markets in terms of different customer segments lead to considering which solutions work in one market and whether they would be successful in another market too.	Growth	C -> VCA
M: #00:21:38-7#	The step from project sub-contractor towards integrator changed the customer because the customer is now the end customer; the product changes because of added services; something different is sold – the company looks after the customer problem, thus the risk is also higher; the revenue streams change as well.	Growth	C -> VP -> VC -> VCA
O: #00:13:48-1#	Selling a product in another country needs a regional distribution channel. Furthermore, approval is also required for selling the product. Also marketing, sales and logistics have to follow the respective guidelines in the new country. Pricing is also an important factor.	Growth	C -> VC/VCA

VP... Value proposition
VC... Value Creation
VCA... Value Capture
C.... Customer

A.6 Appendix F – Paraphrases on Flexibility Potentials

Market Sensitivity – Whole Business Model	
Evidence in interview	Paraphrase
B: #00:26:12-8#	Market sensitivity is an important action which supports being prepared for possible changes. This needs to be done for every business unit separately because industries and life-cycles are different.
B: #00:36:57-0#	Simulation of the crises before something happens; called "flexibility tape". Simulation of losses and also growth of the market, e.g. about 20%. How can the company react; are new products already available or must they be defined first.
D: #00:43:28-0#	Ongoing market research and analysis has been accomplished; constant examination with change is essential. This is realized through innovation management, where structured innovation on specific topics takes place in different areas, also in the form of crowd innovation.
E: #00:25:29-5#	Analysis of the market takes place during the annual strategy meeting. There it is decided whether there is a need to adapt to any changes.
G: #00:16:31-8#	Monitoring of the market in terms of conference visits and exhibitions to obtain information on new technologies on the market; new technologies which are under development by the customer, new manufacturing technologies, new machines, new raw materials, and so on.
H: #00:16:55-7#, #00:39:42-1#	In the strategy meeting, the management team discusses indicators for possible changes in the future. This does not mean that the company immediately aligns in a complete new direction, but the indicators for change are at least discussed.
H: #00:41:53-0#	Forecast of signals; there must be a capability to recognize/sense particular signals.
I: #00:24:59-1#	A proactive search on the market provides information on new technologies and products. This needs to be compared to information gained from customers. However, it is important to compare own manufactured products with newly appearing products on the market to estimate how long the product will be successful.
K: #00:22:13-5#	Workshops, networking, media, and so on provide information on changes in the market. If topics of interest appear for the company, discusses how to proceed further, but it also may choose not to pursue a topic.
O: #00:34:41-6#	Processes are required that recognize and shape change. Committees or workshops with customers, for example, are helpful. Then a solution is sought together.
O: #00:26:30-6#	By working closely with public authorities, changes are seen in advance and activities can be implemented accordingly.
P: #00:15:16-4#; #00:29:18-9#, #00:32:55-0#	Market researchers and branch experts help understand what is important for consumers in the future and how an advantage can be generated for customers. It is important to see changes in time so that the change can also be influenced. Otherwise, the company can only react to it.
Q: #00:21:04-0#	There is a need for people who are sensitive in picking up new topics and developing a relation as to how this new topic can be integrated into the business model.
R: #00:37:32-6#; #00:40:54-6#, #00:47:09-1#	In the strategy process, changes (e.g. technological trends, other external changes) are sensed and discussed. If the signals according to trends are received more frequently, the company knows that it is time to act.
S: #00:11:17-8#	The ability of employees to sense opportunities on the market; to recognize whether the customer is changing the direction and following this course.
T: #00:29:52-0#	External parties (e.g. committees, researchers) provide information on future developments and customers. If the same information is received from several areas, the company must decide how to deal with it. A management team is responsible for discussing and seizing any possible changes in the market.

Change Readiness – Whole Business Model	
<i>Culture for change</i>	
Evidence in interview	Paraphrase
B: #00:24:45-5#; #00:25:19-9#	To ensure that the know-how is available at the location, the relationship between the company and employees needs to be developed and strengthened. This provides value for the location and is dependent on the culture. It is important not only to motivate people by monetary incentives, but also intrinsically through an activity that provides meaning and is fun.
D: #00:55:21-3#	Values are important; the discipline to be dynamic is one of these values. These values are implemented and pursued in the company.
P: #00:24:32-5#	Provide a culture in the organization that allows change. Employees know, for example, that changes in the company are not linked to lay-offs. Changes bring opportunities for the company; the company can only prepare for changes within the corporate culture.
T: #00:27:07-7#; #00:29:42-0#	Develop a culture for change and maintain it in order to report ideas openly and allow prompt implementation of alternative plans.
<i>Openness/Willingness to change</i>	
Evidence in interview	Paraphrase
D: #00:43:36-8#	Being able to deal with change, but also the readiness to cope with change is important.
E: #00:29:49-5#	The corporate culture is a precondition for openness and readiness to consider possibilities for the future. The openness to sense impulses from outside and the readiness to change are essential.
L: #00:23:00-9#	Accepting change as something normal and understanding why the change has happened. There must be a strong appreciation of dealing with something new and a basic readiness to make changes.
H: #00:42:06-0#	There must be strong readiness to make changes. Nothing happens if things that are heard several times are not realized and spread throughout the company. In general, the appreciation of and the readiness and openness to change must be available in order to change processes in the company.
N: #00:18:44-2#	The readiness of people to follow a new direction is encouraged in the company. This provides a means of reacting to changes.
O: #00:32:23-2#	Be open to change; personal attitude towards change. See change as something normal and not as a threat.
R: #00:41:20-6#	Have no taboos and be open for every topic. It is important to realize that every business model has an expiry date; the openness to say that the company or the business model is replaceable must be realized.
S: #00:08:50-1#; #00:12:26-7#	The reaction to changes needs to be anchored within the employees. Readiness to change and the cooperation of all employees are essential.
T: #00:27:42-9#	People need to be flexible and open to change. If people are not willing to change and are not convinced by changes, they will not be successful.
<i>Communication</i>	
Evidence in interview	Paraphrase
C: #00:17:02-1#	Flexible communication is important to mediate between customer needs and requirements and what the company is able to provide.
D: #00:46:27-9#	Possibility of communication; having an open dialogue and breaking down barriers of fear makes changes in the company possible in a holistic way.
H: #00:41:09-3#	Communication within the management team is very fast. When a fundamental decision needs to be made, the whole management team discusses it.
M: #00:38:43-4#; #00:40:47-0#	The person responsible for the change needs to communicate it. Commitment can only be generated through communication.
P: #00:25:59-2#; #00:29:04-1#; #00:30:08-0#	Not all changes can be planned; open communication is important. People need to be informed why things work a different way or do not work in the same way anymore. Dealing with change through the corporate culture is the only helpful approach.
<i>Having the right People</i>	
Evidence in interview	Paraphrase
C: #00:21:44-5#; #00:23:42-4#	Diversity of people: experience and market know-how are essential to cope with changes on the market and the business model. People integrate personal experience, but also experience with reorganizations.
D: #00:47:16-0#; #00:48:06-2#	The readiness of people to think in an entrepreneurial way needs to be fostered. Thus, the company must support the flexibility for change, establish a structure for change and actively support it.
E: #00:28:07-0#	Someone who is responsible for innovation and finds new possibilities besides product innovations.
F: #00:17:23-4#	To gain an overview of processes in a huge and complex company, people are trained to be generalists, to be able to "connect the dots" in the company, to know the processes in the different areas of the company.
G: #00:17:48-1#	The best possible education is a precondition to adapting quickly. The higher the level of education, the faster people understand that adaptation is necessary.
L: #00:21:17-4#	The basic attitude of every single employee is important for change. New challenges are welcomed within the organization. Thus, employees are encouraged to introduce new ideas, which are also rewarded with bonus payments. Selected ideas are promoted and elaborated in more detail.
L: #00:22:21-9#	A comprehension of the whole is required and needs employees who understand the whole idea and see relationships. This enables them to recognize that something needs to be changed and requires people who have an interest in doing just that.
M: #00:38:43-4#	Someone must be available to make active changes; this is essential.
P: #00:27:43-1#; #00:29:50-3#	As work is very specialized, people are needed who have an overview. It is important to know the relationships between single parts and their consequences for other parts. If all the connections and relations are known, the person will be willing to make changes.
Q: #00:21:22-2#	People who are able to implement new topics must be available. They need to think out of the box and also be able to improvise. Not only the sensing of important topics, but also their realization.
R: #00:42:31-7#	The ability to sense and seize opportunities requires that employees have the freedom and resources to implement them. To consider a topic in more detail, resources must be released very quickly.
S: #00:07:54-7#	Creative people in the company need to be flexible. This basic flexibility is essential and must come from everyone in the company. Flexibility is part of the corporate culture.
T: #00:27:49-3#	A precondition is visionary people who do not stick to daily business only, but are also unconventional thinkers who sense opportunities.
T: #00:28:42-4#	The right team for creating business model ideas is essential; furthermore, a team is required to implement these ideas. It is also important to have employees who take up the topics in their area and try to implement them there.
T: #00:24:33-4#	Flexibility of individuals is very important because a lot of changes need the cooperation and support of employees.

Management of Risks and Learning – Whole Business Model

Evidence in interview	Paraphrase
A: #00:53:12-6#	Management in loops with the help of a continuous Plan-Do-Check-Act cycle in order to reveal variances and develop countermeasures if necessary. Measurement of actions by defining KPIs based on strategic objectives, according to the balanced scorecard.
A: #00:58:04-5#	Improvement program to receive new ideas and derive measures and actions. With the help of the business model canvas, new possibilities and improvements of the business model are discussed.
C: #00:19:08-2#, #00:20:52-5#	Risk assessments to show what happens if the economy changes. List the risks, weight and score them with a probability of occurrence. In addition, various scenarios in the different areas, especially for the budget, are elaborated. This is handled by the management team once a quarter.
D: #00:43:51-5#	It is important to cope with change. This happens in innovation management, where structured innovation takes place in certain areas.
F: #00:14:02-5#	Installation of an accountability system to learn from experience and improve business processes. With the help of Plan-Do-Check-Act, the company tries to learn from insights and mistakes.
F: #00:19:52-0#	To hedge the risk of customer requirements or changes in requirements, information on customer needs are aligned with developments on the market concerning new product developments. A basic configuration is developed in advance which makes a fast reaction possible.
G: #00:27:30-1#, #00:28:35-4#	The strategy team consisting of board of members as well as other managers is responsible for the development of the business model. In addition, the business unit manager established a strategy workshop, where trends, developments in the customer segments and the market in 2025 are discussed.
I: #00:24:11-4#, #00:28:08-3#	Have an active technology and knowledge management to be prepared for new topics and take a leading role. In addition, support the customer in making suggestions on product improvements to ensure the success of the customer's product.
N: #00:17:39-8#	Customers demand changes in the company. The speed of implementation is important.
N: #00:24:02-5#	A lot is learned if the company takes risks and ventures forward.
P: #00:25:42-8#	Development of scenarios for huge growth, less growth, emergencies, decreases in growth and so on.
P: #00:29:31-6#	Making changes at the right time is very important. Everything that is done quickly is reaction and cannot be influenced. Thus, it is essential to cope with changes at an early stage.
Q: #00:19:07-8#	High level of flexibility is required because customers supply to consumer segments, and forecasts deliver only vague information on how well the product is selling. Thus, companies must plan what to do when a project ends.

Leadership and Commitment – Whole Business Model

Evidence in interview	Paraphrase
C: #00:21:44-6#	Seniority and experience of the managers in the industry are important, as is a basic set of skills.
D: #00:44:42-5#	The leaders need to be part of such innovation activities to support and demand their competencies of leadership, behavior during change and change management. This supports breaking down the fear of change within the organization and the competence for constant adaptation of the value proposition as well as raising the general competence to change.
F: #00:15:46-4#	Specialists in different fields are required in order to cope with change. However, most of the topics requiring a change are synchronization topics, requiring a proper gut feeling. This is an important part of leadership.
H: #00:44:37-2#	There has to be somebody available who cares. In projects, it is important to have somebody who looks after the project.
H: #00:32:45-6#	Restructuration within the company to deal with change. For example, single teams in manufacturing have responsibilities for groups of machines. Leadership is very important; that is the reason why single teams have the autonomy to make decisions in their area.
K: #00:23:15-6#	It is important to have a steering committee in the company which is responsible for strategic decisions. Decision makers who define the direction are needed as well.
L: #00:24:42-7#	Business unit managers together with the CEO and sales manager are responsible for development of the business model. If one person alone is responsible for such strategic developments, the authorization and experience of such a manager in developing or changing business models is essential.
S: #00:09:05-1#	All members of the management must show commitment; everybody has to react and follow the same direction.

Organizational Preparation – Whole Business Model

Evidence in interview	Paraphrase
A: #00:10:42-1#	Change of the organization towards key accounts; this balances direct customers and distribution channels.
D: #00:45:26-1#	Prepare the organization for the future. Change from a line organization to a project-oriented organization. Furthermore, division between experts and management careers to encourage people who do not seek a management position, but are very capable experts. They should not have any disadvantages regarding fringe benefits.
F: #00:25:08-5#, #00:26:01-9#	Within the matrix organization, information should be harmonized; this is not always possible. Thus, the company defined decision makers who are accountable for specific topics and make decisions; others provide opinions for decision-making. Clear structures and hierarchies are thus established.
G: #00:16:31-8#	Installation of the product management provides the company with the capability to gain a market overview and developments there. This is important because this market screening is not possible during daily business.
H: #00:32:34-7#	Restructuring within the company to deal with change. For example, single teams in manufacturing are responsible for groups of machines; or KPIs are visualized for every single employee in the organization; meetings of the foreman with his employees take place every morning. These structures and models help to secure know-how within the company.
K: #00:27:40-0#	Because of growth activities, the organization needs to be changed and prepared for the future. Remove bottlenecks by spreading knowledge and decision-making power over more people to unburden individuals.
K: #00:19:42-7#, #00:21:01-3#	Internationalization in the form of new subsidiaries influenced headquarters; cooperation is necessary, knowledge and knowledge transfer need to be ensured to guarantee that all employees around the world are well informed. The cooperation of all functions in the company following a strategy is important; if this is not the case, projects cannot be realized.
L: #00:01:15-0#, #00:27:00-1#, #00:27:50-3#	To secure further growth, it was necessary to adapt organizational structures. Especially in development, the structure was changed from orienting towards an individual towards spreading knowledge over more people and changing processes. Enables more possibilities like scalability, transparency, and so on.
P: #00:03:29-2#, #00:39:41-2#, #01:02:07-3#	Globalization and decentralization of the organization to develop into a global player. Acquisition and development of further locations; establishment of a matrix organization. Leadership by tasks and culture.
Q: #00:13:13-9#	Organization changes because of the organizational transition. Know-how dissemination, definition of focus centers and so on is required. People have to be available where decisions are made. Structure follows strategy.

Product Modularity – Value Proposition	
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Evidence in interview	Paraphrase
J: #00:12:27-9#, #00:13:36-3#	Offering products in the process area that can be adapted flexibly to customer needs. Modular architecture of laboratory devices; adaptation of the standard device in the process area according to customer needs.
K: #00:01:58-9#	Products are all prototypes manufactured according to customer needs. Standards and modules are created to reflect a more cost-efficient and favorable image on the market.
L: #00:17:31-2#; #00:20:28-0#	With a modular system, new technologies can be added easily or combined in a new way and offer new possibilities.
M: #00:16:06-6#, #00:24:06-5#	Products are tailor-made for the customer. A modular product architecture reduces complexity and enhances flexibility.
P: #00:24:00-3#	Modular-based product architecture forms the basis for products in every branch and helps react to market volatility.

Establishment of External Partnerships – Value Creation	
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Evidence in interview	Paraphrase
P: #00:24:18-8#	In order to stay flexible, it is important to have partners from whom capacities can be sourced externally.
I: #00:23:39-8#	When integrated into the business model at an early stage, partners are helpful in reacting to changes – in development as well as in manufacturing.
I: #00:21:56-6#	Working together with partners in manufacturing helps react to market volatility.
T: #00:29:52-4#	Being in standard bodies and working together with research institutions in order to talk about new and interesting topics.

Competence Robustness – Value Creation	
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Evidence in interview	Paraphrase
A: #00:46:05-6#	To achieve a constant result in a dynamic environment, development must be a core competence. Differentiation takes place through the development of capacities that can be used for changes on the market.
B: #00:10:43-6#	In order to generate new product ideas, engineers in the company's own academy collect ideas for possible new developments and approaches.
B: #00:24:45-5#	To maintain success, it is very important to develop know-how at the company's own location.
B: #00:23:52-3#	Being a technology leader is important. With patents, the company develops a USP for themselves and their customers; this makes substitution difficult.
J: #00:15:40-4#	Being up to date on technological changes is important. 20% of revenues and a big team of developers ensure that.
L: #00:20:33-4#	Choosing the right technology provides flexibility. The company must be aware in advance of what can be done with the chosen technology. This must be realized at as early a stage as possible and also provides new opportunities.
Q: #00:55:59-4#	Development of know-how and focus on topics for proactive positioning as an innovation partner. This requires a lot of effort without any immediate benefit. The company must be ahead of the customer and understand the overall context.
S: #00:09:33-5#	Financial resources must be available in order to grasp a new opportunity on the market. This is a basic prerequisite.

Task and Process Versatility – Value Creation	
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Evidence in interview	Paraphrase
B: #00:20:22-4#	Flexible manufacturing methods are required because the manufactured items are different in terms of quantity; this can be a small volume, but also a large one. This must be implemented in order to operate with cost efficiency. In addition, green products should also be considered.
C: #00:16:29-7#	To handle varying customer needs, processes must be flexible to a certain degree, but the company's own processes should not be left aside completely in order to maintain quality.
H: #00:07:18-7#; #00:07:35-6#, #00:23:29-6#	Company is forced to balance price and flexibility for customers. To cope with the flexibility required in changing tasks, people must have the capabilities to realize changes under their own initiative. Changes are strongly anchored in individuals.

Sense and Accumulate Information on Customer Needs– Customer Element	
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Evidence in interview	Paraphrase
B: #00:28:31-3#	Being close to the customer through the sales channel as well as technology channels is essential. Sales are important in establishing the contract, but technology sets the boundary conditions; that's why this channel is important too.
B: #00:29:04-0#	A mutual understanding between the customer and the company is important, also during manufacturing in order to align possible changes.
G: #00:18:45-8#	Information on the customer must be available to everyone. This information sharing is guaranteed by establishing a CRM tool.
I: #00:30:43-1#	The annual customer survey provides information on topics that are important to the customer. The last survey revealed a topic with high priority for the customer. The company uses this information to actively prepare for these topics in the future.
K: #00:24:10-8#	Knowledge of customer requirements because of closeness to the customer through sales and after sales services; exchange of information with the customer.
L: #00:19:58-8#	Sales are important because information is gathered on problems through direct sales and on how the company can help in solving these problems. Flexibility is needed to grasp the requirements and develop solutions.
O: #00:35:31-1#	Customer satisfaction is measured to identify how satisfied customers are with the value proposition of the company and what can be improved. This is conducted in discussions with the customer and ensures that as much information as possible is gathered.

A.7 Appendix G – Paraphrases on Business Ecosystem Roles

Perceived Role of "Enabler as Promoter"

BE Participant	Layer Player	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Product development partnerships	Development of analog semiconductors by producing microchips, semiconductor wafers as well as testing and packaging.	Cooperation / Strategic Alliance	Enable the leverage of potential revenues by cooperating with Nvidia or Qualcomm in order to make a reference design. Customers are other companies that finally buy the chips. These cooperations are promotional and gain additional revenues.	A: #00:17:19#, #01:03:01#, #01:10:38#, #01:14:06#	Business Model Extension
Supplier	Top-supplier in the industry as solution provider for a product in the "cleaning area" in the semiconductor industry.	Cooperation	It is important to be ahead of the customer. Thus, the company seeks out developments in the industry and tries to anticipate and develop these future possibilities in order to actively make proposals to the customer. Partners are actively sought out for this; cooperations, for example with chemical suppliers, are established as a result.	F: #00:04:29-7#, #00:08:23-6#, #00:35:31-6#, #00:38:52-5#, #00:40:22-0#, #00:47:39-2#	Business Model Extension
Customers	Top-Supplier in the industry as solution provider for a product in the "cleaning area" in the semiconductor industry.	Cooperation	Large customers enable additional business if the company receives an order of several millions due to changes in the customers' investment plans.	F: #00:04:29-7#, #00:08:23-6#, #00:24:09-2#,	Business Model Extension
(Third party) Customers and other network partners	Extended workbench producing pharmaceutical products or dietary supplements for corporate group; solution provider for third-party customers. Ensure market supply.	Cooperation	Use partners as enabler for new business opportunities. Ideas received from customers which seemed unsolvable are not rejected; a proposal is made on how to find a different solution and also communicated to partners in the network. Added value for both the company and the customer.	H: #00:03:59-0#, #00:11:20-9#, #01:02:21-2#, #01:08:23-8#, #01:11:21-0#	Business Model Extension
Sales partner	Offering tools for the R&D engineer; also offering monitoring and surveillance of power electronics and power supply.	Cooperation	Sales partners are helpful because they have access to the market and the customer relationship is already established. Multiplication is achieved together easily. For example, when entering a new market, risks in terms of costs are divided between the company and the sales partner.	L: #00:04:16-4#, #00:32:48-0#, #00:34:32-4#	Business Model Extension

BE Participant	Layer Player/Orchestrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Complementors	Provider of intelligent transportation systems with the core business of toll collection systems. Steps taken in the value chain depend on the project.	Hierarchical (Leadership)	Mergers & Acquisitions are pursued to fill gaps in the product portfolio in order to offer a broader portfolio; this also has technological implications.	D: #00:06:58-2#, #01:14:33-3#, #01:07:20-8#	Business Model Extension
Several partners (e.g. competitors, research institutes)	Activities depend on the business model: development of products; construction business (working together with several sub-contractors); service business.	Cooperation; Co-opetition	Partners enable the introduction and positioning of complete new topics (e.g. smart metering or smart grid projects), which cannot be realized alone, through pilot projects. Cooperation projects with different partners are intensive.	E: #00:05:01-8#, #00:41:36-2#, #00:42:44-7#	Business Model Extension
Complementors	Manufacturing of insulation products in different sectors; in the energy sector as a supplier in the high-voltage, low-voltage and transformers sector.	Cooperation/ Strategic Alliances	Enable supply of the entire system through joint deliveries by the company and partner. A tested combination of the components provides value to the customer. The goal of actively seeking out such partnerships is the customer's value. Alliances with producers should enlarge the product portfolio.	G: #00:00:48-9#, #00:05:20-3#, #00:41:09-4#	Business Model Extension
Complementors	Classic plant construction in offering technologies in the field of renewable energies as EPC contractor; buying all the necessary equipment from sub-suppliers	Cooperation	Plants are developed together because more competencies are available together than alone; more than 40 projects have already been executed; this developed into a conglomerate; also, marketing is conducted together. Depending on the company's own workload, projects are realized together.	T: #00:01:23-4#, #00:47:39-3#, #00:50:36-7#, #00:53:51-3#, #00:54:40-3#	Business Model Extension
Research institutions	Classic plant construction in offering technologies in the field of renewable energies as EPC contractor; buying all the necessary equipment from sub-suppliers	Cooperation	The bio-fuel process was developed by the University of Graz, and implemented by the Graz University of Technology (main cooperation partner in R&D); this enabled the company to develop into a global leader. Additional institutes supported the company in offering the entire technology or provided support in scientific tests.	T: #00:01:23-4#, #00:05:12-5#, #00:44:40-5#, #00:51:00-0#	Business Model Extension

BE Participant	Layer Player/Integrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Technology partners	Special engineering by offering customer-oriented solutions; software development; planning and manufacturing of huge LED screens.	Cooperation	Enable realization of new LED technology and a new business field by actively searching for new partnerships because the required competencies in the field were not available. Need to convince new partners of the idea.	S: #00:00:52-1#, #00:20:29-2#, #00:25:29-3#	Business Model Extension

BE Participant	Orchestrator/Integrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Complementor	General contractor for special production systems; solution offered from a single source. Second area is idea to market; from an idea to the finished product.	Cooperation	In the laser welding technology area, the company bundles their competencies together with TRUMPF Lasertechnik to offer complete solutions for customers. Projects are best realized together, efficient in time and costs.	K: #00:09:17-3#, #00:12:58-4#, #00:33:17-4#, #00:38:08-2#	Business Model Extension
Technology/Research partner	General contractor for special production systems; solution offered from a single source. Second area is Ideas2market; from an idea to the finished product.	Cooperation	Cooperation partners enable business area "Ideas2market" because the company does not have such new technologies, developments or resources and therefore depends on cooperation partners. Searching for cooperation partners with experience in a particular market or product area to realize it together.	K: #00:09:17-3#, #00:12:58-4#, #00:33:41-6#, #00:34:20-3#	Business Model Extension
Corporate group	Development, manufacturing and sales of pharmaceutical and medical products for the critically ill.	Hierarchical (Followship)	Enables the manufacture of products with strategic importance for new markets due to the strategic decision of the corporate group to go east and go west. A challenge was the adjustment of production processes because, for example in the USA, the processes for manufacturing the product are completely different.	O: #00:06:53-0#, #00:55:02-2#	Business Model Extension

Perceived Role of "Enabler as Supporter"

BE Participant	Layer Player	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Suppliers	Offering tailor-made magnets in niche segments of the automotive industry as tier1 or tier2 supplier.	Cooperation/ Strategic Alliance	Supporting the production of new developments if the needed technologies are not part of the core business. A good understanding of the partners according to the requirements, what is needed, what is better and also more cost-effective is necessary.	B: #00:01:27-2#, #00:46:03-3#	Business Model Complementing
Development partner	Supplier in furniture industry; control systems for furniture in the office and home sector.	Cooperation	A local partner in prototype development provides resources if own resources are exhausted.	C: #00:00:08-9#, #00:04:55-2#, #00:36:42-5#	Business Model Scalability
Development/Productio n partners	Service provider in development and manufacturing customer products in medical and optical technology.	Cooperation	Supports the company in development and production by providing missing resources. This provides flexibility to the company and helps to scale the business model.	I: #00:05:11-0#, #00:06:14-0#, #00:21:55-4#	Business Model Scalability
Network of know-how provider (e.g. companies, institutes, universities)	Service provider in development and manufacturing customer products in medical and optical technology.	Cooperation	Support with know-how to ensure growth and the development of the company. Developing all the required know-how alone will take more time and the company won't be competitive.	I: #00:05:11-0#, #00:06:14-0#, #00:34:55-5#, #00:36:41-0#	Business Model Complementing
Suppliers	Operating as manufacturing service provider by manufacturing printed circuit boards; provision of additional services in engineering and optimizing the designs.	Cooperation	Helps the company to be on the top by providing machines for testing and further development. Working closely with suppliers when it comes to production for customer projects if this is not conducted internally.	Q: #00:03:18-1#, #00:34:43-1#, #00:39:15-4#	Business Model Complementing

BE Participant	Layer Player/Orchestrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Complementors	Activities depend on the business model: development of products; construction business (working together with several sub-contractors); service business.	Cooperation	Helps the company by providing competencies the company doesn't have or doesn't offer.	E: #00:05:01-8#, #00:42:57-0#	Business Model Complementing
Suppliers	Turnkey technology solutions for automatic warehouse logistics in several branches; use of partners as suppliers for technologies.	Cooperation/ Strategic Alliance	Development towards single sourcing and integration of suppliers into the product development process. The relationship to the supplier moved towards a partnership. New suppliers are sought out when new technologies are needed.	P: #00:04:54-6#, #00:43:13-9#, #00:45:31-8#, #00:46:02-6#, #00:49:51-6#	Business Model Complementing
Service Provider/ Consultants	Classic plant construction in offering technologies in the field of renewable energies as EPC contractor; buying all the necessary equipment from sub-suppliers	Cooperation	Supports the company in offering additional services in projects by providing the required know-how (e.g. establishing connections to banks, funds, investors)	T: #00:01:23-4#, #01:05:30-3#	Business Model Complementing

BE Participant	Orchestrator/Integrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Competitors	General contractor for special production systems; solution offered from a single source. Second area is idea to market; from an idea to the finished product.	Co-opetition	Enable business model scalability when required. Realization of the project would not be possible without the competitor. Partners involved are based locally.	K: #00:09:17-3#, #00:12:58-4#, #00:35:51-2#, #00:36:38-8#, #00:37:39-2#	Business Model Scalability
Logistic partners	Development, manufacturing and sales of pharmaceutical and medical products for the critically ill.	Subcontractor; Cooperation/ Strategic Alliance	Helps the company with logistics because structures and organizational functions are not available. The partnerships developed over time; the company was actively searching for strategic partners.	O: #00:06:53-0#, #00:48:07-4#, #00:49:30-9#	Business Model Complementing
Distributor	Development, manufacturing and sales of pharmaceutical and medical products for the critically ill.	Subcontractor/C ooperation	Helps the company with distribution of products when establishing business in a foreign country. Two possibilities: build own subsidiary or search for a local partner who is familiar with legal specifications in the country.	O: #00:06:53-0#, #00:12:11-4#	Business Model Complementing

BE Participant	Layer Player/Integrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
System configurator	Offers communication and information systems for safety-critical tasks (e.g. military and civil aviation security).	Cooperation	System configurator responsible for configuration and installation of the system directly at the customer's site. It is more cost-efficient if performed by partners.	M: #00:06:27-1#, #00:16:06-6#, #00:46:56-1#, #00:48:23-2#, #00:48:48-5#	Business Model Complementing
Know-how provider	Offers communication and information systems for safety-critical tasks (e.g. military and civil aviation security).	Subcontractor/C ooperation	Actively searching for new partnerships to obtain the required know-how not available in the company in order to complete the step towards being an integrator.	M: #00:06:27-1#, #00:16:06-6#, #00:53:27-5#	Business Model Complementing

Perceived Role as "Setting the Tone"					
BE Participant	Layer Player	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Associations/EU	Development of analog semiconductors by producing microchips, semiconductor wafer as well as testing and packaging.	Hierarchical Co-existence	If the EU decides not to support manufacturing in Europe, the company builds the plant somewhere else. As a countermeasure, the company is part of associations, industry representation or the EU and tries to influence topics in its own favour; in this case the importance of production in Europe.	A: #00:17:19#, #01:05:52#, #01:14:13#	Business Model Adjustment
Corporate group	Extended workbench producing and packaging of pharmaceutical products and dietary supplements for the corporate group; solution provider for third-party customers. Ensure market supply.	Hierarchical (Followship)	Decisions set by the corporate group lead to changes in the business model because the company has to react to these decisions.	H: #00:02:40-7#, #00:03:59-0#, #00:11:20-9#, #01:08:23-8#	Business Model Adjustment
BE Participant	Layer Player/Integrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Regulations, government	Development, production and approval of silage products. Service provider in the biotech branch.	Hierarchical; Co-existence	Laws, quality standards, law on foodstuffs and so on are considerable challenges and differ from one country to the next.	N: #00:06:55-5#, #00:08:20-1#, #00:44:44-6#	Business Model Adjustment
BE Participant	Orchestrator/Integrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Government	Development, manufacturing and sales of pharmaceutical and medical products for the critically ill.	Hierarchical; Co-existence	Health-care reforms or regulations implemented by the government constitute challenges and require adjustment of the business model. However, being part of different committees provides information on laws in advance; the company can be involved in discussions and can make statements on it.	O: #00:06:53-0#, #00:26:13-8#, #00:26:30-6#	Business Model Adjustment
BE Participant	Layer Player/Orchestrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Government	Provider of intelligent transportation systems with the core business of toll collection systems. Steps taken in the value chain depend on the project.	Hierarchical; Co-existence	Partners are traffic authorities, the Ministry of Transport and all organizations connected with this topic. Changes in the government or objections by the opposition can change the role in a specific project and influence the relationship with the partner.	D: #00:06:58-2#, #01:14:33-3#, #01:26:15-9#	Business Model Adjustment
Regulations, standardization bodies	Activities depending on the business model: development of products; construction business (working together with several sub-companies); service business.	Hierarchical; Co-existence	New regulations, legal conditions, deregulation in Europe, free energy market and other related topics provoke substantial changes.	E: #00:05:01-8#, #00:37:17-5#	Business Model Adjustment

Perceived Role of "Initiator as Direction Changer"					
BE Participant	Layer Player	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Customers	Development of analog semiconductors by producing microchips, semiconductor wafers as well as testing and packaging.	Cooperation	Rising customer demands through dynamic markets initiated changes in the company in order to fulfill customer needs. For example, investing in smartphone and tablet markets.	A: #00:07:36#,#00:17:19#,#01:08:06#	Business Model Extension
Customer	Supplier in furniture industry; control systems for furniture in the office and home sector.	Cooperation	Customer changed the business model by hiring people to promote the development of products on their own. This means that customers have a look at the value chain. This constitutes a challenge for the company because the customer plans to develop know-how by itself. This bears the threat of product and know-how reverse engineering. As a consequence, the company changed the business model as well.	C: #00:00:08-9#,#00:04:55-2#,#00:33:34-7#,#00:34:23-2#,#00:25:59-0#	Business Model Reinforcement
Customers	Supplier in furniture industry; control systems for furniture in the office and home sector.	Cooperation	Customer initiated the development of a new technology for a new product. This technology (LCD display) was new for the company, but became a new research focus there.	C: #00:00:08-9#,#00:04:55-2#,#00:33:34-7#,#00:34:23-2#,#00:41:41-2#	Business Model Extension
Customers	To supplier in the industry as solution provider for a product in the "cleaning area" in the semiconductor industry.	Cooperation	Changes in customer needs initiate changes of the company to realize the need. As the customer has top priority, all business processes are directed towards change.	F: #00:04:29-7#,#00:08:23-6#,#00:19:52-0#,#00:47:39-2#	Business Model Reinforcement
Competitors	Top supplier in the industry as solution provider for a product in the "cleaning area" in the semiconductor industry.	Competitive	The two biggest competitors merged, which presented them with several challenges. This situation is used to generate a competitive advantage.	F: #00:04:29-7#,#00:08:23-6#,#00:44:27-8#,#00:47:39-2#	Business Model Reinforcement
Customers	Offering tools for the R&D engineer; also offering the monitoring and surveillance of power electronics and power supply.	Cooperation	Customer problems, which nobody has solved so far, initiate changes or require slight adaptations to the business model. As a result, new customers can be reached.	L: #00:04:16-4#,#00:17:03-7#,#00:29:07-0#	Business Model Extension
Technology partners (Suppliers)	Offering tools for the R&D engineer; also offering the monitoring and surveillance of power electronics and power supply.	Cooperation	Technology partners influence the business model because the company is dependent on them as they own core competencies of the company. When changing such a partner, the business model changes as well.	L: #00:04:16-4#,#00:02:02-6#,#00:33:29-3#,#00:34:07-6#,#00:37:17-3#	Business Model Adjustment
Customers	Operating as manufacturing service provider by manufacturing printed circuit boards; provision of additional services in engineering and optimizing the designs.	Cooperative	Customer transforms the general market model (changes his business model) by outsourcing own core competencies, this changes the business model of the company in some segments too, but it depends on the level of integration in the BM of the customer; or the company is just a manufacturer.	Q: #00:03:18-1#,#00:39:15-4#,#00:50:20-6#	Business Model Extension
BE Participant	Layer Player/Integrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Customers	Development, production and approval of silage products. Service provider in the biotech branch.	Cooperation	Initiation of changes in the company and the business model through customer enquiries. This led to adaptations of the business model and establishment of the biotech area; the original BM was never abandoned.	N: #00:08:20-1#,#00:25:11-3#,#00:26:11-9#,#00:30:55-4#	Business Model Extension
Customers	Offers communication and information systems for safety-critical tasks (e.g. military and civil aviation security).	Cooperation	Customers initiate a change of the business model by the decision to move in the direction of standard IT.	M: #00:06:27-1#,#00:16:06-6#,#00:34:03-7#,#00:44:39-4#,#00:47:42-2#,#00:55:26-3#	Business Model Adjustment
Customers/Research partner	Offers communication and information systems for safety-critical tasks (e.g. military and civil aviation security).	Cooperation	Together with customers and other industry partners the company is working on development of the future market in 2030 and how they can achieve goals together. Thus, products are developed to fit the new standards and to fit in with other products.	M: #00:06:27-1#,#00:16:06-6#,#00:45:45-5#,#00:49:13-4#	Business Model Reinforcement
BE Participant	Orchestrator/Integrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Customers	Special engineering by offering customer-oriented special solutions; software development; planning and manufacturing of huge LED screens.	Cooperation	The customer sets the direction of the company; if the customer goes in a specific technological direction (e.g. headlight manufacturer follows LED technology), the company can follow or has to follow.	S: #00:00:52-1#,#00:11:47-2#,#00:20:29-2#	Business Model Extension
Customers	General contractor for special production systems; solution offered from a single source. The second area is Ideas2market; from an idea to the finished product.	Cooperation	The globalization of customers provides a chance for the company to follow customers, especially if going east. This is an opportunity for the business model.	K: #00:09:17-3#,#00:12:58-4#,#00:30:18-4#	Business Model Extension
BE Participant	Layer Player/Orchestrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Customers	Activities depending on the Business Model: development of products; construction business (working together with several sub-contractors); service business.	Cooperation	Customers change their business model by concentrating on core competencies. They do not want to deal with technical engineering, services and so on. If the new emerging business seems attractive for the company, it will be followed.	E: #00:05:01-8#,#00:13:02-3#,#00:15:43-6#,#00:49:51-6#	Business Model Extension
Customers	Turnkey technology solutions for automatic warehouse logistics in several branches; use of partners as suppliers for technologies.	Cooperation/Strategic Alliance	Customer determines the direction of the company. The company is part in the organization of many customers and optimizes, further develops and drives the customer's business.	P: #00:04:54-6#,#00:42:19-5#,#00:45:31-8#,#00:46:02-6#	Business Model Adjustment

Perceived Role of "Initiator as Information Provider"					
BE Participant	Layer Player	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Service provider	Offering tailor-made magnets in niche segments of the automotive industry as tier-1 or tier-2 supplier.	Cooperation	Service providers are good at anticipating developments in the market. The company has the opportunity to draw better conclusions from this.	B: #00:01:27-2#, #00:39:51-1#, #00:41:04-2#,	Business Model Reinforcement
Competitors and customers	Supplier in furniture industry; control systems for furniture in the office and home sector.	Competitive Cooperation	Customers and competitors mainly influence the business model; the process and all actions on the market. How the company acts on the market initiates actions for the processes. What should be achieved on the market directs what happens in the background.	C: #00:00:08-9#, #00:04:55-2#, #00:33:34-7#, #00:34:23-2#, #00:45:11-9#, #00:45:24-8#	Business Model Reinforcement
BE Participant	Orchestrator/Integrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Cluster/Information network	General contractor for special production systems; solution offered from a single source. Second area is idea to market; from an idea to the finished product.	Co-existence	Information and trends from different industry sectors and special forums lead to decisions as to whether an industry suits the business model or not and whether a leading position is possible. If not, further information is gathered to stay informed and deduce trends.	K: #00:09:17-3#, #00:12:58-4#, #00:41:58-8#, #00:43:22-0#, #00:46:57-4#	Business Model Reinforcement
BE Participant	Layer Player/Orchestrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Standardization bodies; further companies	Activities depending on the Business Model: development of products; construction business (working together with several sub-contractors); service business.	Co-existence	Company is part of standardization bodies, committees and so on dealing with future technical topics. The goal is information exchange and influencing certain issues. Topics are discussed and prepared before they appear on the market. Participants are also organizations in the energy market as well as customers.	E: #00:05:01-8#, #00:39:19-7#	Business Model Reinforcement
Customers	Manufacturing of insulation products in different sectors; in the energy sector as a supplier in the high-voltage, low-voltage and transformers area.	Cooperation	Information exchange to reduce time-to-market is the largest goal of cooperation with large customers. Thus, customer relationships changed from classic customer-supplier relationships towards partnership cooperation.	G: #00:00:48-9#, #00:05:20-3#, #00:52:42-9#	Business Model Reinforcement
Suppliers/Complementors	Manufacturing of insulation products in different sectors; in the energy sector as a supplier in the high-voltage, low-voltage and transformers area.	Cooperation/Strategic Alliance	Information provided by partners influences the business model; this is already seen as added value for the customers. Actively searching for new partnerships because they shorten time for development or to transfer requirements of the company backwards and forwards in the value chain; in addition, information exchange and achieving the end result takes place much faster.	G: #00:00:48-9#, #00:05:20-3#, #00:10:51-7#, #00:48:24-8#	Business Model Reinforcement
Futurologists, branch experts	Turnkey technology solutions for automatic warehouse logistics in several branches; use of partners as suppliers for technologies.	Co-existence	Gather information on how the world will change in the future by inviting futurologists and branch experts. Identified changes lead to rethinking and changing the business model.	P: #00:04:54-6#, #00:15:16-4#, #00:33:16-5#, #00:46:02-6#	Business Model Reinforcement
Customers	Classic plant construction in offering technologies in the field of renewable energies as EPC-contractor; buying all the necessary equipment from sub-suppliers.	Cooperation	Customer events where customers are invited to strengthen the relationship and exchange information to obtain an idea of needs.	T: #00:01:23-4#, #00:32:07-0#, #00:52:12-0#	Business Model Reinforcement
BE Participant	Layer Player/Orchestrator/Integrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Technology partner	Business in drive technology, system technology, electronics systems, plant engineering, service and maintenance.	Cooperation	Technology partner, dealing with innovative technologies, send out an impulse for changes.	R: #00:04:34-5#, #00:56:20-0#, #01:03:51-4#	Business Model Reinforcement
Close supplier ("Stammhaus")	Business in drive technology, system technology, electronics systems, plant engineering, service and maintenance.	Subcontractor; Cooperation	Information from close suppliers initiates consideration of the business model and possible changes to it. This may not be interesting for the business unit receiving the information, but for another business unit in the company.	R: #00:04:34-5#, #01:03:59-4#	Business Model Reinforcement
BE Participant	Integrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Subsidiaries	High-technology measurement systems for the laboratory and process fields.	Hierarchical (Leadership)	The subsidiaries provide information on the market or future product developments.	J: #00:02:49-7#, #00:29:14-0#, #00:34:29-4#	Business Model Reinforcement

Perceived Role as "Learning Partner"					
BE Participant	Layer Player	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Customers	Offering tailor-made magnets in niche segments of the automotive industry as tier-1 or tier-2 supplier.	Cooperation/ Strategic Alliance	Learn from the customers about their issues on powertrains, what requirements exist on the products or what the advantages of magnetism can solve. This requires constant customer contact.	B: #00:01:27-2#, #00:12:35-3#	Business Model Reinforcement
Customers	Supplier in furniture industry; control systems for furniture in the office and home sector.	Cooperation	Being present at the customer's facility; learning through face-to-face discussions. Real innovations only happen through intensive cooperation with the customer.	C: #00:00:08-9#, #00:04:55-2#, #00:33:34-7#, #00:34:23-2#, #00:35:40-0#	Business Model Reinforcement
Competitors/Similar Industries	Top supplier in the industry as solution provider for a product in the "cleaning area" in the semiconductor industry.	Coopetition; Co-existence	Benchmarking with competitors or companies in similar industries to learn and improve. This is achieved through information exchange with companies in similar industries to identify similar topics and problems, what can be conducted jointly and making use of symbioses.	F: #00:04:29-7#, #00:08:23-6#, #00:41:18-4#, #00:47:39-2#	Business Model Reinforcement
Customers	Extended workbench producing pharmaceutical products or dietary supplements for corporate group; solution provider for third-party customers. Ensure market supply.	Cooperation	Learning from third-party customers how to act differently in order to secure new business.	H: #00:03:59-0#, #00:11:20-9#, #01:02:21-2#, #01:08:23-8#, #01:12:41-9#	Business Model Reinforcement
Cluster/Associations	Extended workbench producing pharmaceutical products or dietary supplements for corporate group; solution provider for third-party customers. Ensure market supply.	Co-existence	Networks are important to gain additional information, exchange best practices, talk about legal topics and so on.	H: #00:03:59-0#, #00:11:20-9#, #00:57:06-1#, #01:08:23-8#	Business Model Reinforcement
BE Participant	Layer Player/Orchestrator	Relationship	Paraphrased Effects on Business Model	Evidence in the Interview	Business Model Changeability
Research institutions	Provider of intelligent transportation systems with the core business of toll collection systems. Steps taken in the value chain depend on the project.	Cooperation	A growth program together with research institutions was started in order to have a targeted view of business models, business segments and so on. These topic fields are far removed from traditional business. A successful subsidiary, offering smart meters, was already developed from this.	D: #00:06:58-2#, #01:14:33-3#, #00:59:04-8#	Business Model Extension
Service cluster	Turnkey technology solutions for automatic warehouse logistics in several branches; use of partners as suppliers for technologies.	Co-existence	Working together with companies not in the same branch, but having the same interests. Information exchange on particular topics in working groups; also projects result therefrom.	P: #00:04:54-6#, #00:46:02-6#, #00:53:49-6#	Business Model Reinforcement