New Perspective and Insights on Business Model Innovation using Systems Thinking and Action Case Studies

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SUMMARY

In recent years, entire industries and their participants have been affected by disruptive technologies, resulting in dramatic market changes and challenges to firm's business logic and thus their business models (BMs). Firms from mature industries are increasingly realizing that BMs that worked successfully for years have become insufficient to stay on track in today's "move fast and break things" economy. Firms must scrutinize the core logic that informs how they do business, which means exploring novel ways to engage customers and get them to pay. This can lead to a complete renewal of existing BMs or innovating completely new BMs.

BMs have emerged as a popular object of research within the last decade. Despite the popularity of the BM, the theoretical and empirical foundation underlying the concept is still weak. In particular, the innovation process for BMs has been developed and implemented in firms, but understanding of the mechanisms behind it is still lacking. Business model innovation (BMI) is a complex and challenging management task that requires more than just novel ideas. Systematic studies to generate a better understanding of BMI and support incumbents with appropriate concepts to improve BMI development are in short supply. Further, there is a lack of knowledge about appropriate research practices for studying BMI and generating valid data sets in order to meet expectations in both practice and academia.

This paper-based dissertation aims to contribute to research practice in the field of BM and BMI and foster better understanding of the BM concept and BMI processes in incumbent firms from mature industries. The overall dissertation presents three main results. The first result is a new perspective, or the systems thinking view, on the BM and BMI. With the systems thinking view, the fuzzy BM concept is clearly structured and a BMI framework is proposed. The second result is a new research strategy for studying BMI. After analyzing current research practice in the areas of BMs and BMI, it is obvious that there is a need for better research on BMs and BMI in terms of accuracy, transparency, and practical orientation. Thus, the action case study approach combined with abductive methodology is proposed and proven in the research setting of this thesis. The third result stems from three action case studies in incumbent firms from mature industries employed to study how BMI

occurs in practice. The new insights and knowledge gained from the action case studies help to explain BMI in such industries and increase understanding of the core of these processes.

By studying these issues, the articles complied in this thesis contribute conceptually and empirically to the recently consolidated but still increasing literature on the BM and BMI. The conclusions and implications made are intended to foster further research and improve managerial practices for achieving BMI in a dramatically changing business environment.

INTRODUCTION

1. Situation and problem statement

In the 20th century, the dominance of firms in a market was based mainly on scale and large resources (George & Bock 2011). In contrast, firm success in the 21st century is influenced less by arguments about economies of scale in production and distribution (McQuivey 2013; Jin Zhang *et al.* 2015). It has become more important to explore novel ways of engaging customers and getting them to pay (Baden-Fuller & Mangematin 2015). This is the age of the customer, and customers alone dominate the purpose of business (e.g., Morris *et al.* 2005; Johnson *et al.* 2008). Today's customers are no longer passive recipients of products or services and consumers of technologies (Demil *et al.* 2015). They have become increasingly involved in creating solutions for their perceived needs (Teece 2010). Drucker claimed more than 60 years ago that the purpose of a business is to create customers and "it is only the customer who determines what business is" (Drucker 1954). Several disruptive firms (e.g., Amazon) that use new digital tools and platforms to get closer to customers and engage them more deeply have quickly adapted this customer-centered perspective. These firms dominate the customer interface and are truly changing the customer experience (Westerman *et al.* 2014) whereby incumbents have become nothing more than suppliers of products and services (i.e., infrastructure). These disrupters are competitors that can come from anywhere and are no longer large firms exclusively. In principle, each person with a computer and Internet access can become an inventor and entrepreneur in the digital era (Anderson 2013; Westerman *et al.* 2014). Setting up a digital business and attacking the business of incumbent firms as well as changing the game in established markets are easier and cheaper than ever before. New technology innovations such as mobile Internet, sensors, location-based technology, and the overall digitization trend are allowing new things to happen and changing the way humans live and work and, accordingly, how firms interact with their customers (e.g., Yoo *et al.* 2012; Scoble *et al.* 2014). The progress and convergence of several technologies are reshaping traditional markets and industries (Gambardella & Torrisi 1998). The combination of increasing customer-centric view and new disruptive technologies is mainly driving this dramatic

transformation (Dobbs *et al.* 2015).

Accordingly, the progression of technology (Pfeiffer 1971; Brynjolfsson & McAfee 2011) and the new customer-centric view concentrating on value (Amit & Zott 2015) are the main drivers of change. These developments force firms, especially incumbents, to fundamentally rethink the way they do business, particularly the ways in which they interact with customers and how they generate and deliver value, which is always influenced by new technology developments (Amit & Zott 2001, 2015). It is at this precise point where business models (BMs) come into play. Thinking about their BM offers firms a promising way to renew their business logic and respond by innovating their BM in the direction of upcoming and sometimes dramatic changes (Frankenberger *et al.* 2013). The BM perspective shifts attention towards what happens inside and beyond firms and market boundaries and re-emphasizes the relationship between the firms and their customers (Teece 2010). Incumbents in particular are unaccustomed to such a holistic and customer-centric view and, for the majority, the shift was unexpected (Bohnsack *et al.* 2014). Siemens recently realized it must involve customers as early as possible in the business development process instead of focusing on, for example, improving the efficiency of a large turbine by a few percent.[1] Johannes Teyssen, CEO of E.ON, recently decided to intensively rethink his firm's BM from a customer perspective.[2] It is somewhat surprising that global leaders in industrial manufacturing (Siemens) and energy (E.ON) are fairly late in realizing that the age of the customer and thus the time to renew existing BMs has already begun. Mature industries are generally late adopters of digital technologies, which determine the BM and manner of customer interaction when adopted. About 40% of incumbent firms cite "lack of urgency" as a major obstacle to digital transformation (Fitzgerald *et al.* 2013). For management in industries such as manufacturing and energy, it is difficult to determine how to begin the process of (digital) transformation and thus how to renew the BM (Fæste *et al.* 2015).

Renewing or innovating a BM is a complex and risky endeavour for incumbents because they often need to move outside the comfort zone of their core business (Dewald & Bowen 2010; Klang & Hacklin 2013; Sabatier *et al.* 2012) and transform their BM more rapidly and

[1] Handelsblatt 03. July 2015, Nr. 125, p. 23.
[2] Handelsblatt 11. September 2015, Nr. 175, p. 8-9

frequently than in the past (Doz & Kosonen 2010). They must often run two or more BMs in parallel (McQuillan & Sharkey Scott 2015) and must potentially manage the process of cannibalization between competing BMs within the company (Velu & Stiles 2013). Furthermore, renewing or innovating BMs requires new ways of thinking focused on BMs as holistic systems composed of elements, linkages between these elements, and dynamics (Afuah & Tucci 2001; Casadesus-Masanell & Heilbron 2015; Zott & Amit 2010).

The most common understanding of and the leading meaning of the term BM as it is used in this dissertation is a systematic description of the logic of a firm, the way it operates, and how it creates and captures value (e.g., Brea-Solís *et al.* 2015). In more detail and from an aggregated point of view, a BM has three main components (Demil & Lecocq 2010; Morris *et al.* 2005; Morris *et al.* 2013; Teece 2010; Zott *et al.* 2011): (1) value proposition – who are the customers and what are their problems (i.e., what are the opportunity), with a focus on "being different" (strategic model); (2) value creation – how is value created and delivered (i.e., resources and capabilities) and how is the customer engaged, with a focus on "being concentrated" (operation model); and (3) value capture – who is actually paying and what is the logic of profit generation, with a focus on "being better" (economic model). All three components determine how a firm does business (Magretta 2002), particularly regarding the customer-firm interface (Aversa *et al.* 2015a). The BM and its components are the source of competitive advantage and can independently and jointly enhance strategic position (Casadesus-Masanell & Ricart 2010; Zott & Amit 2008). Since the early days of academic research on BM, the BM debate has been tightly intertwined with technology and innovation (Amit & Zott 2001; Baden-Fuller & Haefliger 2013; Chesbrough 2010). In the academic literature, BMs are applied for three main reasons (Lambert & Davidson 2013): (1) enterprise classification; (2) explanation of firm performance; and (3) business model innovation (BMI).

When examining the literature about the BM as a concept (e.g., Baden-Fuller & Morgan 2010), it slowly becomes apparent what the BM is and what it is not (DaSilva & Trkman 2013). In fact, BM can describe and explain any type of business enterprise: a global corporation, a technology start-up, a local restaurant, a soccer club, or a government institution. It is clear that BMs are never 100% correct and there is no "ideal" BM type. As Einstein once said, "All models are wrong, but some are useful". Thus, a firm's BM is not

set in stone but instead evolves over time (Chesbrough & Rosenbloom 2002; Mitchell & Bruckner Coles 2004). However, there remain more questions than answers regarding BMs and research is still emerging. In recent years, three underlying research streams, which simultaneously represent three different perspectives on the BM (i.e., BM change and BMI), have evolved (see Table 1). These categories[3] represent meaningful consensus about BM views (Martins *et al.* 2015) shared by actors. In other words, they demonstrate various ways of thinking about BM and different levels of perception.

Table 1 Different research streams and related views

Research stream category (theoretical perspective)	Main actors (authors and publications)	View on BM and BM change (BMI) (based on Martins *et al.* 2015, who determined theoretical schools from strategy research)
Activity system – instrumental, material Configuration of firms' activity systems (boundary-spanning nature, interaction with environment)	(Afuah & Tucci 2001; Zott & Amit 2008, 2010)	**Rational positioning view** (system view, including causality) Sees BM as a purposefully designed system of activities (Zott & Amit 2010) (i.e., the result of external changes (shocks)) or mobilization of new technologies (e.g., Gambardella & McGahan 2010) BM change represents a search for a new optimal design that repositions a firm in response to changing interdependencies caused by exogenous environmental or ecosystem changes

[3] For more details about categorization in research, see Durand and Paolella (2013)

Objective (real) entity Describes what firms do and the way they operate	(Demil & Lecocq 2010; McGrath 2010; Sosna *et al.* 2010)	**Evolutionary view** Focuses on the role of experimentation and learning in the generation and change of BM BM development is an initial experiment followed by constant fine-tuning based on trial-and-error planning (Sosna *et al.* 2010) Changes in BM are generated by external uncertainty and are not the result of a master plan Incremental process of refining BMs to improve fit
Cognitive – mental model BMs as models and cognition – how BMs are used by managers	(Chesbrough & Rosenbloom 2002; Baden-Fuller & Morgan 2010; Baden-Fuller & Haefliger 2013; Teece 2010)	**Cognitive view** Conceptualizing the BM as a cognitive instrument that represents the activity system (rational positioning view) (Aversa *et al.* 2015a) Reflects managerial mental models, which describe what managers think they are doing "BMs stand as cognitive structures providing a theory of how to set boundaries to the firm, of how to create value, and how to organize its internal structure and governance" (Doz & Kosonen 2010, p. 371)

The activity-system research stream (rational positioning view) and the cognitive research stream represent the two poles of BM research. The activity-system stream views the BM as a system of activities (material aspects such as strategy, operations, and network activities are highlighted) and the cognitive stream views the BM as a cognitive representation of the

activity system (cognitive aspects, including the meaning and structure that managers retain about BM components) (Furnari 2015). A cognitive BM is typically encoded in text and visual or physical objects that managers use to articulate the BM (Doganova & Eyquem-Renault 2009). The evolutionary view sees the BM as an objective real entity and is located between these poles. This view responds to specific problems or opportunity (similar to the rational positioning view) but the primary focus is on the role of experimentation and learning for the development of an appropriate BM (McGrath 2010). It also recognizes that managerial cognition is a potential source of an initial BM (Sosna *et al.* 2010). The evolutionary view uses a trail-and-error approach to search for incremental modifications that improve the activity system.

These three theoretical perspectives are important because they provide relevant insights and shed light on how to distinguish and categorize the existing literature. Actors or research groups can use these categories to navigate the emerging research field and clearly assign membership to a single category or multiple categories. These three perspectives have alternated in recent years. In the early stage of BM research until 2010, the activity-system view dominated the discussion (Amit & Zott 2001; Zott & Amit 2008, 2010). After the Long Range Planning special issue in 2010, the evolutionary path emerged (Demil & Lecocq 2010; McGrath 2010; Sosna *et al.* 2010) because firms became interested in the field but were searching for practicable solutions (i.e., through experimentation and trial and error). Realizing that working with BMs is a difficult task, the cognitive (model) perspective received increasing attention. In 2015, several BM research publications focused on or addressed the cognitive perspective (e.g., Baden-Fuller & Mangematin 2015; Demil *et al.* 2015) and examined the BM as a cognitive device, reinforcing the idea of "business models as models"(Baden-Fuller & Morgan 2010).

This categorization of existing research streams and views represents a first attempt to provide a meta-view on and locate the dissertation within this research field. Since these research streams and views emerged only within the last years, this thesis is not clearly assignable to a single view. Nevertheless, given the systemic nature of this dissertation and use of the definition of BMs as systems of "interdependent organizational activities centred on a focal firm" (Zott & Amit 2010,p. 217) composed of the elements and linkages between these", the thesis is located primarily in the first research stream. However, considering

BMI as a new and thus experimental procedure for incumbents and model theory as a fundamental perception, the dissertation also belongs to parts of the other research streams. Articles I and II address this in more detail[4] and contribute mainly to the activity-system stream. Articles III and IV are more general and address the research methodology, which is relevant for all three streams. The final article follow the first stream but also contributes to the objective-entity stream by examining new insights into the process of BMI and thus how firms operate with BM as a real entity.

The different research streams approaching BMs from different perspectives reflect three areas in which the BM concept differs from other management concepts, particularly the strategy concept.[5] First, strategy looks inside the firm and BM looks at the firm-customer interface, which is a new focus (i.e., level of analysis). Second, every activity within the BM concept begins with thinking about customers first instead of the competition, market, or resources (Demil & Lecocq 2010). Third, existing strategic management concepts such as the value chain only answer questions regarding value creation (i.e., what activity a firm should perform and what is the best configuration) (Amit & Zott 2001)) and omit value proposition and value capture. The shift of attention away from firm-internal matters towards what happens beyond its boundaries (Baden-Fuller & Mangematin 2015) as well as the increasing importance of the relationship between the firm and its customers becomes obvious (see especially Teece 2010). Nevertheless, BM and strategy are complementary yet distinct concepts. The BM is a reflection of a firm's realized strategy (Casadesus-Masanell & Ricart 2010) and is thus needed for strategic deployment (Halecker & Hartmann 2014). Furthermore, BMs enable a more intensive entrepreneurial view on strategy and are located at the intersection of strategy and entrepreneurship research (Demil *et al.* 2015).

Managers from incumbent firms face several challenges from exogenous environmental changes (as described above) and need to find the right answers. One of the most promising answers to such changes is BMI, which represents the conscious renewal of a firm's business logic (Chesbrough 2010; Schneider *et al.* 2013) and has also been described

[4] More details about each article are provided in the last section of the introduction.
[5] The latest summarized findings are shown here. More details and proper analysis of strategy and business models can be found in article I.

as strategic innovation (Markides 2006). BMI refers to the search for new ways to create and capture value for stakeholders (Amit & Zott 2001; Magretta 2002; Teece 2010). However, BMI activities often lead to a strategic dilemma for incumbents (similar to Christensen's technology-oriented innovator's dilemma Christensen 1997) about whether to explore new (disruptive) BMs or exploit existing BMs that have provided past success and continue to provide current success (Markides 2006). This orchestration and integration of both new and existing BMs to overcome inertia and path dependencies is characterized by ambidexterity, which is the core of dynamic capabilities (O'Reilly & Tushman 2008; Teece & Pisano 1994). Ambidexterity highlights the fact that BMI is a complex management task.

To foster better understanding of the relevance of these facts and ensure their practical significance, the next section focuses on current examples from different industries to explain this strategic dilemma in the context of BM and BMI. Considering ambidexterity and the increasing importance of an innovative BM to maintain or disrupt a competitive market position (Sosna *et al.* 2010), firms' management teams have four general answers (i.e., strategic options) for responding to disruptions (Dewald & Bowen 2010; Markides 2008; Osiyevskyy & Dewald 2015). The first option is to defend the status quo and stick with an existing BM. Firms that choose this option are mainly from mature industries and ignore innovation by saying, "it is not our business". The second option is to exploit existing business and strengthen the BM without adopting a radical or disruptive approach. A recent study showed that a majority of incumbents (80%) are already engaged in or are planning to exploit existing BMs but not create a disruptive BM because they are financially unattractive (Osiyevskyy & Dewald 2015). The third option is to practice pure exploration and disrupt the firm and the market to "attack-back" upcoming disruptions. Firms taking this option fully embrace an innovation approach and attempt to scale it up. The fourth and last option is to adapt innovation and play both games (exploration and exploitation) at once. This requires the integration of multiple BMs in the same business or creation of spin-offs to outsource business in separate units. Figure 1 shows different

incumbent firms as examples for each of the described options.[6]

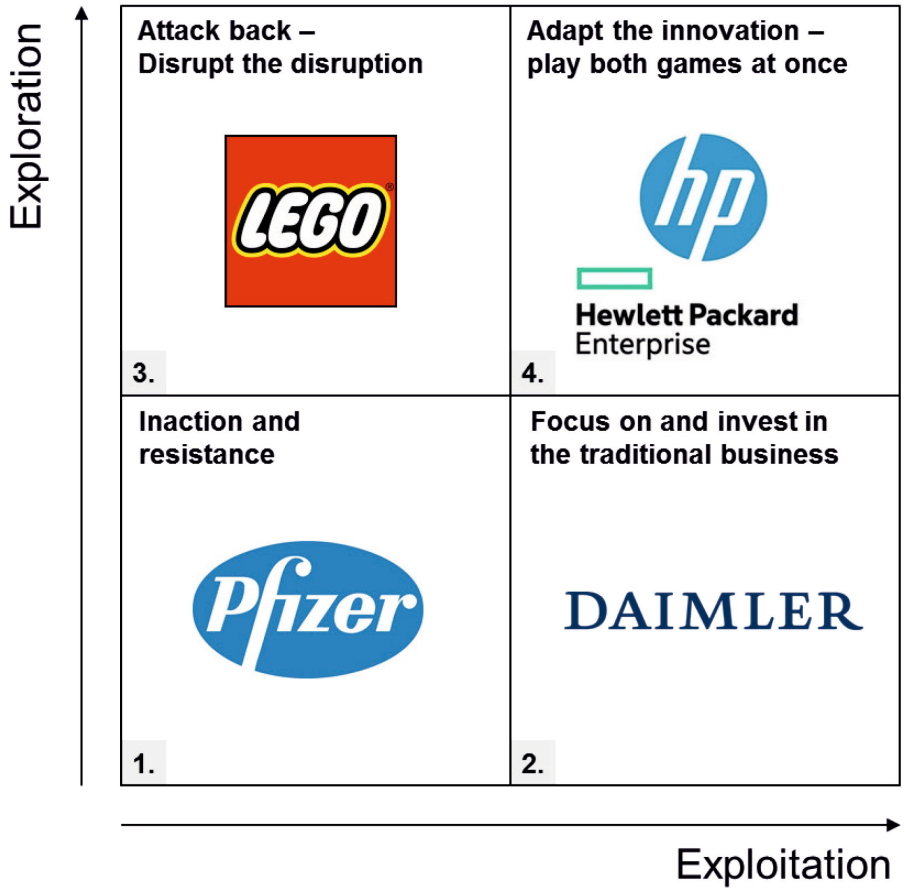

Figure 1: Options of incumbent firm responses to external changes i.e. disruptions (Source: Author's figure)

Option 1: The healthcare market and, in this case, the large pharmaceutical firm Pfizer present an interesting example of how rapidly established markets are changing without substantial BMI activity by existing market players (i.e., leaders). There are several disruptions (i.e., "game changers") that have had dramatically impacts on the traditional "big-pharma" BM: geo-medicine, sensor on pills, wearables, the Quantified Self movement, biohacking, citizen scientists, and personal genetic testing to name just a few. Many start-ups have adopted these technologies and trends to attack incumbent firms such as Pfizer in their core markets. Firms such as Caterna[7] focus on software for medical service and adopt a digital therapy approach. Another innovative BM uses location based data to alter

[6] Research on the selected options is not obvious, especially because the identification of appropriate cases for options 3 and 4 is difficult due to the fact that few cases exist thus far.
[7] More details on www.caterna.de

asthma sufferer's patterns by warning them to avoid certain areas. "Preventing attacks by avoiding the place" is the motto of Propeller Health,[8] a firm that is addressing a market with total revenue of $50 billion. These two examples obviously play quite small roles within the huge pharmaceutical market. Nevertheless, they have quickly adopted new technologies and built innovative BM around theses to create enormous potential in a changing market. Conversely, Pfizer is sticking to the existing BM and investing heavily in traditional R&D to find new blockbuster drugs and defend the status quo.

Option 2: Daimler is a premium market leader in the German automotive sector and exploits the existing BM by investing heavily in traditional driving technologies (i.e., combustion engine). The company invented products similar to those of other German car manufacturers such as BMW or Volkswagen mainly around traditional driving technologies (Hartmann & Halecker 2015) to supposedly defend their market position against new entrants (e.g., Tesla and Faraday Future). In addition, Daimler recently began investing money in alternative mobility concepts to test other innovation pathways and strengthen their existing BM. Parallel to the successful Car2Go concept Daimler has implemented other interesting concepts into market (i.e., Moovel, Space Cowboys, and MBTravel). These concepts are in part disruptive but (so far) have had only minimal financial impact compared to existing business and thus no real explorative character.

Option 3: Toy company LEGO has undergone a dramatic transformation in the last two decades. It tripled its production offering in the late 1990s and early 2000s after dramatic sales decreases. Manufacturing and delivery costs have inflated while revenue has not increased. Moreover, with the rise in popularity of video and computer games, children have begun giving up LEGOs in favour or more sophisticated toys at an earlier stage, reducing the company's potential market. In 2004, the company faced bankruptcy and a new management team revised the strategy, sold everything that was not vital to the core product, and began again from brick one. They created a more structured disruptive thinking culture and set the goal of LEGO becoming the best company for family products. Management gave everyone from the sales force to the headquarters staff the capability to explore new avenues for growth. The company developed new and relatively inexpensive

[8] More details on www.propellerhealth.com

methods of interacting with customers (e.g., LEGO designing contests) and thus began to pay more attention to its relationship with customers. Through practicing pure exploration, LEGO disrupted the firm by radically renewing the old BM. Since then, LEGO has posted phenomenal growth at a time when competitors such as Hasbro and Mattel are stagnating.

Option 4: Driven by enormous changes in computing and IT infrastructure Hewlett Packard (HP) has been forced to renew their existing business model and adopt disruptive innovation (e.g., cloud computing or mobile devices). Recently, HP decided to split their main BM into two separate BMs. HP Inc. will remain close to the traditional BM, which is focused on products that include desktop PCs, screens, and printer. Hewlett Packard Enterprise (HPE) focuses on emerging trends such as cloud computing and the Internet of Things (IoT) and offers hybrid infrastructure management solution as well as analysis of IoT data for enterprises. Both BMs complement each other and are based on an joint 75-year-old company history. Whether the transformation will be successful remains to be seen.

Considering these examples, it is obvious that incumbents, especially those from mature industries (e.g., pharmaceuticals), tend to defend the status quo rather than renew or innovate their BMs. This is surprising because, on one hand, things are changing dramatically and, on the other hand, firms from mature industries have a great need to catch up in regard to BMI (Andries & Debackere 2007; Sandström & Björk 2010). Accordingly, the strategic decision to break up inaction and resistance becomes highly necessary. However, incumbents in mature industries have deficient capabilities to explore completely new business and are unable to simultaneously manage exploration and exploitation (O'Connor & Rice 2013). These firms need to stay on track and exploit existing business due to large assets and strict regulatory environments that are unable to be quickly adapted. However, due to the main trigger—disruptive new technologies and new active customers—firms need to explore and create BMs as new systems of components (Zott & Amit 2010) (option 4) and linkages with existing BMs regarding new interdependencies within the business ecosystem (Martins *et al.* 2015). Each move from one option to another represents a significant effort because it means a renewal of the existing BM and thus the overall structure of the firm. When discussing strategic options regarding BM renewal and BMI, it is necessary to link these ideas with the literature. Cavalcante

distinguished four different types of change to existing BMs for steering strategic innovation (i.e., BMI) activities and the associated implications for BMs (Cavalcante *et al.* 2011): BM creation, extension, revision, and termination. Creation implies conceptualizing and implementing a new BM (mainly options 3 and 4); extension implies expanding the business with minimal effects to existing BMs (mainly option 2); revision implies existing BMs are subject to change (mainly option 4); and termination implies closing the existing BM and concentrating on a completely new one (mainly option 3). Within this dissertation, the focus is on conceptualizing and implementing a new BM (mainly options 3 and 4) as a vehicle for a radical corporate transformation and renewal (Demil & Lecocq 2010; Johnson *et al.* 2008; Sosna *et al.* 2010). This implies a renewal of exiting BMs in response to environmental changes (Chesbrough 2010) focused mainly on rethinking the value proposition and redefining the customer-firm interface, which has a substantial effect on the long-term success of a firm (Wirtz *et al.* 2010).

To underpin the urgency of BM renewal and the need for innovative BM for incumbents from mature industries, examining previously disrupted industries is helpful. AirBnB is an excellent example of how a new BM combined with an Internet-technology-based platform can break up a traditional mature industry, in this case, hospitality. The company was founded in 2008 and by mid-2015 hosted more overnight guests than the entire Hilton group. More generally, new Internet-based firms driven by new technologies are disrupting existing industries and proving true the motto, “Move fast and break things”. No industry has remained untouched. Another major disruption or, in other words, an industry “core meltdown” occurred in the music industry in the late 1990s. Initially driven by Napster and continued by iTunes and, more recently, streaming services (e.g., Spotify or iRadio), the music industry has experienced dramatic changes. New entrants are focusing on value for the customer and attempting to dominate the customer interface, which is downgrading incumbents to suppliers. New BMs combined with new technologies are shaking up the hundred-year-old institution. However, new BMs are often the source and not the outcome of industry change (Martins *et al.* 2015). It is also apparent that when the underlying technology changes, the established logic of existing BMs must also change (Teece 2010: 188).

As demonstrated, the triggers for renewing or innovating BMs are often different, but the

mechanisms of BMI are quite similar (Martins *et al.* 2015). In reality, the BMI process is a unique and recursive interaction between conceptualization and implementation (Demil *et al.* 2015, p. 6) and can strengthen firms' competitive advantage (Markides 2008). In addition, there is a consensus that BMI supports firms' growth (Chesbrough 2010; Johnson 2010; George & Bock 2011) and success (Achtenhagen *et al.* 2013). Firms need to be strategically agile to engage in the renewal process (Doz & Kosonen 2010) and should have a degree of openness (i.e., Open Innovation) regarding collaboration and sharing value creation (Chesbrough 2006). Recent studies have revealed that the success of a new BM depends not only its design (i.e., its levers and how they relate to each other) but also its implementation (how the levers are pulled such as through governance) (Brea-Solís *et al.* 2015). Particularly in incumbent firms, the ability to implement and execute a new BM is constrained significantly by current BMs (Gerasymenko *et al.* 2015). Openness towards and acceptance of a new BM is affected by a firm's dominant logic (Prahalad & Bettis 1986). Incumbent firms, especially those from mature industries, are often victims of their own success (Doz & Kosonen 2010). They are lacking in preparation and hence must turn their industry upside down before others do so, proving true the motto, "Disrupt yourself before others do". Many technology and BM disruptions have already occurred, but the effects vary for different market players (Dobbs *et al.* 2015). Some firms that have already introduced BM in their agenda have not experienced successful concrete results. Thus, it is highly relevant to understand the mechanisms of BMI from a theoretical perspective and perceive the opportunities for firms' success through BMI from a practical perspective.

2. Research gaps and research objective

As described in the previous section, incumbent firms from mature industries face several challenges. They stand to lose a great deal in terms of profit or market position (Chandler *et al.* 2014) and have a significant need to catch up in regards to BM renewal (Andries & Debackere 2007; Sandström & Björk 2010). Firms in these industries recently began implementing a growing innovation management agenda to create the next "breakthrough" BM and thus prepare for the future. Despite the fact that mature industries are an interesting field in which to study aspects of innovation, especially topics related to BM, only a few studies have explicitly studied BMs in these industries (e.g., Sabatier *et al.*

2012; Swaminathan 1998). It is well known that while the majority of incumbents have problems exploring new pathways (Casadesus-Masanell & Zhu 2013) due to dominant business and industry logic (Prahalad & Bettis 1986), they need to radically renew their BMs through innovation (e.g., Achtenhagen *et al.* 2013; Klang & Hacklin 2013). Despite this situation, little is known about BM and BMI in incumbent firms (Demil *et al.* 2015). After several years of intensive BM research, there are still more questions than answers regarding the overall BM concept (Wirtz *et al.* 2015; Zott *et al.* 2011). While there have been several attempts in academia to organize the different definitions and viewpoints of the BM concept, these have not grasped "the core of it" (DaSilva & Trkman 2013). Particularly, a systematic view of the BM concept as a whole (e.g., its functions, structural level, and processes) as well as a structured framework for BMI as a more dynamic level of BM are in short supply (Demil & Lecocq 2010; George & Bock 2011). A recent research article demonstrated that the BM concept can benefit from the adaption of existing concept or theories, particularly for generating new insights (Aversa *et al.* 2015b). Petrovic *et al.* (2001) argued that it is promising to apply a systems thinking (ST)[9] perspective to form an analytical foundation for BM research and enhance learning in complex business systems. However, it is unclear if ST can facilitate better understanding about BM and BMI and contribute to this emerging field of research.

In reference to BMI within organizations, especially for incumbent firms in mature industries, concrete concepts and guidance about how to innovative BMs are missing (e.g., Bucherer *et al.* 2012; Kim & Min 2015; Markides 2008). This is particularly true for renewing BMs in response to external changes or disruptions (Casadesus-Masanell & Ricart 2010; Doz & Kosonen 2010). Moreover, the overall transition process from idea to reality remains poorly understood (Koen *et al.* 2011; Reuver *et al.* 2013). However, initial concepts on BMI processes do exist in academia but are more representative of "inventions" because they are derived from the literature and seldom executed in practice (Achtenhagen *et al.* 2013). Therefore, systematic studies for generating both better understanding of BMI processes

[9] Systems thinking is an influential mode of thought based on systems theory and uses systems thinking approaches. It has a long tradition, represents a universally applicable approach Luhmann (1973), and has been revitalized within different management disciplines (i.e., innovation) Galanakis (2006); Dodgson *et al.* (2011). The extensive review in article I and II presents more details and arguments for its application.

and supporting firms with appropriate concepts to improve BM development are in short supply (Bock *et al.* 2012; Dmitriev *et al.* 2014; Kim & Min 2015; Schneider & Spieth 2013; Spieth *et al.* 2014).

In addition to this knowledge gap on the BM concept and BMI processes, uncertainty exists about the most appropriate and successful methodology for studying BMI in terms of simultaneously fulfilling academic requirements regarding rigor and relevance (van Maanen *et al.* 2007). A few scholars have called for a re-orientation of existing research activities and advocated for more engagement among researchers and practitioners (Alvesson & Sandberg 2011; van de Ven 2007). Especially for modern research set-ups, an appropriate methodological approach with a consistent research strategy is crucial (Pratt 2009). For research on BM and BMI, it is unclear if these requirements can be fulfilled. Currently, no overview exists on common research practices in the field, and there is little understanding about whether research is following "mainstream" approaches or using innovative methods (Sørensen *et al.* 2010). While researchers in other disciplines realize that a review of existing methodology and research design is necessary to understand the state of research in the field and identify challenges, promising trends, and methods (e.g., Beverland & Lindgreen 2010; Piekkari *et al.* 2010; Soni & Kodali 2012), this analytical step is lacking in BM and BMI research.

Consequently, the following overriding question can be deduced to address these knowledge and research-practice gaps: **How can systems thinking and an appropriate research set-up encourage better understanding of business model innovation?**

This dissertation seeks to solve three main issues derived from this overriding question.

To create a profound starting point and establish a point of scientific origin, the dissertation uses ST as the main viewpoint. This is necessary due to the "fuzziness" of the BM concept and the "slippery" character of BMI. ST is a proven approach and provides guidance to ensure a holistic, integrated, and interdisciplinary view of studied objects. Therefore, the following question addresses BM and BMI from an ST point of view: *How can the BM concept be described from an ST point of view and how does this view contribute to BM and BMI research?*

As an emerging field of research, BM and BMI studies are diverse and increasing. To

understand this research field and find an appropriate research set-up for the study, an overview of existing studies with suggestions is necessary. The following question addresses these issues: *What is current research practice in BM and BMI, and what is an appropriate methodology and research design for studying BMI?*

Focusing on the BMI process as the unit of analysis and incumbent firms in mature industries as the level of analysis, the third issue is focused on gaining new insights for better understanding of BMI. This involves grasping the core of how BMI works in practice and determining interesting propositions for future research. The following question addresses these issues: *How can incumbent firms from mature industries systematically tackle BMI?*

Considering these questions, the overall goal of the dissertation is to create a new perspective and insights on BMI. Accordingly, there are three subgoals: (1) to promote a systemic view of the BM concept for a better understanding and recognition of the potential contribution of ST to BM and BMI; (2) to identify the "mainstream" approaches and promising gaps in current research practice in order to propose a promising new research set-up for closer engagement between research and practice; and (3) to create empirical evidence from application of a modern research set-up in order to deliver new propositions for better explaining and understanding BMI mechanisms through novel cases in understudied industries. These research goals are focused on exploration and understanding and are thus qualitative instead of quantitative in nature.

3. Procedure and article summary

Based on the overriding question and sub-questions designed to achieve the research goals, the dissertation consists of five articles. These articles (shown in figure 2) display a logical, structural relationship and are briefly summarized in in the following section.[10]

[10] The articles do not include an abstract and each begins with an introduction section. The contribution of each article as well as the overall conclusion are discussed in the last chapter of this thesis. This chapter also conflates these contributions to create theoretical and practical contributions and critically reflect on the overall achievement of the goal of the dissertation.

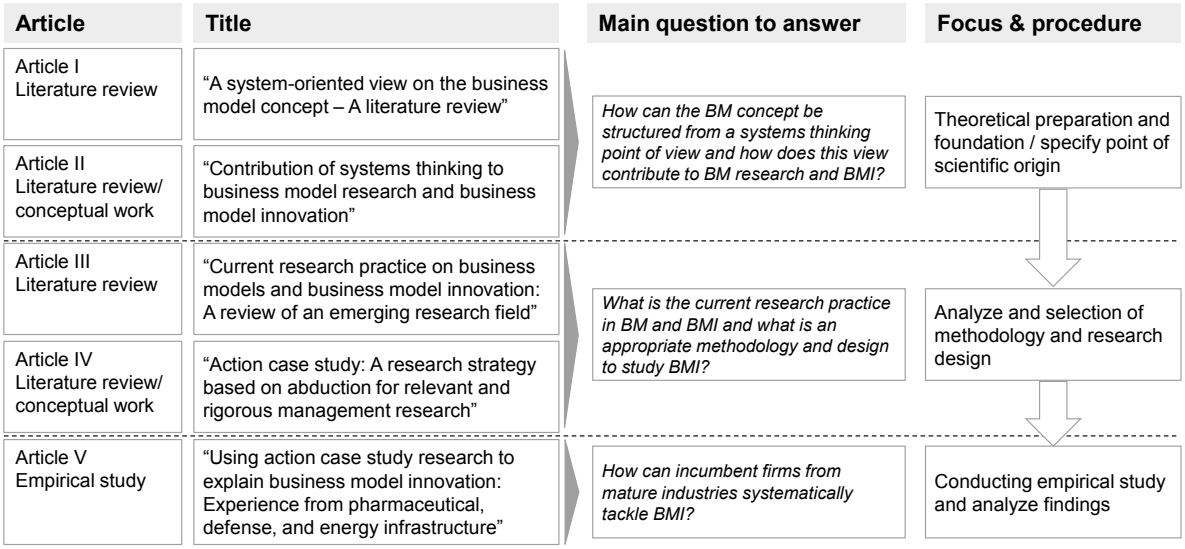

Figure 2: Overview of the five relevant articles

The emerging field of the BM concept is the focus of **article I**[11]. The article is based on the proposition that good strategic positioning in the market is no longer the only factor involved in firm success (Kim & Mauborgne 2005), and new strategic innovations (i.e., BMI) have come into play (Markides 2008). In the present, the force of creative (digital) destruction, as invoked by Schumpeter (Schumpeter 1939), is more relevant than ever for reinventing a firm before it abruptly disappearing. For activities necessary to renew and innovate ways of doing business, the concept of BM becomes increasingly important for firms and entire industries (e.g., Teece 2010). Because of the widespread use of pragmatic models, especially the Business Model Canvas (Osterwalder & Pigneur 2011), thinking about and working with BMs have become indispensable for management within recent years. The first article argues that every firm has a BM, whether implicitly or explicitly, consciously or unconsciously (e.g., Casadesus-Masanell & Ricart 2010). Furthermore, the BM is more than just another management tool (Doganova & Eyquem-Renault 2009) and should be understood as a prerequisite for later innovation activities (articles II and V). The huge and still growing number of publications concerning BM have not created or clearly summarized the function and role of BMs and their structure, processes, and governance. Noticeably, an overall holistic and thus systemic view on the concept itself is missing (e.g.,

[11] This article is a single-author working paper that was self-published through GRIN publishers in September 2013 with the title "Eine system-orientierte Betrachtung des Geschäftsmodell-Konzeptes – eine Literaturanalyse" (ISBN: 9783656841043). The e-book was requested 778 times from publication in the beginning of 2014 until December 2015.

Zott *et al.* 2011).

Therefore, the aim of article I is to describe and present the BM concept from a systemic point of view in order to create a structured perspective and consolidate existing knowledge from several research streams and trajectories. The article uses the BM concept as the unit of analysis and, based on a comprehensive literature review, describes and structures the BM concept along the ST dimensions of function, structure, process, and governance (similar to Zott & Amit 2010). It reveals several research gaps and shortcomings, which serve as the motivation for completing the dissertation. By revealing these gaps, the article answers the first sub-question and increases clarity about the unit of analysis, which is relevant for the subsequent articles and represents a starting point (i.e., theoretical anchor point) for the entire dissertation. The findings of the article reveal that it is helpful to describe and structure the "fuzzy" BM concept from a new systemic perspective in order to gain a better understanding of its current discussion and applications in the diverse BM literature. The article argues that a BM, in general, has three different functions (i.e., BM for analysis and explanation; BM for design, decision, and change; and BM for communication) and two main levels of structure. Furthermore, it emphasizes that ST provides a clear mental and activity framework to structure a concept like BM that thus far remains fuzzy. The article is one of the first to apply ST to the field of the BM (an exception is the work of Petrovic *et al.* 2001). The findings of the article indicate the promise of examining the large field of ST in more detail to determine tangible arguments about why and how ST can contribute to BM research and BMI. Accordingly, this is the focus of article II.

Article II[12] enlarges article I's focus on the transmission of the BM concept and BMI through ST. The precise goal of the article is explaining and subsequently transferring a concrete ST approach to the fields of BM and BMI. While article I takes ST as a view point on the BM concept, article II expands ST as a theoretical anchor point for the whole thesis. The article examines whether BM and BMI create added value from this interdisciplinary

[12] The co-author of this article is Matthias Hartmann (HTW Berlin). The first version of the article (titled "How can systems thinking add value to business model innovation?") was accepted by and presented at the 24th ISPIM Conference in June 2013 in Helsinki, Finland. After revision, the expanded version was published in the *International Journal of Technology Intelligence and Planning*, Vol. 9, No. 4, 2013.

transmission. Due to increasing interest in BM research in recent years (see article I), article II picks up the ST idea once more and focuses on applying ST to contribute to this emerging research field through cross-fertilization of BM, BMI, and ST. The article provides a brief review of different ST approaches within the extensive ST and systems theory literature. The synopsis reveals that ST is an influential mode of thought that is rich in tradition and provides several categories and many approaches. Article II uses a semiotic lens (a prerequisite for ST) to uncover the nominal definition of BMI. Comparing model theory (e.g., Schwaninger 2004; Stachowiak 1973) with BM development generates interesting findings in terms of model types (mental and formal), perspectives of time (static and dynamic), and functions (description, explanation, design, decision, change, and simulation). Finally, the article argues that BM research and practice can improve discussion and understanding and considers aspects of semiotic and model theory.

The recent, expanding interest in BMI has led to an increasingly diverse body of literature, in addition to the existing BM literature that addresses the main question of how firms can emphasize the identification, development, and support of new ideas for BMI (e.g., Achtenhagen *et al.* 2013; Schneider & Spieth 2013). After selecting an ST approach from the synopsis, article II discusses why such an application is promising (which serves as an indication for developing the study in article V). In addition, article II proposes and explains a four-dimensional, system-oriented framework (similar to article I) for guiding BMI activities. To innovate a BM systemically and, at best, radically, the starting point for (re-) thinking it is its function (i.e., value proposition). When changes occur regarding the function of a BM, interdependencies among the other dimensions of structure, process, and governance must be considered along with the ST concept (similar to the idea of Richmond 1987). This knowledge is also transferred into article V. The findings of article II reveal that using ST to gain a better understanding of the BM concept is an adequate way to deliver more insights on the question of how BMI can proceed conceptually from a holistic view. The proposed framework provides a clear agenda with a new perspective on BMI, which is one of the most complex and challenging management tasks (Zott *et al.* 2011). Finally, the results assume that BM thinking represents a later version of the application of ST. They reveal an interesting future research path, particularly the application of ST concepts for the examination of BMI within firms (article V). From this and during the preparation of

article V, the question arose as to what is the best way (methodology) to examine and study BMI within firms.

Article III[13] analyzes the number of empirical studies on BM and BMI, which has increased in parallel with the rise of the BM concept (Lambert & Davidson 2013; Schneider & Spieth 2013). Following the overall goal of this dissertation of studying BMI to gain new insights for a better explanation and understanding of the topic (the goal of article V), it is necessary to choose an appropriate research set-up (goal of article IV). When choosing a research set-up, current research practice must be determined (i.e., what research methodology, research designs, and methods have been previously applied in empirical studies of BM and BMI?). Additionally, it is relevant to identify challenges and promising trends as well as divergences between executed research and the suggestions and recommendations made by the research community (i.e., in academic journals). Profound arguments are necessary for developing an appropriate research set-up (i.e., methodology and research strategy), which is also addressed in article IV.

Therefore, the purpose of article III is to create a structured overview of BM and BMI research studies conducted between 2001 and 2014 based on the factors of existing methodology, research design, and methods employed. The article reviews 62 empirical studies, aided by a six-layer empirical research framework, commonly known as the "research onion" (Saunders *et al.* 2009), to classify and assign approaches, strategies, choices, time horizons, and data collection and analysis methods within the selected articles. The resulting structured overview reveals the variety of research as well as current focuses and promising gaps. One of the main findings is that the inductive (explorative) approach is the most widely used methodology (70%) and that case study is the most popular research strategy (68%) and is used in an average of 12 cases. While these findings

[13] This article was co-authored by Katharina Hölzle. At the beginning of the research, articles III and IV were combined in one article. After presenting and discussing the article twice at the IME internal scientific workshop at the University of Potsdam, it was divided due to content and story line. The resulting article III titled "A call for better research on business models and business model innovation: Review of an emerging field of research" was submitted to *International Journal of Management Review* in April 2015 and rejected by the Chief Editor in May 2015. In June 2015, the revised article "Current research practice on business model and business model innovation: Review of an emerging field of research" was submitted to the peer-reviewed, international *Journal of Business Models* and revised and resubmit in December 2015.

are unsurprising, this review is the first analysis of existing evidence and underpins common assumptions. The study also revealed that experiments and archival research have seldom been used and offer a promising outlet for future BMI and BM research (especially on innovative experimental designs and large-scale archival research). Furthermore, the findings revealed several inaccuracies within conducted research (e.g., the absence of methodological discussion and missing data on the number of interviews conducted) as well as a lack of a straightforward relationship between the research community's methodological requirements (e.g., engagement of scholars, innovative research designs, non-binary methods) and current research practice. To achieve academic excellence regarding the relationship between rigor, relevance, and revealing "ah-ha" moments (van Maanen *et al.* 2007), article III argues for rethinking current research practices to some extent and calls for new ways of researching BMI. This is the primary reason for developing an appropriate research set-up, which also meets the goal of this dissertation. An alternative form could be the seldom-used abductive methodology in combination with a novel research strategy—the action case study (ACS), which is developed and suggested as a potential research strategy in article IV.

The focus of **article IV**[14] is the frequently debated importance of rigor, relevance, and necessary "ah-ha" moments (van Maanen *et al.* 2007) in research projects and increasing expectation of the use of innovative research designs in such projects (Sørensen *et al.* 2010). As article III illustrates, the research on BM and BMI is not innovative and most studies have followed the mainstream by using the inductive approach in combination with the case-study research strategy. Furthermore, article III highlights that increasing requirements for conducting modern research require an appropriate methodological approach and a consistent research strategy (Pratt 2009). Based on the findings of article III, the goal of article IV is to introduce and explain a research set-up that differs from mainstream perspectives within the area of innovation management research. By

[14] This is a single-author article. The first draft of the article was presented at the *British Academy of Management* (BAM) Doctoral Symposium on September 9, 2013 in Liverpool, England. The article was further developed during a research visit at Manchester Institute of Innovation Research at Manchester Business School under the supervision of Prof. Ian Miles and Prof. Trevor Wood-Harper in September 2013. After several revision cycles, the paper was submitted to the *Journal of Business Research* in April 2015 and rejected in the same month. After incorporating feedback, the article was published in the *International Journal of Business Research* Vol. 15, No. 4, 2015.

explaining the abductive approach, the article proposes ACS as a new hybrid research strategy. This suggestion considers requirements for the successful application of innovative methodological ideas as stated by the often-cited *Academy of Management Journal* article of Bartunek (Bartunek *et al.* 1993). Our article describes a concrete conceptual overview (i.e., procedures) of the abductive approach and provides a template for conducting research based on this concept. Furthermore, the article argues that ACS is a promising non-linear research strategy that is perfectly suited to abduction and meets the expectations of both the research community and, increasingly, practitioners (Sandberg & Tsoukas 2011). ACS provides a contrast to existing research strategies due to its position between action research and case study (Braa & Vidgen 1995). BMI projects are often complex and dynamic, which necessitates an action-based research design with temporary interaction and readjustment possibilities. Article V describes how to apply this set-up in a research project and how the interaction with real-world organizational and managerial problems works. However, ACS based on abduction represents research in action rather than research about action. This is also in line with the ST perspective described in articles I and II because ST often accompanies action-oriented research (e.g., Flood 2010). Article IV delivers new food for thought regarding the required re-orientation of (innovation) management research and the expected re-orientation of the relationship between researchers and practitioners (Alvesson & Sandberg 2011; van de Ven 2007) and creates the guidelines employed for the empirical research outlined in article V.

Article V[15] focuses on how BMI works in practice and is based on the research set-up suggested in article IV. Given the fact that BMI can be either an outcome (i.e., result) or a process, this article uses the BMI process as the unit of analysis. In this context, the BMI process can be described as a process to find a new design to reposition a firm in response to external environmental changes (e.g., technological or regulatory changes) (e.g., Amit & Zott 2015). The level of analysis is the BMs in the three selected firms in mature industries. The article address the gaps described above regarding the short supply of systematic studies for generating better understanding of BMI and supporting incumbents with

[15] This is a single-author article and was presented at the 31th EGOS Colloquium held during July 2-4, 2015 in Athens, Greece. It was submitted to sub-theme 65 titled "Translating the Business Model into Action: Practice and Performativity" and was chaired by Charles W. F. Baden-Fuller, Stefan Haefliger, and Vincent Mangematin.

appropriate concepts to manage new BM development (Bock *et al.* 2012; Dmitriev *et al.* 2014; Kim & Min 2015). The research strategy employed applies an abductive research methodology approach combined with ACS (explained and analyzed in article IV) in addition to a series of "back-and-forth" revision cycles between theory and practice (Dubois & Gadde 2002, 2013). The article includes a literature review, followed by a pre-study, in an attempt to understand the current situation and the areas of concern regarding BMI within mature industries. The pre-study findings were used as a guide for a theory search (in another iterative cycle) that identified the functional market concept (FMC) which stongly references ST (Pfeiffer *et al.* 1997) as an appropriate theoretical framework used as the main study guideline. The main study consists of a total of three ACS, one from each of the following industries: pharmaceutical, defense, and energy infrastructure. During the application of the FMC elements of exploration, evaluation, and action planning through workshops, several interesting BM related findings were collected directly from the field. The main findings were formulated into eight propositions within each of the three elements of the applied framework. An example from the eight formulated propositions is as follows: the initial exploration of new BM alternatives represents the simplest part of the BM renewal process in terms of internal acceptance as well as process and time required. This proposition could potentially result in interesting discussion as a majority of the BMI literature is focused on this (easy) ideation phase. After executing the three elements of the FMC, the framework was slightly adapted to propose a concept for the holistic and structured management of BMI. The main contribution of the study is the application of the FMC framework in a real-world setting, which revealed several new insights, particularly through propositions and expanded knowledge explaining how BMI occurs in practice. The article also contributes to methodology with the combination of abduction and ACS (article IV) and a focus on "problematization" (i.e., practical problems) (Alvesson & Sandberg 2011), which enables real-time study (i.e., "catching reality in flight") (Pettigrew 1990). Additionally, the series of iterative moves between theory and practice can mitigate the frequently mentioned theory-practice gap (Sandberg & Tsoukas 2011).

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A SYSTEM-ORIENTED VIEW OF THE BUSINESS MODEL CONCEPT - A LITERATURE REVIEW

1. Introduction

1.1. Problem statement

Environmental dynamics and major changes in the competitive landscape of the global economy have direct and indirect impacts on all companies and their existing business models. Furthermore, various megatrends (including e.g., demographic change, climate change, and digitization) shape and influence the actions of companies and their future development in a substantial manner.

The rising intensity of competition combined with increasingly shorter innovation and technology cycles are forcing companies to seek new solutions to problems, respond accordingly, and act in advance. In recent decades, companies concentrated primarily on competition-based strategies (Porter 1981, 1985). Merely having good strategic positioning in the market or among the competition is currently no longer sufficient for success; instead, companies often engage in cutthroat competition (Kim & Mauborgne 2005). As an alternative, companies need to rethink their strategic logic. Pure competitive spirit should no longer dominate; the aim should instead be to create new strategic innovations, or so-called value innovation, and enable the discovery and application of new business models (e.g., Markides 2008). This path should force companies to question and realign their actions so that customers and companies themselves gain in value (Kim & Mauborgne 2005). Thus, the rethinking of customer value seems to be the only appropriate response for companies. In particular, this allows companies that do not own a technically successful innovation to increase their chance of prevailing over larger competitors or entering or persisting in new markets with established market participants (Markides 2008; Johnson 2010).

Current developments in the volatile business environment, global megatrends, and the competitive situation in various sectors have put the existing business models of entire

industries to the test (Teece 2010). Nothing has been left untouched. Nokia, a major supplier of devices for the modern information society, once sold rubber boots. Today, however, Nokia is experiencing an existential crisis and Apple and Samsung dominate the market. This raises the question of what the future holds. Which business model will replace Apple's currently successful business model? As another example, only a few years ago, coffee evoked no fascination as an innovation object; then, Nestlé revolutionized the coffee market with its Nespresso business model. The Nespresso business model has led to customers willing to pay the equivalent of €50-70 for a kilogram of coffee beans standing in line for coffee capsules. These examples demonstrate that the force of creative destruction, as invoked by Joseph Alois Schumpeter (Schumpeter 1939), is more relevant than ever. This is true to the motto: "Anyone who does not reinvent, disappears!". The new emerges from the ruins of the old, and the success of today does not guarantee success tomorrow. This effect could not be any clearer than it is online, particularly when remembering the social media heroes of a few years ago. In the field of social networks, there was first Friendster (2002–2004), then MySpace (2004–2007), while today Facebook is the de facto sole top dog.

The current business environment is all about constant and total renewal. Many companies pass on opportunities every day because they continue to believe in out-dated business models. It is clear that an innovative business model is characterized by its ability to adapt permanently to changes in the market as well as changing customer demands (e.g., Magretta 2002).

Business model innovation (also called strategic innovation) represents a new type of organizational renewal. It is closely associated with the field of organizational theory and strategy research, which discusses and inspects companies' changes in response to various influencing forces. The business model concept[16] is increasingly important, not only for entrepreneurs and companies but also for industries, countries, and society (Teece 2010).

Before a business model innovation is introduced, there should be clarity about the existing

[16] It remains to be proven whether the examined construct of the business model is indeed a concept. A concept is understood as a clear plan or program. However, clarity of the term and the understanding of its components and utility are nor apparent in the literature. Nevertheless, the present work makes use of this term, at least to ensure uniformity in the language.

business model. Every company has a business model, whether implicitly or explicitly, consciously or unconsciously (Casadesus-Masanell & Ricart 2010; Teece 2010). Furthermore, a business model is much more than just a management tool (Doganova & Eyquem-Renault 2009). In the future, the sole focus of competition will no longer be limited to the right product and market strategies; instead, the right business model will become the centre of attention (Zott & Amit 2008).

Although the term "business model", in both in theory and practice, is used far too frequently and without any unity of understanding, the concept behind it has become indispensable in today's economic and scientific world. In addition, the number of publications concerning business models and business model innovation has increased drastically in recent years, albeit without increasing clarity on the topic (Zott *et al.* 2011).

1.2. Research objective

The problems outlined above and the need to consider all forms of business models lead to the following overriding question that guides the present article: How can we extensively and clearly describe the business model concept from a systemic point of view based on the current literature?

We can derive the following hypotheses from this overriding question:

- The business model concept can be analyzed from epistemological and linguistic points of view and critically compared with existing definitions, which is a prerequisite for system-oriented work.
- A dedicated theory for the business model does not exist, and the concept cannot be explained by an existing theory alone.
- The business model can be described using the following system perspectives: function, structure, process, and governance.

The present work is intended as a structured and comprehensible general overview on the literature on business models. The aim is to establish a better understanding about the business model concept and relevant terminology. An overview of the current state of discussion and application is provided both strategically (classification and necessity) and

methodologically (methods and tools). Based on this, emphasis can be placed on future discussion and research activities.

In the present article, business models are predominantly considered from the perspective of existing, incumbent firms. Business model innovations in start-ups are different in size, complexity, and setting from those in incumbent firms and are thus not considered.

1.3.Methodology and mindset

A business model abstractly describes—in a reprise of systems thinking (Petrovic *et al.* 2001; Sterman 2000, p. 22)—how a business works (Magretta 2002), its components, and how these components are related (Amit & Zott 2001; Chesbrough & Rosenbloom 2002; Osterwalder & Pigneur 2011). The holistic, systematic, and integrated thinking based on systems, in short, systems thinking (ST). ST has a long tradition (e.g., Bertalanffy 1956; Pfeiffer 1971; Ropohl 1979), and is used in this article as the methodology, or primary approach, for analyzing all the elements in a system based on appropriate contexts as well as cause-effect relationships. Research have published articles based on ST in recent years and have successfully transferred ST into innovation management (Dodgson *et al.* 2011; Galanakis 2006; Pagani & Fine 2008), thereby providing a new boost for the approach. The business model, which describes in other words the function, structure, process, and governance of a (business) system (Pfeiffer 1971; Pfeiffer *et al.* 1977), has established itself as a tool and subject area in practice and theory by simultaneously offering a new means of explanation and a new research field. Its widespread use in practice is due to its pragmatic methods (e.g., the *business model canvas*). The advantages offered by the systems approach are manifold and can be transferred to the business model concept (e.g. Petrovic *et al.* 2001; Pfeiffer 1971). These include: (1) the possibility of integrating knowledge from different scientific disciplines (e.g., innovation and technology management), which is important in the analysis of a problem (multidisciplinary); (2) the provision of a single starting point for different views of complex company events (systematics); and (3) the recognition of contexts and multi-layer cause-and-effect relationships and exposure to previously unknown contexts as well as the avoidance of an isolated view (degree of integration).

ST helps achieve clarity within the business model construct and encourages thinking in

terms of contexts.

1.4. Procedure

To answer the overriding question derived from the problem statement in chapter one, chapter two details the methods employed in this article. It describes the components of a good literary analysis as well as the characteristics of the present analysis. Chapter 3 provides an overview of the current state of discussion on the subject of the business model and business model innovations (as of 2013) in the context of preliminary theoretical considerations. Further, it also briefly discusses the development of the business model, dissecting the term and elucidating it from a linguistic point of view. The end of the chapter provides definitions and intersections with respect to terms such as strategy and innovation. Chapter four represents the core of the work, divides the business model concept based on ST perspectives, and examines it accordingly. This leads to a holistic and integrated overview and creates a conceptual (thinking) framework as well as a theoretical preparation for the whole dissertation. The fifth chapter provides a summary and highlights new fields of action and research paths.

2. The literature review as a method

2.1. Methodological introduction to the literature review

The present work is a literature-based scientific research paper, or *literature review*. A good research paper expands and thus advances existing collective understanding of a topic. To expand existing understanding, the literature that already exists on a topic and its strengths and weaknesses should be understood. For this purpose, it is necessary to establish and process the main findings from existing works. To determine further research activities, it is essential to first understand the literature on a topic (Boote & Beile 2005).

A literature review has several objectives (Boote & Beile 2005), including to:

- Define the broad context of existing work and its focus, determine any gaps in content and provide justifications for the choice of focus.
- Classify the existing literature within a broad scientific context.
- Critically examine existing approaches and methods employed in the existing literature and determine what has been achieved and what has not yet been examined.
- Summarize and synthesize the existing literature to obtain new perspectives.
- Establish the qualitative basis for further theoretical and methodological investigations.

Studies have shown that most literature reviews exhibit methodological and conceptual weaknesses (Alton-Lee 1998). By considering certain criteria, a methodological, conceptual, and demonstrably comprehensible framework can be ensured. Hart (1998) established the following five criteria categories: (1) literature coverage, (2) synthesis, (3) methodology, (4) significance, and (5) rhetoric.

Literature coverage justifies what is included in a review and what is not. *Synthesis* clarifies what the literature has already covered and identifies any relevant gaps. Synthesis ultimately provides new perspectives on the literature. A literature review should consider strengths and weaknesses of the *methodology* used in the relevant literature and discuss current methodological approaches and developments. It should also discuss the practical and theoretical *significance* of research if necessary. The *rhetoric* should follow a clear and consistent structure and substantiate the entire review.

2.2. Characteristics and procedures of the literature review

Considering the above criteria, we can characterize the present work based on characteristics based on Cooper's (1988) work. Table 2 outlines these characteristics.

Table 2: Characteristic of the present literature review (Source: adapted from Cooper 1988)

Characteristic	Applied on present literature review
Focus	Existing business model literature (also includes the still relatively new theory strand of business model innovation)
Objectives	- Analysis and summary of the current literature - Explication of the essential terminology - Synthesis and thus creation of a new perspective on the literature - Use of systems thinking to acquire new knowledge - Identification of research gaps and raising of new questions
Perspective	Qualitative literature analysis
Literature coverage	Business model literature: Comprehensive review in selected sources; search string for EBSCO Business Source Premium, A, B, C journals–in General Business Administration; Technology and Innovation Management using the keywords "business model" in title or abstract; current dissertations and practitioner journals (e.g., Harvard Business Review) used as complements
Focus (organization)	Conceptual format: Analysis of different business model concepts according to various definitions as well as the function, structure, processes, and governance of a business model
Target group	Research community

The literature review procedure can be divided into five essential steps (Cooper 1988):

1. Problem formulation - derive and define an overriding question (see chapter 1)
2. Data collection –
    a. Identify and procure relevant articles according to the pre-defined search string in the EBSCO Business Source Premium for the key term "business model" in title and/or abstract (n = 95 articles)
    a. Check for relevance (heading, keyword, abstract) by criteria:
        - Errors in the use of the term
        - Irrelevant mention or use of the term (i.e., no reference to the organization or business)

- No significant statements or contributions to business models
- Reduced to n = 70 articles

b. Complement with relevant articles and books not included in the search string

c. After these steps, n = 60 articles remained for inclusion in the literature review

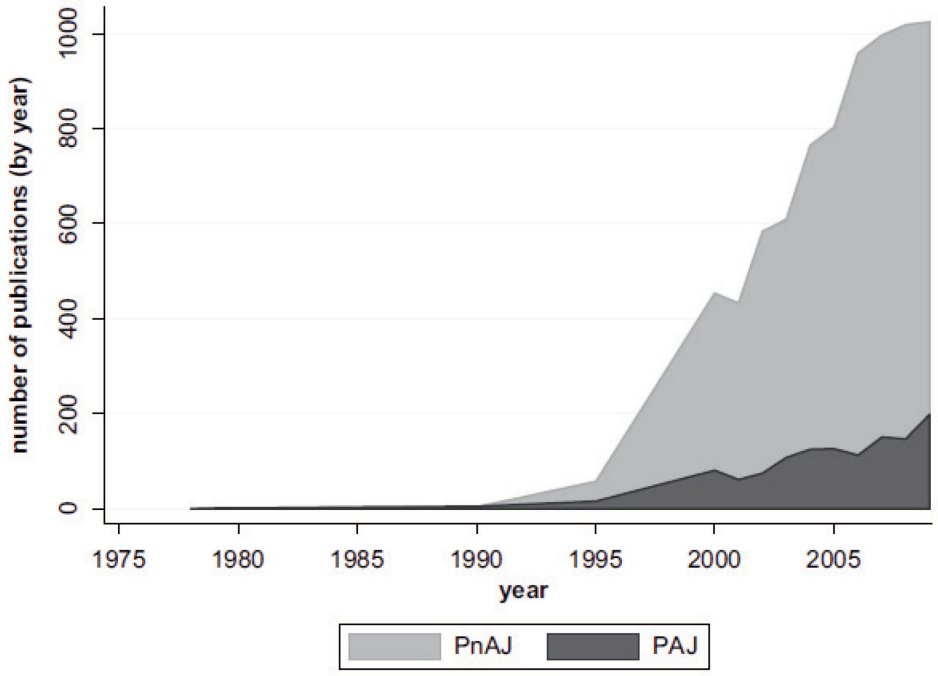
3. Data evaluation
    a. Basic distinctions according to the different definitions, statements and underlying concepts
    b. Evaluation of data (articles) according to function, structure, process, and governance of business models
4. Data analysis and interpretation
    a. Summary of collected facts, which can then be interpreted accordingly
5. Presentation
    a. Collected information sorted by importance and relevance
    b. Less important information is omitted
    c. Important information is meaningfully structured and included as part of the present work

3. Preliminary theoretical considerations

3.1. Development and current relevance of business models

Analysis of publications on the topic of the business model reveals a dramatic rise in the number of practical and theory-based publications in the past decade (Zott *et al.* 2011). Since 2010, there has been a strong increase in scientific publications on business models.[17] This increase is partly because economic research has included business models as subject matter and a classification tool and not because business models have been the primary subject of investigation (e.g., Casadesus-Masanell & Llanes, 2011; Lazonick & Tulum, 2011).

[17] A special issue of *Long Range Planning Journal* 43 (2010) alone included 18 different papers on the subject of business models in four categories.



Note: This area graph shows trends in the number of business model articles. PnAJ = articles published in nonacademic journals; PAJ = articles published in academic journals.
Source: Business Source Complete, EBSCOhost database, January 1975–December 2009.

Figure 3: Publication levels for business model articles, in academic and non-academic fields (Source: Zott et al. 2011)

The rise in the number of publications in the mid- and late-1990s has been primarily linked to the development of the Internet and the economic boom from e-commerce and was originally clearly focused on analysis and explanation of e-business (Amit & Zott, 2001). Other reasons for the drastic increase in important publications on business models, even after the end of the new economic boom, are the growth in emerging markets and the emergence of new, expanding industries and organizations (Zott *et al.* 2011). The economic boom has led companies of the so-called *old economy* to review and adapt their business models and expand them to include e-business components. However, the formerly prevailing distinction between *new economy* and *old economy* has increasingly disappeared, partly due to the business model discussion and fundamental advances in the field of information and communication technology.

Morris *et al.* (2013) expanded existing understanding of the development of the business model by defining four different development stages (Morris *et al.* 2013): (1) first appearance (mid-1980s) in the context of computer (simulation) information systems; (2) popularity

(second half of the 1990s) and increasing occurrence of the term with the e-commerce and the dot-com booms; (3) description of the phenomenon (circa 2001 to 2007) in scientific papers dealing with the concept and its components; and (4) business model analysis and operationalization (over the past five years), including examination and analysis of the underlying characteristics and success factors of business model innovation.

From the development and above descriptions, we can conclude that the business model is a current and relevant construct that is assuming an increasingly important role in business practice as well as in science and society.

3.2. The business model from a semiotic viewpoint (nominal definition)

An epistemological, especially a semiotic or linguistic dissection of the term business model is meaningful as the term has already experienced a high diffusion rate and been subject to almost inflationary use in practice with no analysis of the meaning of the elements of the term. Nominally defining the two words *business* and *model*, which comprise the term business model, is helpful for understanding the meaning of the term.[18] The focus, however, should be on the business model concept as this will result in some important implications and increase understanding of the term.

3.2.1. The term *business*

The term[19] business refers to any form of profit-making activity (Duden 2012). Among others, another relevant definition of business is a transaction as a mutual transfer of products and services. In the 1970s, the field of computer science concentrated on transactions with the aim of accomplishing the collection and presentation of business processes and information systems in companies (Zollenkop 2006). In the economic

[18] In the philosophy of science, colloquial examples are often cited. For example, based on the two known words "white" and "horse" the new word "mould" has been defined and the word "white horse" is rarely used. It is important that the individual terms are known *per se* and understood (Seiffert 1996, pp. 37-38).

[19] We refer to a term whenever meaning is at stake. A term thus represents a semantic unit (examined here), in contrast to a linguistic unit (Seiffert 1996, pp. 56-67).

literature, understanding of the term concerns, in a broad sense, the pecuniary exchange of economic agents, and in a narrower sense, commercial activity of economic units (mostly businesses) with the intention of profit-making. Especially with regard to the narrower interpretation of the term, it is appropriate to engage in some additional considerations.

In the narrower sense, business focuses on the combination of resources and capabilities for beneficial activities that will generate profit. Three essential dimensions comprise the basic elements of a business: (1) know-how and/or technologies (resources); (2) product and/or services; and (3) target groups and/or markets (see figure 4) (Gharajedaghi 2007).

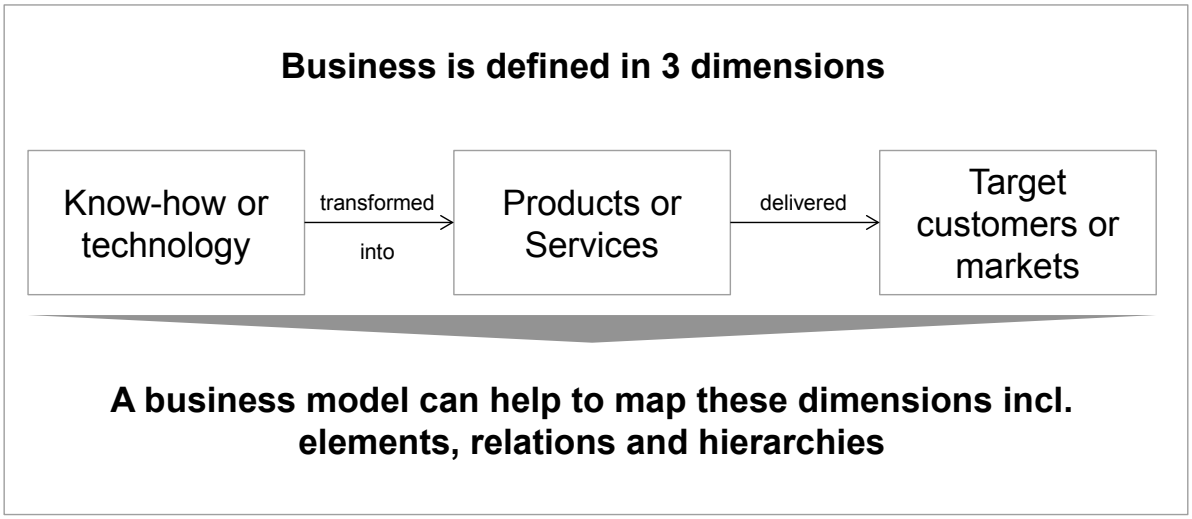


Figure 4: Dimensions of a business (Source: adapted from by Gharajedaghi 2007)

The refined understanding of the term *business* applied to the business model concept means that a business model is intended to precisely reflect, in a simplified and shortened manner, these three dimensions of a business, including essential aspects such as elements and relationships.

According to Drucker, it is necessary to understand the purpose of a business, which must lie outside the actual business. The following quotation illustrates what Drucker meant by the purpose of a business: "There is only one valid definition of business purpose: to create a customer" (Drucker 1954, p. 37). This clarifies that customers determine what constitutes a business (Drucker 1954).

3.2.2. The term *model*

The term model comes from the Greek word *metron*, which means scale or measure and the Latin word *modus*, which means pattern or template. In scientific and linguistic usage, the term is understood mainly as an entity or simplified representation of the function of a thing or object that facilitates an examination or investigation or makes it possible in the first place (Duden 2012). In the management literature, a model is understood as "... a simplified image of a reality" (Schwaninger 2004, p. 53).[20] Models have a long history, especially in biology and economics. Models can be divided into two basic types: explicit and implicit, or so-called mental, models (Schwaninger 2004). Mental models present a structure and create in the mind a selective abstraction and strong simplification of reality (Gharajedaghi 2007). Explicit (formal) models place reality in a rigorous and logical structure and can thereby be very specific and exhibit a high degree of precision (Stachowiak 1973).[21] Furthermore, so-called frameworks take an even broader approach than mental models and enable orientation by specifying dimensions and categories. Figure 5 illustrates the different levels of models.

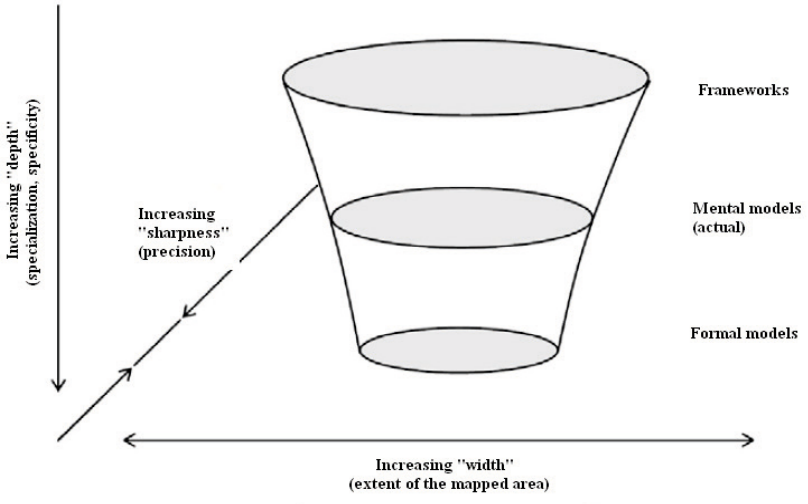


Figure 5: Overview for levels of models (Source: Schwaninger 2004)

However, two uncertainties encumber the image of reality in a model. Firstly, individual

[20] According to Baetge, in economic sciences, "... a model is understood as general or abstracted, unambiguous statements about the structure and behavior of a section of the economic reality" (Baetge 1974, p. 47).

[21] Due to their stringent, logical, and mostly mathematical structure, formal models are primarily used in mathematics and the natural sciences (Schwaninger 2004).

perception and interpretation of reality are highly subjective processes. Secondly, the respective situation plays a role in the imaging process since different aspects may be incorporated.

As already mentioned, the purpose of models is primarily the simplification of complex contexts (Schwaninger 2004). By increasing abstraction (i.e., increasing reduction or generalization), complexity can be reduced (Ropohl 2012). From the scientific side, models are of great importance in the cognitive process (Stachowiak 1973). In biology, economics, and management, models are used to solve a fundamental problem, namely, the lack of knowledge (Baden-Fuller & Morgan 2010).

According to Stachowiak (1973), models have three generic characteristics: (1) imaging – models are always images of something; (2) shortening – only attributes that seem relevant to a model's creators are recorded; and (3) pragmatic – a model must have a purpose for its users (practical relevance). Apart from the question of what a model represents, it must be clear for whom the model is appropriate and when and for what it is intended to be used.[22]

In principle, it is possible to differentiate, on a factual level, between partial and total models and, on a temporal level, between static and dynamic models (Baetge 1974, pp. 50-52).

According to Schwaninger (2004), models can be divided into six different types based on their exact function: (1) descriptive model; (2) explanatory model; (3) design model; (4) decision model; (5) change model; and (6) simulation model.

This allows the identification of two type categories. Model types 1 and 2 are concerned with the description of complex circumstances from reality in order to promote understanding and create a basis for explanation and are in one category. The remaining model types serve creative work and entrepreneurial decision-making and improvement processes and are in the second category.[23]

[22] A model must fulfill the following requirements: (1) consistency, (2) relation to reality (3) relation to objective. The quality of a model can be determined based on the degree of fulfillment of these requirements (Baetge 1974, pp. 47-48).
[23] This breakdown is utilized again in section 4.1. to illustrate the functional point of view that a business model provides an appropriate framework.

When analyzing economic problems, abstraction of real processes using graphical and mathematical models is required. Thereby, it is important that a certain structural similarity exists between a model and reality (Baetge 1974, p. 48). Models have the advantage that they provide an overview that is easier to understand than reality; however, they have the disadvantage that they can never completely and accurately reflect reality (Baetge 1974; similar to Einstein's quote: "All models are wrong, but some are useful.").

3.2.3. Implications for working with business models

The understanding of models in science and their according function of simplification of explanation of a fact (see above) has been transferred to business models. Business models can thus serve as a useful construct for reducting complexity in the context of describing and explaining (analyzing) the meaning of the term "business" and as a tool for business modeling (design) and (further) development.[24] Without business models, it would be difficult to describe a complex corporate world in a structured and abstract manner and make it accessible for employees and management. Thus, a business model can be considered a framework and (mental) model (see figure 5).

Furthermore, a business model presents a partial model on the factual level (only the business is regarded as part of the overall economic context) and a static model on the temporal level.[25]

Through abstraction and increase of understanding, business models also generate knowledge (Baden-Fuller & Morgan 2010) and create added value for firms in the form of identifying the need for action and engendering promising design options. This also enhances the focus on the actual core elements of a business. Since the business model is a mental model based on the knowledge of insiders (employees), it differs significantly from models employed in other sciences (e.g., biology or mathematics) (Baden-Fuller & Morgan 2010). Thus, a business model cannot be a formal model (see figure 5).

[24] Section 4.1 addresses the function (i.e. purpose) a business model actually serves.
[25] The term "dynamic business model" is indeed occasionally used in the literature. It becomes clear upon closer examination that it does not present a dynamic model. This is distinguished specifically by the fact that temporal interdependencies and thus effects of time are included (Baetge 1974, pp. 50-52).

It should be noted that the business model cannot be used to achieve complexity per se in the form of reduction of elements and their relation to each other; instead, it exclusively presents a tool for orientation in the complex business world and a basis for attempts to reduce complexity. Furthermore, the business model must be distinguished clearly from other "market devices" such as a business plan or balance sheet. (Baden-Fuller & Morgan 2010; Doganova & Eyquem-Renault 2009).

From the model perspective, the function and thus the purpose of the business model is the simplified depiction and description of an often complex firm structure to determine the current situation and provide a basis for further development. However, it can also serve as a model for scientific investigation (Doganova & Eyquem-Renault 2009).[26] Additionally, a business model helps make reality perceptible and accessible to observers.

In the end, business models help managers ask the right questions, or even ask them in the first place, regarding how to engage customers and earn money in the present and future (Magretta 2002).

3.3. Definitions of business models in science and practice (actual definition)

This section briefly examines the philosophy of science in order to create sufficient understanding of its procedures and structure.

Section 3.2 presented a nominal definition of the term *business model* generated from the definitions of the words *business* and *model*. In the following, the term business model is regarded in terms of a real definition.[27] Herein, a real definition is referred to as a "definition" in daily (scientific) life.[28]

Although the term business model is omnipresent in science, media, business, and politics,

[26] In the course of conducting the literature review, it became evident that the majority of analyzed publications use the business model as a model for the support of scientific research.
[27] Since a definition is merely an abbreviation (Poser 2001, p. 93), this section aims to describe the business model.
[28] In a terminologically correct science, a scientific definition explains principally unknown words using already familiar words.

among other fields, and its use is somewhat inflated, a clear understanding of the business model prevails in neither science nor practice (Zott *et al.* 2011).

3.3.1. Definition of business models in science

The following terms are used in the literature as synonyms for the term business model: statement, description, representation, architecture, conceptual tool or model, structural template, framework, pattern, set (Zott *et al.* 2011), plan, method, and assumption (Morris *et al.* 2005). In science, there is currently no agreement on the definition of a business model (Zott *et al.* 2011), l*et al* one what purpose it serves. Nevertheless, several attempts have been made to approach a common understanding.

Morris *et al.* (2005) conducted content analysis on the hitherto used 30 definitions of business models and established the following three definition categories (Morris *et al.* 2005):

- Economic - logic of profit generation (value capture)
- Operational - in relation to the architecture (value creation)
- Strategy - market position, transboundary interactions, and growth opportunities.

Various works have defined the term differently and can accordingly be assigned to one of these three categories. It is evident that business model research operates in "silos", which are always directed according to the respective interest of researchers (research teams) (Zott *et al.* 2011).

In their 2011 literature review, besides listing the most widespread definitions in their view, Zott *et al.* arrived at a three-fold division of the term business model into "E-business model archetypes", "business model as activity system", and "business model as cost/revenue architecture" based on existing works. They intended their work to support future research work in their orientation and act as a first step toward unification (Zott *et al.* 2011). Unfortunately, newer works do not always clearly indicate acceptance of this classification (e.g., Casadesus-Masanell & Zhu 2013; George & Bock 2011).

The different perceptions of the term and the fragmentation of the definition of the business model have made it almost impossible to conduct uniform research (George & Bock 2011).

It should be noted that business model is an emerging research field exploding issue with unclear language. Porter's statement more than 15 years ago that due to its fuzziness, the business model should be described as "an invitation for faulty thinking and self-delusion" (Porter 2001, p. 76) is certainly no longer fully true as the plurality of research work has been able to significantly reduce this fuzziness. However, a stale aftertaste of disunity remains in the understanding of what a business model is and what it serves.

The philosophy of science, already applied above as a tool, serves as the epistemological framework for regulation and evaluation of an encompassing definition.

The regulation framework incorporates the following epistemological definition rules (Seiffert 1996):

I. A definition must be clearer than the thing it defines *(saccheris)*
II. A definition must principally replace unknown words with those that are already familiar (circular reasoning)
III. A definition must be appropriate (neither too wide nor too narrow)
IV. The origin of a definition must be traceable (*a priori*)

In the following overview of the existing definitions of the term business model, the last column indicates which definition rules are fulfilled.[29]

Table 3: Overview of selection of existing definitions of the term business model incl. its function and fulfilment of definition rules

Author(s), Year	Definition	Function	Fulfilment of definition rules
Amit & Zott 2001; Zott &	The business model depicts "the content, structure and governance of transactions designed so as to create	Depiction (to create value through	I, III, IV

[29] It was not possible to list and analyze all definitions in the overview. The selection was made based on subjective assessments formed during analysis of the literature. More recent definitions (e.g., Bender & Reinhold 2011; Wirtz 2010) build on existing definitions and expand them only marginally.

Amit 2010	value through the exploitation of business opportunities" (p. 493) Business model as "a system of interdependent activities that transcend the focal form and span its boundaries" (p. 216)	exploitation of opportunities); Spanning boundaries	
Casadesus-Masanell & Ricart 2010	"A business model is … a reflection of the firms realized strategy" (p. 195)	Reflection	I
Georg & Bock 2011	The business model is "the heuristic logic that connects technical potential with the realization of economic value" (p. 529)	Connector, mediator	I, IV
Magretta 2002	Business models are "stories that explain how enterprises work. A good business model answers Drucker's age-old questions: Who is the customer? And what does the customer value? It also answers fundamental questions every manager musk ask: How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?" (p. 4)	Design (to enact opportunities)	I, II, IV
Mitchel & Coles 2003	"A business model is the combination of 'who', 'what', 'when', 'where', 'why', 'how', and 'how much' an	Connector, explanation	I, II, IV

	organization uses to provide its goods and services and develop resources to continue its efforts." (p. 17)		
Morris *et al.* 2005	A business model is a "concise representation of how an interrelated set of decision variables in the areas of venture strategy, architecture, and economics are addressed to create sustainable competitive advantage in defined market." (p. 727)	Representation (to create competitive advantage)	II, IV
Osterwalder & Pigneur 2010	"A business model describes the rationale of how an organization creates, delivers, and captures value." (p. 14)	Description, explanation	I, II, III, IV
Teece 2010	"A business model articulates the logic, the data and other evidence that support a value proposition for the customer, and a viable structure of revenues and cost for the enterprise delivering that value" (p. 179)	Articulation (structuring, outline)	I, II, III, IV

In their literature review, Zott *et al.* analyzed 103 articles and found that 37% did not define the term business model, 44% defined the term, and 19% cited a source. This shows once again that research is taking place in "silos" and that there will be further definition attempts in the future.

However, the literature contains one common feature: the vast majority of works understand and describe the business model as a concept (e.g., Baden-Fuller & Morgan 2010; Teece 2010;

Zott & Amit 2008).[30]

3.3.2. Usage of the term in practice

Companies' use of the term business model has grown significantly in recent years and the term is currently a fashionable "buzzword" (Magretta 2002; Zott *et al.* 2011). In practice, there is a widespread opinion that management knows what their company's business model looks like and how it functions (Casadesus-Masanell & Ricart 2011). However, this is not always true. In many cases, the semantic meaning of the term is very different from its pragmatic utility (i.e., determining what necessitates action).

Semantically, the term business model has been equated with operations for revenue generation (Amit & Zott 2001) or confused with Porter's value-chain principle. Additionally, properly separating the terms strategy, business model, and tactics from each other is problematic (Casadesus-Masanell & Ricart 2010).

From a pragmatic perspective, one difficulty is that companies too rarely link problems with weaknesses in the business model. While they interpret and understand signals, they do not implement concrete action in terms of adaptation or alteration of the existing business model (McGrath & Cliffe 2011). Furthermore, management of many companies is oriented toward the present and past instead of the future, causing many companies to wait an excessively long time before undertaking concrete actions and thus losing valuable time (Govindarajan & Trimble 2011). New business models are often unappealing to both internal and external stakeholders and accordingly receive only limited support (Johnson *et al.* 2008) or are in direct conflict (cannibalize) the existing business model. However, some firms apply adjustments to their business model based on changed conditions three times faster than average (Nunes & Breene 2011).

Despite uncertainties, there is, in practice, common understanding that the business model concept is useful and important in many constellations of entrepreneurial activities (George & Bock 2011). Understanding the business model concept in its entirety is viewed as the most important prerequisite for its correct usage (Casadesus-Masanell & Ricart 2010; Demil &

[30] Hereby, the usage of "the business model as a concept" is confirmed within the present article.

Lecocq 2010).

3.4. Other relevant terminology

This section discusses the terms *innovation* and *strategy* since they are often associated in the literature with the term business model and exhibit clear overlapping content relationships (e.g., business model innovation).

3.4.1. Innovation

The term innovation can be explained in two ways. On one hand, the term has an important role in the innovation of business models but is often misunderstood and thus used incorrectly in this framework. On the other hand, the term is not uniformly defined in the science itself, which, in turn, explains why its transfer to the business model literature is not uniform.

The term innovation literally means "novelty" or "renewal". Schumpeter first introduced the term into the philosophy of science and popularized it in 1939 (in his work *Business Cycles*; Schumpeter 1939). According to Schumpeter, innovation is the source of added value (Schumpeter 1939). The scientific literature contains different definitions of innovation. Freeman (1982) differentiated between innovation and invention, similar to Schumpeter, indicating that innovation is not merely an invention but also its implementation in the form of a technical or organizational innovation. Pfeiffer (1980) described the successful conjunction of potential (i.e., technical possibilities or problem-solving potential) and demand (i.e., economic application or usage) as innovation, further stating that something "new" must appear on at least one side. According to Drucker (1985), innovation must be at the core of corporate actions. The realization and management of innovation is the task of innovation management (Drucker 1985).

The discipline of innovation management has a long tradition with respect to the analysis and structure of innovation processes. In the middle of the 19th century, the first concepts focused on "technology push", followed by a period of innovations based on "market pull" (Rothwell 1994). Later studies found that the innovation process rarely runs linearly and is instead characterized by discontinuity (Tushman & Anderson 1986) and, in some aspects,

can even be described as chaotic (Cheng & van de Ven 1996). Since companies have aimed to set up more structured approaches for the efficient and predictable use of innovation resources in recent years, they have established and expanded corresponding (linear) approaches that include appropriate feedback loops and alternative options.

It is clear that innovation is a key factor for competitiveness and progress (e.g., Knyphausen-Aufsess 1995; Pfeiffer 1971). It provides a fundamental building block for the success of companies, economic development, and, ultimately, the entire wealth of nations (Abernathy & Clark 1985). For companies, innovation requires regularly testing existing structures for adequate innovation and checking and possibly adapting the business processes and the offered range of services accordingly (Foster & Kaplan 2001). With respect to the objective of business plans, innovation can focus on different areas or dimensions.

Schumpeter (1939) distinguished five types of innovation forms (Schumpeter, 1939): (1) new products; (2) new (production) methods; (3) new supply sources; (4) development of new markets; and (5) new forms of organizing the business (i.e., reorganization of the industry). Each type of innovation has a different competitive effect, creates different markets, and calls for different responses (Markides 2006).

In the past, the literature was primarily concerned with the first two forms (Casadesus-Masanell & Zhu 2013). In recent years, a significant increase in the other types' importance and acceptance has been observed. Specifically, "new forms of organizing the business", the final type of innovation, is the direct starting point for the subject of business model innovation, which is also known as strategic innovation (Markides 2006). Initial studies have shown that this kind of innovation exhibits the most sustainable effect, but from the corporate perspective, the risk involved with business model innovation is significantly greater than that for a product or process innovation (Sosna *et al.* 2010).

All forms of innovation concern something "new". However, the connection of innovation with the word new is a source of confusion in the literature. What makes something new? Alternatively, how much change is necessary before innovation comes into play? It is meaningful to briefly outline two approaches to the clarification of these questions.

For the first approach, the Organisation for Economic Cooperation and Development

(OECD) developed a kind of "manual" aimed at contributing to the standardization of all types of studies on the subject of innovation. The manual makes a distinction between the following four categories of innovations (OECD 2005, pp 57-58.): (1) new for the world; (2) new for the industry in the country where the company operates; (3) new for the company; and (4) no innovation. The OECD approach thus considers the term "new" from different subjective viewpoints.

In the second approach, Pfeiffer goes one step further by dividing innovation into subjective and objective innovation (1980). From a macroeconomic perspective, novelty is often objectified with respect to the economy. Herein, this novelty can be a routine matter from the perspective of an international company. As a result, this objective interpretation often leads to dangerous misjudgement within the innovation process (Pfeiffer 1980). A subjective interpretation, or a subjective state of knowledge, is more appropriate for companies to identify and interpret novelties for the company itself or for the relevant market in which the company operates.

A subjective view is assumed in the further course of this article and the overall thesis, which means business model innovation is always considered only from a subjective perspective. While a business model itself can present innovation, a new business model can also promote an innovation (Teece 2010).

Finally, subsequent sections examine disruptive innovation since it is becoming increasingly important in the framework of business models in the literature. This term was coined in the 1990s with a focus on disruptive technologies using the example of power storage devices (Bower & Christensen 1995; Christensen 1997). Later, the concept was expanded to include business models through the transfer of available technologies to business model innovation (Dewald & Bowen 2010). General disruptive innovation is understood as innovation, which leads to a strong change in the market and can also result in entirely new markets (Christensen 1997; Johnson *et al.* 2008). Metaphorically speaking, a disruptive innovation (or even a plurality) can be understood as a rocket that, when fired on an incumbent firm, creates cracks in the existing business model or even the whole market (Wessel & Christensen 2013).

Markides criticized Christensen's generalized approach to disruptive innovation and applied disruptive (technological) innovation transfers to everything. He clearly distinguished three forms of disruptive innovations (Markides 2006): (1) business model innovation; (2) radical (new-to-the-world) product innovations; and (3) technological innovation. Accordingly, a disruptive innovation is an innovation that can create new markets and value-added networks. The process of disruptive innovation extends over a period of time and accordingly has the potential to destroy or replace existing business models, products, and technologies. Disruptive innovations usually appear gradually and are thus initially ignored by many companies (Wessel & Christensen 2013). However, the later the need for change is recognized, the smaller the remaining room for manoeuvring (similar to the *fundamental principle* of Pfeiffer & Weiß).

The most recent findings indicate that a disruptive innovation must overcome the following obstacles before it can change the market in its entirety (Wessel & Christensen 2013):

- Customer inertia (to overcome contentedness with the status quo)
- Problems with technical implementation (can be bypassed by means of existing or new technologies)
- Ecosystem (requires certain changes in the environment such as airplanes not replacing container ships)
- Technology (the required technology does not yet exist)
- Business model

However, the first obstacle is the easiest to overcome and the last is the most difficult (Wessel & Christensen 2013). The more and greater the obstacles, the more likely it is that customers will remain with their current provider (Wessel & Christensen 2013).

Disruptive innovation concerns the discovery of a fundamentally new business model[31] in an existing or new market (Markides 2006). Vice versa, a disruptive technology innovation or

[31] Here, one can also speak of a fundamental business model innovation where radical changes are introduced in the architecture of the business model and its interfaces (Pfeiffer 1980; Zollenkop 2006, p. 131).

product innovation can lead to the need for change or adjustment of a business model, which, in turn, can result in a new disruptive business model.

3.4.2. Strategy

To explain the term strategy, the term business model is frequently utilized in practice, but fails to clarify the meaning (Baden-Fuller & Morgan 2010). One reason for the lack of clarity in practice is that no clear or consistent definition and explanations for the terms *strategy*[32] and *tactics*[33] exist in the literature.

Many works do not sufficiently differentiate between strategy and business model (George & Bock 2011) and between strategy, business model, and tactics (Casadesus-Masanell & Ricart 2010; Casadesus-Masanell & Ricart 2011, p. 107). However, science is well aware of the need for a clear distinction between these concepts (Yip 2004, p. 24).

The differences between strategy and business model can be classified according to the following three topics (Casadesus-Masanell & Ricart 2010; Chesbrough & Rosenbloom 2002; Morris *et al.* 2005; Zott & Amit 2008): (1) competition - strategy aims to achieve differentiation from the competition and to maintain of a competitive edge, and the business model is focused on creation of a superior value proposition; (2) financing - financing is mainly part of strategic planning and is only addressed, if at all, this as an aside in the business model literature; and (3) knowledge - strategic planning often assumes a great deal of reliable information, which is obtained by, for example, environmental and corporate analyses. For the business model, on the other hand, there is the assumption that available knowledge is limited or restricted in its validity with regard to the future.

If strategy is understood as a kind of "end state" that can be reached through planned and targeted action, it is clear that achievement depends on a conscious shaping of the future orientation of the company in terms of the competition (Welge & Al-Laham 2001). The

[32] Porter (1996) defined strategy as "the creation of a unique and valuable position, involving a different set of activities". Similarly, Casadesus-Masanell & Ricart (2010) defined strategy as "a plan of action designed to achieve a particular goal".

[33] The present work does not aim to initiate a discussion on the terms strategy and tactics anew (for further reading, see Grant & Nippa (2006) and Welge & Al-Laham (2001)) but instead focuses primarily on the relevant overlaps and connections with the business model concept.

business model thus represents a (*top-down*-driven*)* result of a targeted and specific shaping decision (Mintzberg 1978). Hence, the business model not only reflects a realized corporate strategy (Casadesus-Masanell & Ricart 2010) but also helps with follow-up on strategy formulation as a construct for substantiation (Zollenkop 2006). Here, one can thus speak of the continuing development of strategy toward the operational level (operationalization).

A business model can be a starting point for incremental changes to various components, whose effect over time[34] can amount to a difference between strategy and the existing business model and thereby trigger a *bottom-up*-driven adaptation of strategy (Chesbrough & Rosenbloom 2002; Zollenkop 2006). Thus, the causes and effects of changes in strategy and business model can vary. Here, the close interaction between strategy and business model becomes evident. Chandler pointed out the interaction and coherence between the corporate strategy and the existing structure with the phrase "structure follows strategy" (Chandler 1962). According to more recent findings (including business process reengineering (BPR)), the phrase can be expanded as follows: "structure follows process follows business model follows strategy" (Zollenkop 2006, p. 99).

Chesbrough and Rosenbloom (2002) made two points regarding an accurate description of what makes a business model different from a strategy: (1) business models always start with value for the customer and construct the business so that it can provide the value and (2) business models are all about the value added and not the creation of value for the shareholder.

Work with business models can benefit from the strategy concept and can transfer elements thereof (Morris *et al.* 2005). In contrast, strategy work may result in important new insights (e.g., through the modeling of a business model) (McGrath 2010).

With respect to business models, the term tactics can only be described through examples in the existing literature, without specifically expressing what it means. It is clear that tactics play an important role in the framework of the business model since they influence how

[34] There are no precise studies on the timing between strategy and business models. It is believed that strategy and business models simultaneously influence each other, both consciously and unconsciously (Zott & Amit 2008).

much value is created and captured (Casadesus-Masanell & Ricart 2010). The choice of business model influences tactics and thus both concepts are directly connected with each other (Casadesus-Masanell & Ricart 2010).

In summary, the distinctions and structuring described above allow for some conclusions (see also figure 6). Strategy forms long-term requirements in the form of specific objectives and determines how they can be reached. This defines the framework for the development and design of the business model in a *top-down* manner. The business model is thus not a simplified image of strategy but a further development of this on an operational and thus more detailed level (i.e., operations).[35] The choice of business model affects the selection of tactics or tactical measures. Conversely, tactics can influence how much *value creation* and *value capture* are possible in a business model. With continuous adjustments of the business model, which lead to incremental changes, an indirect *bottom-up* interaction can take place between the business model and strategy.

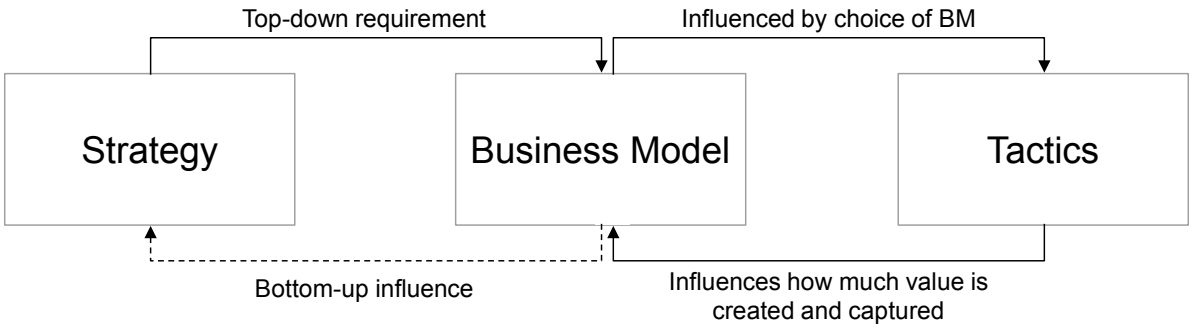


Figure 6: Relationship between strategy, the business model, and tactics (Source: author's diagram)

3.5.Parallels of the business model with other (theoretical) concepts

The concept of the business model lacks theoretical foundation in both economic and classical economic science approaches and studies (Teece 2010). This may be due mainly to the fact that it was simply not necessary to worry about the actual benefits of a product or service for a long time. The simple market rule was: The customer buys the product if the

[35] This is also consistent with statements made by Meinhardt (2002, p. 62).

price is low. The seller delivers when the costs, including a profit margin, are covered. Omnipresent intangible products have undermined this market rule for some time. Customers do not want just a product; they want a solution to a problem. However, the necessary markets for this purpose, in part, do not yet exist (Teece 2010). Nevertheless, the business model supplements the different theoretical approaches (i.e., strategic management, organization theory, and entrepreneurship) in a meaningful manner, especially with respect to drastically changing economic conditions (Amit & Zott, 2001).

Despite the many works on the topic of the business model, a profound theory or the development of such a theory cannot currently be ascertained nor can the concept be explained unambiguously by existing theory (Morris *et al.* 2005). Essentially, the business model concept is based on already established approaches of organizational theories such as strategic management, the resource-based view (RBV), the market-based view (MBV), transaction cost theory, and innovation (Amit & Zott 2001; George & Bock 2011; Morris *et al.* 2005).[36]

From the perspective of the concept of strategic management, the business model bears on Porter's the value-chain concept (1985) and strategic positioning (1996). The business model concept thus also covers competitiveness (Morris *et al.* 2005).

Business model studies contribute to strategic management research because the business model affects the possibilities of a company with regard to *value creation* and *value capture* and shifts these to a focal point (Amit & Zott 2001). The business model concept can thus be seen as further development of the strategy concept (Meinhardt 2002, p. 64).

From the perspective of innovation management, business models can serve to demonstrate, in respective contexts, how technologies and potential inputs can be converted to economic outputs by serving customers and penetrating markets (Chesbrough & Rosenbloom 2002). In a practical investigation, however, it was possible to determine that technological innovation and business models are not directly related (George & Bock 2011). According to Schumpeter (1936), value is created by the new (unique) combination of resources, which generates

[36] For a comprehensive review of the different theoretical approaches with the perspective of the business model, see George and Bock (2011).

innovation. An effective business model includes unique combinations of resources and skills, which, in conjunction with optimal added value, can result in attractive surplus value (profit) for a company, thus providing a consistent link to Schumpeter's theory.

In entrepreneurship, the business model describes or analyzes the theory of "nature and scope" of a company (or its ventures) (Morris *et al.* 2005). From the perspective of an entrepreneur, the business model offers the following approaches and opportunities (Morris *et al.* 2005):

- Conceptualization of *ventures*
- Analysis of the elements for a unique combination of forms
- Development of activities *(sets)*
- Consistency with respect to strategy, architecture, financial growth, and exit considerations

Thus, the business model is a key element of entrepreneurship research (Morris *et al.* 2005), as well as a practical consideration for individual entrepreneurs.

The listed parallels of the business model concept with other theoretical concepts show that the business model concept presents an integrative theoretical approach that draws on various theories.

4. The business model from a systemic perspective

The function and structure of the business model (sections 4.1. and 4.2) follow a static approach, which makes it possible to provide a consistent image of its purpose and different structural elements. This simultaneously creates the basis for dynamic work with the business model (sections 4.3 and 4.4) in the form of various processes and governance in an organization or in the model itself (Demil & Lecocq 2010; Hedman & Kalling 2003). Describing the structure and elements before examining the process refers to an *ex ante* approach in the literature (Demil & Lecocq 2010).

The procedure or structure of the business model in the present article is similar to that of Zott and Amit (2008), who divided description of the business model according to "content,

structure, governance".[37]

4.1.Function of a business model

Explaining the function of the business model must be considered first but is very challenging since few statements and vague ones at that are found in the literature.[38]

Generally, the function of an object describes the task it fulfils. Function thus describes the process between input and output within a system. To determine function, it is necessary to consider input and output (Pfeiffer 1971).

In the following, the aim is not to follow-up on the question of its definition but to determine the function (i.e. role) of the business model[39] and thus its purpose.[40,41] The clarification of the purpose is essential for modeling per se (Baetge 1974, p. 49).

Superficially, this chapter could be concluded at this point with Casadesus-Masanell and Ricart's answer: "The function of a business model is to generate value for the customer." (Casadesus-Masanell & Ricart 2010). However, this superficial observation does not suffice here.

The general function of a business model can be described by way of its characteristics as a tool for management, which facilitates the handling of dynamic business complexities and

[37] Although this approach focuses solely on activities in a business model, a resemblance to the present article can be observed (i.e., content - function; structure - structure; governance - process and governance (control/ regulation)).
[38] Very few literary sources specifically designate the function(s) (i.e., purpose) of the business model and question its actual purpose (exceptions include e.g., Chesbrough & Rosenbloom 2002). Rather, they discuss what a business model is and the elements comprising it.
[39] Within functional systems thinking, the question: "What is this thing?" is not posed, but instead: "What does it do?" (Ropohl 2012).
[40] The purpose of a company describes what function it has in its environment and what it should achieve (i.e., principle or motivation). This can also be described as a tangible objective. Similarly, there are formal company objectives such as profit, profitability, and liquidity. These formal objectives show, in turn, what can be achieved within the purpose. They thus serve a superordinate purpose. Both forms of objectives stand in relation to one another, which means that corporate objectives designate why something is done while a company's purpose describes what is being done to this effect (e.g. Ropohl 1979).
[41] Doganova and Eyquem-Renault (2009) posed a similar question in their 'research policy article, namely, "What do business models do?". They investigated this with respect to entrepreneurship aspects.

allows for effective decisions and actions (Schwaninger 2004).[42]

The specific function of the business model can be described as multifunctional since it is useful for different purposes or objectives. The literature often contains mixed statements about this or does not differentiate it at all. Furthermore, there is no accordance regarding what a business model does and what it should do. Therefore, the functional areas (i.e., the scopes of activity of a business model) are divided into three dimensions in the present work see figure 7)[43]

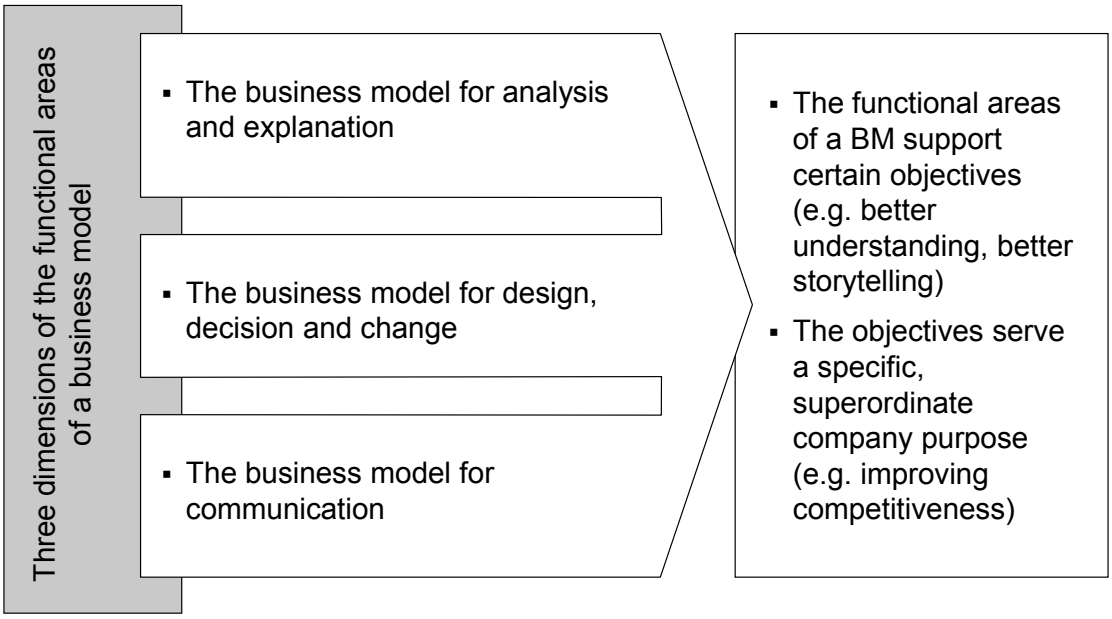


Figure 7: Three dimensions of the functional areas of a business model (Source: author's diagram)

After this distinction, it is possible to ascertain that statements in the literature such as "... a business model has the function of providing a competitive advantage ..." (Zott & Amit 2008) are not sufficient. The business model can only be understood in the context of a superordinate, overall company purpose in which it serves, for example, an analysis tool with the aim of improved understanding of and a clearer distinction from the competition.

4.1.1. Analysis and explanation of the business model

In their literature review, Zott *et al.* (2011) demonstrated that a business model can be viewed

[42] Based on the discussion in section 3.2.2.
[43] These were derived from Schwanniger's model types (see section 3.2.2) and are consistent with the existing business model literature.

primarily as a new unit of analysis. Specifically, a business model has the function to describe how a business works (Amit & Zott 2001; Magretta 2002; McGrath 2010; Zott *et al.* 2011) and thus how the company can succeed in generating a benefit for the customer (Teece 2010).

A detailed analysis and description of the structures within a business are necessary for this purpose (George & Bock 2011; Morris *et al.* 2005). Furthermore, the business model should offer an overview of a company (Amit & Zott 2001; Magretta 2002; McGrath 2010; Zott *et al.* 2011) and can be used to determine its position in the network *(value network)* (Chesbrough & Rosenbloom 2002) or enable problem analysis. As shown above, the advantage of a model becomes evident since only with the help of a model can the complex world be simplified insofar that an overall perspective is possible.[44] With the help of this wider viewing angle, the relevant *ecosystem*,[45] in which a company operates its business, can also be considered (Amit & Zott 2001; Zott *et al.* 2011). This, in turn, ensures a holistic view. The need to consider the *ecosystem* of the business model is a given since this significantly influences it model (Demil & Lecocq 2010). [46]

Analyzing the business model establishes a basis for better understanding and thus for a better explanation of contexts. On one hand, it becomes clear what the value is (Teece 2010; Zott & Amit 2008) and what internal expertise and resources are available[47] (Morris *et al.* 2005). On the other hand, the business model assumes a critical role in understanding this value (Amit & Zott 2001). In the end, from a function point of view, the business model can serve as a basis of explanation for why some businesses are more successful than others

[44] For more on this, see section 3.2.2.
[45] Systems thinking does not distinguish between environment and surroundings because from this point of view, all relevant adjacent systems and connections are equally important to the main system. The term environment is even partially omitted since it could be reason for confusion with the ecological aspect (Ropohl 2012). The literature speaks primarily of environment whereby the term ecosystem is receiving increasing attention. This refers to the relevant business surroundings (i.e., supplier and customer) (Moore 1993). In the present article (thesis), the terms environment, surrounding and ecosystem are equated.
[46] In the literature large gaps can be detected because there are few studies on the interface between the business model and its environment.
[47] Here, overlaps with the RBV can be recognized, where the business is regarded as a bundle of resources and capabilities.

(Zott & Amit 2008).

In simpler terms, the business model function of analysis and explanation can, figuratively speaking, be described as a map that contributes to better understanding and orientation (positioning) in daily business.

4.1.2. The business model for design, decision, and change

While the above-mentioned tasks are mainly concerned with analysis and explanation of the business model in terms of position determination, the activities described in the following focus more on actions involving the business model. The function of the business model can be divided on the one hand, into the right selection of elements and directions and on the other hand, an operational intermediary function.

Few scholars saw the function of the business model as enabling the ability to identify the right market segment, define the optimal value chain *(value creation)*, and estimate the cost and earning structure *(value capture)* (Chesbrough & Rosenbloom 2002; Chesbrough 2006). Teece (2010) essentially considered two main functions of the business model: *exploration* of new design options and their utilization (i.e., exploitation). From this, it is clear that the business model can serve as an agent for opportunities *(opportunity facilitator)* (George & Bock 2011) or a mechanism for conversion of opportunities *(opportunity exploitation)* (Amit & Zott 2001). It should ultimately develop competitive strategies (Chesbrough & Rosenbloom 2002). This allows a business to both encourage innovation and constitute innovation itself (Teece 2010). This clearly shows that the business model is helpful when testing and enhancing options (ideas) and, finally, when implementing change in an organization. In the end, model considerations and possibly simulations can help avoid expensive trial-and-error testing.

On the operational level, the business model should act as a connecting element between innovation (e.g., technology development) and organizational structure[48] *(value creation)* or between technologies and the market (Chesbrough & Rosenbloom 2002). A business model

[48] Studies have shown that in practice, this function is not perceived the connecting element in this manner (George & Bock 2011).

thus describes how *value capture* of an innovation occurs (Teece 2010) or, in other words, how a company can earn money with an innovation. Here, it becomes clear that in order to realize a benefit *(value)* in the form of an innovation (often technology), a business model is required to reach customers, or the market, and realize economic output (Björkdahl 2009; Chesbrough & Rosenbloom 2002). In some cases, a new technology can be commercialized using an existing business model; however, a new business model is sometimes necessary (Björkdahl 2009).

Therefore, it can be said that the business model fulfils the function of a connector, link, and mediator between input (technology) and output (market, customer, *economic value),* thus realizing the operative business *(operations).* Additionally, it is helpful to structure thought processes and courses of action in view of the operative business and sensibly bundle the concentration and allocation of resources with a focus on benefits in order to increase the overall ability to act and the effectiveness of actions.

4.1.3. Business model for communication

The business model not only aims at a better understanding of the ideal design for a business but is also used for communication purposes.

The business model aims to focus communication, thinking, and action on the value proposition (Chesbrough & Rosenbloom 2002; Osterwalder & Pigneur 2011). It can thus also be used as a "storytelling framework" (George & Bock 2011). Especially from an entrepreneurship perspective, the business model can help a company become aware of innovative ideas and successfully communicate these innovations to the market *(business model as a market device)*. Furthermore, a business model should help entrepreneur and manager present and convey their ideas clearly (Doganova & Eyquem-Renault 2009). Established businesses can also use this raised awareness to pose the right questions about their business at various hierarchy levels, thereby employing the business model as an additional communication element (Magretta 2002). In the end, the use of a business model can promote the formation and usage of a common language within an organization.

In conclusion, during the systems analysis of the business model, we determined additional (systems-oriented) functions. A business model serves to describe the function, structure,

and processes of a business, to deduce specific instructions, and to govern the business in a targeted manner. Similarity to Zott and Amit's (2010) approach regarding the themes of content, structure, and governance is evident.

4.2. Structure of the business model

The structure of a system (in this case, the business model) consists of the nature and quantity of elements and the attachable relations between the elements (Ropohl 1979, 2012).[49]

When working with a business model, it is essential that the structure is understood in terms of its constituents[50], components, elements, and associations (Casadesus-Masanell & Ricart 2010; Demil & Lecocq 2010).

There are two different description levels or depths for the structure of business models. On one hand, there is an abstract or generic description of business models, which is applicable to almost all businesses. On the other hand, there are specific business models for each company, which, in most cases, is assignable to a generic pattern (Demil & Lecocq 2010). The present article addresses the abstract-generic level because there is no investigation of the business model of a specific company.[51]

Even if they represent a simplified image of a company, business models are often complicated and may not be suitable for all forms of application (Baden-Fuller & Morgan 2010). Therefore, it makes sense to distinguish two forms of the structure of a business model (see also Casadesus-Masanell & Ricart 2010): (1) aggregation - a kind of demagnification to inspect the business model from a certain distance and avoid the consideration of details regarding elements and compounds while considering only the essential constituents; and (2) decomposition - decomposition of the model into individual constituents for detailed

[49] Business models may differ in their structures while having functional equivalence (i.e., multiple companies offer the same value proposition).
[50] The constituents of the business model are understood to be value creation, capture value, and value proposition. The various components (i.e., staff or resources) consist of individual elements (i.e., individual processes and machines).
[51] Siggelkow (2002) pointed out that in an investigation of a company's business models, adequate comparison with other companyies' business models must be ensured; otherwise, the impression arises that all the elements of the business model can be assumed to be equal across companies.

analysis, which, depending on the formulated question, can be viewed separately as the according elements and compounds.

An integrated, more abstract, and generic way of looking at the structure of the business model is derived from the two forms in the present article. This perspective is suitable for strategic considerations, especially when it comes to comparisons of aggregate business model structures within an industry. On the other hand, a detailed perspective on the individual components is assumed, which is possible through the deconstruction of the essential constituents. At this level, concrete actions are possible or verifiable (Zollenkop 2006, pp. 44-48). Further subdivision on the company, business unit, or product and service level is conceivable here.[52]

4.2.1. Integrated strategy view (aggregation in a broader sense)

From the various statements in the literature, the structure of the business model can be subdivided into three essential components and aggregated accordingly:[53]

- *Value proposition* - describes what benefit or, in other words, what value is contained in the offer of the company (e.g., Demil & Lecocq 2010; Doganova & Eyquem-Renault 2009; Magretta 2002; Teece 2010)
- *Value creation*[54] - lists the partners and channels through which the value is created or produced and delivered to customers (e.g., Demil & Lecocq 2010; Doganova & Eyquem-Renault 2009; Morris *et al.* 2005; Teece 2010)
- *Value Capture* - is the *bottom line* of a business model and translates the two other areas in terms costs and revenues and shows how the company itself can benefit from the value created. (e.g., Doganova & Eyquem-Renault 2009; Magretta 2002;

[52] For more on this, see Schallmo (2013), pp. 29-33.
[53] Another perspective comes from Morris *et al.* (2013). They divided the business model into the following three areas (Morris *et al.* 2013, p. 48): 1) operating model; 2) economic model; and 3) strategy model. The operating model is equivalent to value creation, the economic model to value capture, and the strategy model to value proposition.
[54] Here, reference to Porter's (1981) value chain approach can be made. This focuses only on the architecture and history of the creation of value and ignores customer benefits and the acquisition of value.

Morris *et al.* 2005; Teece 2010)

The focus of the business model structure hereby clearly lies on the conceptual architecture *(value proposition* and *value creation)* rather than the financial architecture *(value capture)* of a business (Teece 2010). Accordingly, value proposition represents a huge lever for new business models and thus for business model innovation.

Regardless of the configuration of its structure, a business model should always be structured in a way that differs noticeably from the business models of competitors and is thus difficult to imitate (Teece 2010). The goal should be to find a unique structure (combination) that contains enough innovation to be sufficiently protected against imitation (achievement of a certain *proprietary level)* and thus experience success in the market (Morris *et al.* 2005).[55]

The structure and design of the business model are important criteria for business model innovation (Bock *et al.* 2012; Morris *et al.* 2013, pp 47-48*).* Accordingly, an action-oriented perspective on the dissection of individual business model elements is necessary.

4.2.2. Action-oriented perspective (deconstruction in a more narrow sense)

There are different approaches in the literature for the structural deconstruction of the business model and the distinction of individual elements.[56] These approaches usually serve the operationalization of the business model and are referred to as *business model frameworks*.[57] Overall, the approaches describe individual components of a company that are linked to each other and represent its functionality.[58] For the present work, two approaches

[55] The latest studies argue that conceptualization and implementation of a business model is insufficient to achieve a competitive advantage. Formal and strategic intellectual property rights (IPR) methods can, especially in the initial phase of a business model, provide some protection for individual components ,for example, and can improve overall success (Desyllas & Sako 2013).
[56] See e.g. Chesbrough 2006; Hamel 2000; IBM 2006; Wirtz 2010). An approach is understood as a holistic concept when the various business model elements are distinguished and a possible approach to the work or change in the business model is included.
[57] Pateli and Giaglis (2004) analyzed the various business model frameworks and divided them into three different categories: (1) top-down analysis; (2) matrix analysis; and (3) value analysis.
[58] From the literature, Shafer *et al.* (2005) identified a total of 42 different business model components and categorized these into the following four areas: (1) strategic choices (that describe the development of components due to strategic decisions), (2) creating value; (3) capturing value (the

were chosen as examples that not only list and describe the components but also put them in logical order. The most popular approach is Osterwalder and Pigneur's *business model canvas* (2010), and Demil and Lecocq's lesser known ***R**esources, **C**ompetences **O**rganization and **V**alue Proposition* (*RCOV)* framework (2010).

Business Model Canvas

Osterwalder and Pigneur's *business model canvas* (2010) is considered one of the best-known models in science and practice when it comes to the topic of the business model. It can be assumed that precisely because of the global spread of the business model canvas, the business model has experienced broad acceptance and application. This model is convincing due to its simplicity and the logical concatenation of the components with each other. The selection of components is based on the perspectives of the *balanced scorecard* approach and the management literature (Osterwalder 2004).

functions that constitute the two fundamental columns of a venture and a dividing line from competitors); and (4) the value network (in which the company operates).

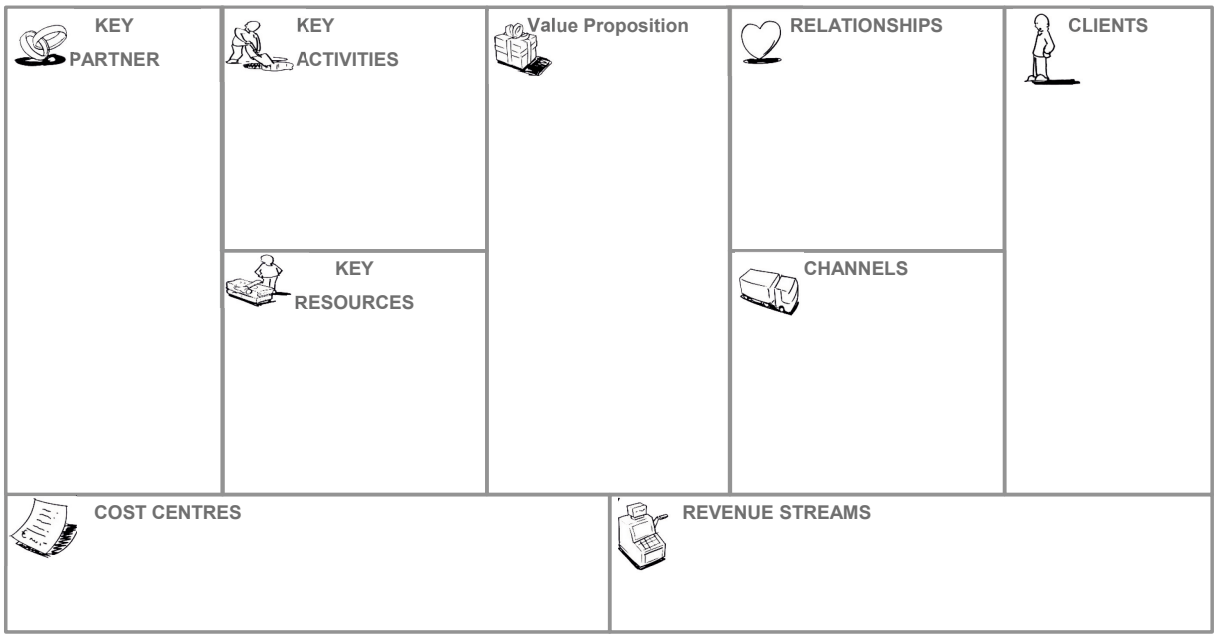


Figure 8: Business Model Canvas (Source: Osterwalder & Pigneur 2011)

The *business model canvas* (figure 8) is very well suited to closely examining the business model and relatively quickly understanding the initial fundamental relationships it entails. Above all, the value proposition stimulates thinking in terms of value and benefit. The focus is clearly on visualization, which means that the underlying complexity of the actual existing structure is insufficiently regarded or even neglected. The question "How do we proceed from here?" arises soon after the *canvas* is completed. It can also be said that the environment and cross-connections are not considered and that no statements about general conditions are made. Here, knowledge of the environment and general conditions is essential because both affect the business model (Chesbrough & Rosenbloom 2002).

RCOV Framework

The RCOV framework (figure 9) was developed by Demil and Lecocq (2010) in two steps. First, they identified the components of the business model and second, they determined how these components change on an organizational level. Taking a view based on the growth and change in the essential core components of a company over time, the process of change and the dynamics between the components can be explained (Demil & Lecocq 2010).

The acronym *RCOV* stands for ***R**esources, **C**ompetences **O**rganization and **V**alue Proposition*. This dynamic originates within the model through the interaction within and among the model

components over time.

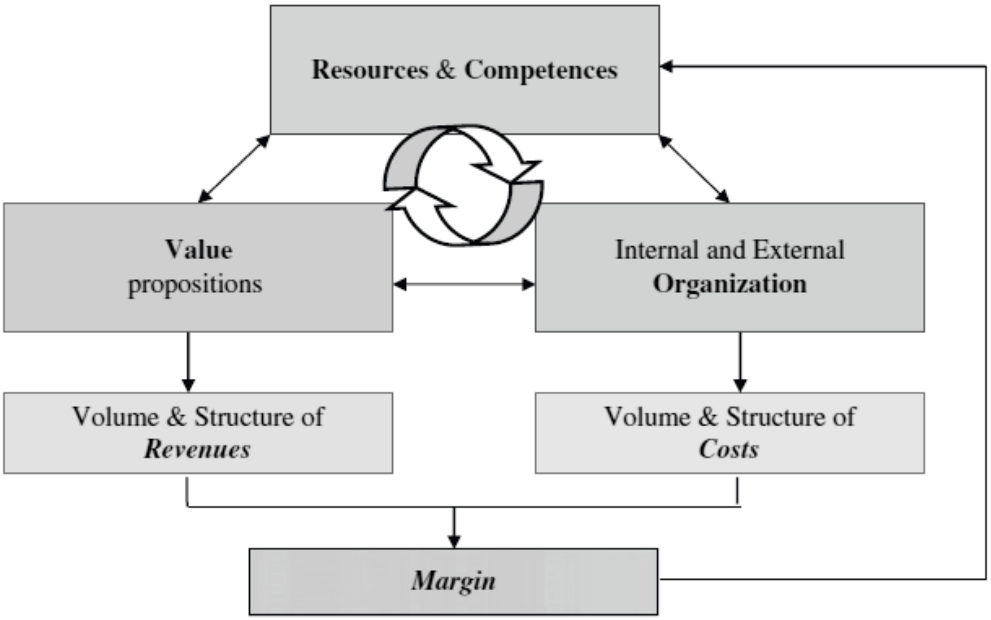


Figure 9: RCOV framework (Source: Demil & Lecocq 2010)

The environment per se is not an integral part of the framework, but it can nevertheless affect every component. The RCOV framework has a systemic nature as it reveals the individual components and their interactions, but in the end, unfortunately remains overly generic.

Mere knowledge of the structure, constituents, components, and elements of the business model are insufficient (Chesbrough 2010) to be able to conclude the work on the business model concept.

4.3. Processes of the business model

After a static examination of the function and structure of the business model, the following discusses the dynamic aspects of its processes and governance. The literature is currently oriented toward the dynamic aspects of the business model (e.g., Bourreau *et al.* 2012; Bucherer *et al.* 2012; Chesbrough 2010). Recent studies have shown that systematic and well-planned procedures are meaningful and necessary, especially in view of successful business model innovation (Achtenhagen *et al.* 2013; Bucherer *et al.* 2012; Giesen *et al.* 2007). The processes within companies concerning the business model, however, still take place rather

unsystematically and unsequentially. Working with business models is frequently considered an event that occurs seldom enough so that no formal processes with clear responsibilities are necessary from a company's point of view (Bucherer *et al.* 2012). This appears understandable from a company's perspective since it has extensive experience and understanding in how a product, technology, or process is innovated (Chesbrough 2010).

A process describes the spatial and temporal realization of a structure (Ropohl 1979). The temporal aspect plays an especially crucial role concerning business model innovations (Bucherer *et al.* 2012). Regarding the economic considerations of business model processes, it seems that scientific investigations and publications are subject to arbitrariness. It is increasingly noticeable that there is no systematic usage of different kinds of business model processes and sometimes entirely new terms are found in the literature.[59]

Assuming that the processes of the business model proceed in various phases, the respective final objective can serve as a criterion for their demarcation. Based on this, it is possible to differentiate between the establishment and usage of business models. Along this division, the process for the business model developed by Bucherer (2010) can be applied, leading to a clear overview (see figure 10).[60]

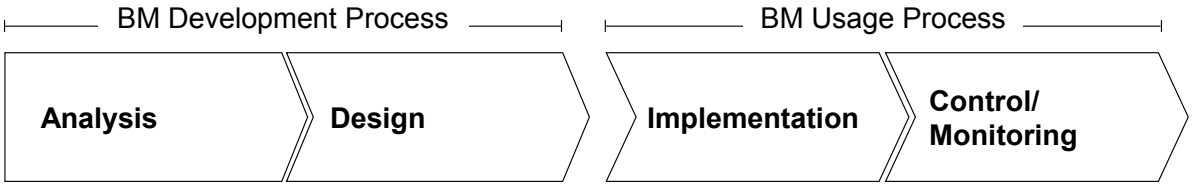


Figure 10: Processes of a business model (Source: author's diagram, inspired by Bucherer 2010)

Furthermore, the literature outlines a variety of additional processes (e.g., Schneider & Spieth 2013; Sosna *et al.* 2010; Teece 2010), which underlines the lack of uniformity. As the processes are similar overall, the proposed structure is appropriate for examining business model processes. A look at the literature on strategy suggests direct similarities and overlaps

[59] In the literature, diverse buzzwords can be found for these processes: rethinking, adjusting, reshaping, reinventing, renewing, inventing, changing, and creating, among others.
[60] The Bucherer's process is appropriate since it is derived from theory and takes meaning from different process models (among others, Cooper's stage-gate model) and has been verified in practice (Bucherer 2010).

in terms of processes (e.g., Welge & Al-Laham 2001).[61]

Within the work on business model processes and the according transformation processes, a duality is noticeable in the processes involved in change between new and old business models. On one hand, there is the development process of a fundamentally new business model *(business model innovation*); on the other hand, there is modification (i.e., the adjustment process) of the existing business model. Companies should adapt, optimize, or reposition their existing business model in reaction to market modifications or disruptive technologies. In parallel, a new and possibly disruptive business model should be established to replace the existing business model in the long term (several years) and accordingly absorb and compensate for disappearing revenue. Overall, incumbent firms should always be concerned with new and existing business models so they can decrease risk (Bucherer *et al.* 2012; Gilbert *et al.* 2012). Since there is, however, a lack of scientific evidence concerning this matter, it overcomplicates the whole process of evaluation and the process is thus primarily considered linear. In contrast, some authors do not view such a division of this process as inevitably necessary for permanent success with a business model (Markides 2006).

The parallelism of the two processes can be mapped as follows (see figure 11).

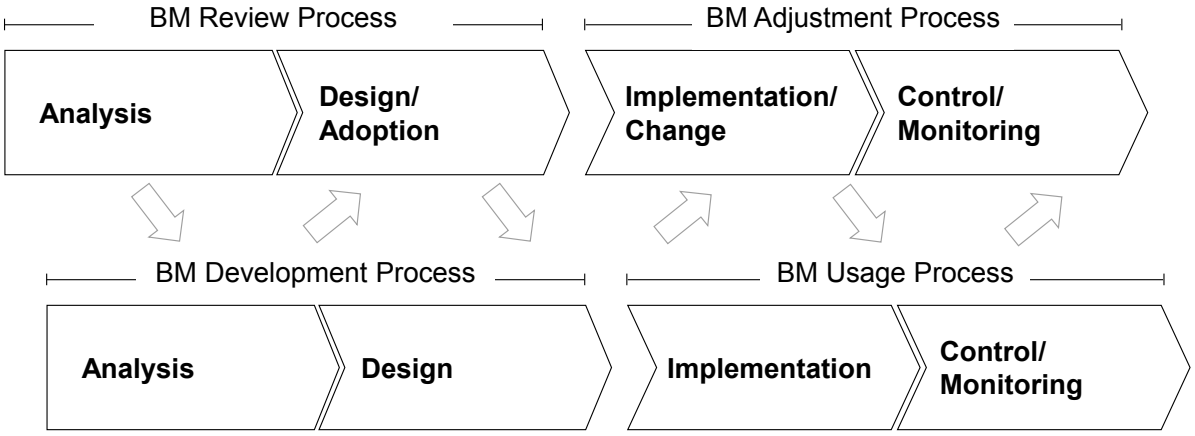


Figure 11: Adapting the existing business model and innovating a new business model in parallel (Source: author's diagram)

[61] Welge and Al-Laham (2002) divided the process of strategic management according to the following steps: goal planning, analysis and forecast, formulation and evaluation, implementation, and monitoring.

The additional processes of the existing business model can be divided into review and adjustment and focus on the existing (old) business model.[62] Through control and monitoring of the usage process, a necessary adaptation of the business model can be observed.[63] Then, a process of creation and usage of the new business model or a new business model innovation process is initiated and executed, which runs parallel to and in coordination with the old business model.[64]

Overall, it is thus possible to distinguish three main processes (review, adjustment, development, and usage process) for business models. The following examines this briefly. The order of the processes describes the approximate sequence that occurs when an existing business is developed into a new business model in parallel to an existing business model.

4.3.1. Review process for an existing business model

An existing business model is shaped by various individual as well as organizational and environmental processes (George & Bock 2011). Since the business model can be understood as an open system from the systems thinking perspective (Johnson *et al.* 2008; Teece 2010; Zott & Amit 2008), it is permanently connected and in exchange with adjoining business models (within a company) and its environment (i.e., surroundings) (Moore 1993; Ulrich & Probst 1991). This is one reason why companies constantly test their existing business models (sometimes by force) and adapt them or develop a new one if necessary.[65] In the literature, this is designated as a *gap* between the business model and the environment, which calls for a new innovative business model.[66] Accordingly, review, with subsequent

[62] At this point, a connection can be drawn to the RBV since the review is carried out according to existing competencies. On this matter, see also Morris *et al.* (2005) and Schneider and Spieth (2013).
[63] For more on this, see section. 4.4.
[64] Another possibility for a business model innovation process for established companies is the acquisition of start-ups with innovative business models (Johnson 2010, pp. 150). This is known and discussed as corporate venturing.
[65] It is meaningful at this point to refer to section 4.4., which deals with the governance of business models, that is, how are business models controlled by the management with the help of objectives and which instruments can be used to regulate in the case of deviation from the desired target value.
[66] It should be noted at this point that a conscious procedure for working with business models is assumed in the course of the overall dissertation. A business model can also develop in a fully evolutionarily manner (Hedman & Kalling 2003) but no longer represents business model innovation (Bock *et al.* 2012).

adaptation or new development, is always carried out in response to internal and external factors (Christensen *et al.* 2010; Demil & Lecocq 2010).

There are three identified directions from which the impulse for change and hence the request for review may come:

- Internal
- Immediate external environment (e.g., industrial parks, geographical hotspots)
- Enlarged external environment (e.g., macroeconomic origin, actions of competitors)

These three areas provide orientation for review and analysis. The following points can be considered internal activators of a review, with corresponding adaptation or new development (Demil & Lecocq 2010):

- Conscious decisions by management
- Independent development of an individual element (e.g., experiences of an employee)
- Interaction between individual elements in a component (e.g., formation of synergies from a bundle of complementary resources)
- Interaction between individual components (e.g., revenue generated from a value proposition transferred to the acquisition of new resources)

Principally, a company will always (have to) change if internal performance (e.g., gain, profit, or margin) decreases or has already reached a low level.

The business models of companies located in geographical *hotspots* (e.g., technology parks or campus initiatives) are demonstrably influenced (positively or negatively) by the immediate external environment. Overall, location in a hotspot can provide competitive advantage in terms of knowledge of other companies operating nearby (Borgh *et al.* 2012).

The more radical the innovation is in the enlarged external environment (e.g., macroeconomic changes), the more challenging and the greater the necessity for changes to the existing business model (Teece 2010). Product or process innovations by the competition

can also lead to an adjustment and sometimes innovation of the business model. This, in turn, has a direct and significant effect on a company (Bucherer *et al.* 2012).

Incumbent firms often have immense problems when adapting or changing their existing business model (Teece 2010). This may be because any kind of adaptation process in their business model have a demonstrably negative effect on strategic flexibility and thus on the ability to discover new innovations as opportunities (Bock *et al.* 2012). Furthermore, incremental and continuous changes may be more common than radical changes in these companies. Radical change of a business model can take place as incremental change or be driven by the accumulation of many small changes (i.e., decisions and improvements) Demil & Lecocq 2010).[67] In the end, it appears that companies often lack specific approaches, knowledge, and experience in handling business model innovation.

Companies that are faced with, for example, a disruptive business model innovation of another competitor in the market, may have the following responses or reactions (Dewald & Bowen 2010):

- Inaction
- Resistance
- Adaptation
- Resilience

Dewald and Bowen (2010) recommended that small and medium businesses should endure and wait for developments. In their opinion, it is too late for small businesses to react or catch up with new business models. Instead, the companies should make adjustments and do what is absolutely necessary in order to survive instead of trying to change the market in the long term by means of innovative business models (Dewald & Bowen 2010).[68]

[67] Different statements can be found in the literature as to whether a fundamental innovation (of a business model) can be achieved by incremental changes. From the perspective of the author, incremental changes only serve as optimization in small steps. This can, however, be insufficient for makor leaps in innovation and thus fundamental innovation is of the highest priority, even within business model considerations.

[68] See also figure 1 in the introduction chapter of this thesis.

In summary, it can be noted that an existing business model is permanently influenced by internal and external forces and, accordingly, must continuously adapt (Christensen *et al.* 2010; Demil & Lecocq 2010). This can be achieved, among other means, though a continuous learning process (Sosna *et al.* 2010) or a *trial-and-error* process (McGrath 2010; Smith *et al.* 2010; Sosna *et al.* 2010). Already today and increasingly so in the near future, the success of companies (and entire nations) will depend on their ability to develop new business models (Teece 2010). Therefore, it is necessary to position the development and creation of innovative business models on the same science- and practice-oriented levels as technology development, entrepreneurship, and management.

4.3.2. Development process (business model innovation as a process)

The development process describes the procedure of how a new innovative business model is created. Here, the majority of the literature refers to the business model innovation (BMI) process (e.g., Bucherer 2010; Bucherer *et al.* 2012; Sosna *et al* 2010).

"Business model innovation is the discovery of a fundamental different business model in an existing business." (Markides 2006, p. 20). "…we define business model innovation as a process that deliberately changes the core elements of a firm and its business logic." (Bucherer *et al.* 2012, p. 184). This is not about finding new products or services but rather completely redefining the existing structures and their connections and ultimately bringing new benefit to customers (Markides 2006).

Only few companies currently have an *end-to-end* BMI process although creating innovative business models faster while maintaining control of the complexity would be helpful (Bucherer *et al.* 2012). It is increasingly clear that business model innovation is pursued not only by start-ups but also increasingly by incumbent firms (Bucherer *et al.* 2012).

In the literature, an experiment-based approach is predominantly proposed for the development process (Baden-Fuller & Morgan 2010; Chesbrough 2010; McGrath 2010; Sosna *et al.* 2010). McGrath noted, "Experimentation is key" and argued that with excessive uncertainty in the creation process of the business model and a lack of predictability of concrete (success) figures, it is only meaningful to develop innovative business models through experimentation. Her "discovery-driven-process" is aimed at ensuring as much

learning and development as possible at the lowest possible cost (McGrath 2010). This approach is appropriate from a financial viewpoint because an experiment gradually develops a business model (first through market and industry studies and second with a rough design...) and concept before they are implemented. However, this approach is not new; new business models always undergo a conceptual and beta, or pilot, phase. In addition, this approach neglects the fact that a large number of studies have been unable to determine the probability of success of new business models before they are put into practice. Nevertheless, every new business model is an experiment in some way as its suitability for practice has yet to be proven.

However, companies should not rely only on experiments to ensure they are generally moving in the right direction (Bourreau *et al.* 2012). They should also not rely too much on external partners (e.g., consulting firms and research institutes) because this demonstrably reduces their ability to search for new innovations (Bock *et al.* 2012).

Sosna *et al.* (2010) provided another approach to the creation process of new innovative business models. Their approach shows how a new business model can be created in parallel to an existing business model that continues to provide revenue and profit when external changes will force an adjustment in the near future.

There is a clear distinction between the conceptualization phase (*exploration*) and implementation phase (*exploitation*) (Sosna *et al.* 2010):

- Exploration (initial business model design and testing)
- Exploration (business model development)
- Exploitation (scaling up and refining the business model)
- Exploitation and further exploration (sustaining growth through organization-wide learning)

Overall, this approach is well suited for the development of a new business model because it is comprehensive and integrated. However, comprehensive (empirical) proof that the

widespread application of these processes is successful is still outstanding.[69]

Generally, however, achieving basic business model innovation[70] should always be attempted during the creation process of a new business model. Since fundamental changes to existing solutions and thus drastic improvements can only be achieved through basic innovations, this ensures a respective long-term competitive advantage (Pfeiffer 1980).

Within the creation process, one of the greatest difficulties is ensuring the concurrency and compatibility between old and new business models. Here, organizational difficulties can arise through the transfer and deferment of resources between the business models (Chesbrough 2010).

4.3.3. Usage process

It can be assumed that the usage of business models follows rational action for a certain purpose. Accordingly, the objective function[71], which describes the relationship of all relevant objectives, including their contributions to an enterprise, should be demanded. Depending on how the question of the choice of objective function is posed, the usage process will vary.[72] With respect to the usage of an innovative new business model, the difficulty is that the objectives for innovation are generally not a given and instead need to be developed (Hauschildt 2004, p. 350).

In the existing business model literature, there is no clear and recapitulative statement on the objective function of business model innovation (i.e., which corporate objectives directly or indirectly cause business model innovation). This is surprising because without knowledge of objectives and their differentiation, it is difficult to achieve successful business model innovation and integrate it in the objective system of a company and its innovation activities. Business model innovation is shaped by the focus and objective of a particular innovation (Koen *et al.* 2011).

[69] In their work, Sosna *et al.* (2010) only applied this process to a single company (single case study) and realized a limitation in the generalizability of their results.
[70] It is possible to distinguish between a gradual and a principle business model innovation (Pfeiffer 1971; Zollenkop 2006).
[71] The following terms are subsumed under this: objective, sense, aim, theme, and objective system.
[72] For the various functions of a business model, see section 4.1.

Brief analysis revealed a common belief in the literature that the renewal of the underlying core of business logic is one of the essential objectives of business model innovation, with the sub-objectives of adapting to external uncertainties and preparing for future changes (Schneider & Spieth 2013). Furthermore, renewal of the value proposition should lead to realization of new business opportunities and possibilities for all parties involved (Zott & Amit 2010). Change in the corporate core (value proposition) results in an adjustment to value creation, which should be as consistent as possible with respect to economic as well as socially strategic objectives (Zott *et al.* 2011). This clarifies that an appropriate hierarchy of objectives is necessary and helpful.

However, prior to successful and objective-oriented business model innovation, the new business model must be implemented according to the analysis and design phase. The objective of this stage is to transfer the developed business model (concept) into reality, to initiate the appropriate measures and projects, and to collect corresponding experiences along the way. Many companies enter new ground during this stage. As part of implementation, it is appropriate to implement the business model in a test market before it rolled it out to the market as a whole.[73]

The timeframe for the entire implementation process should not be excessively long. Studies have shown that a brief and rapid introduction (i.e., a big bang approach) provides a clear competitive advantage for fundamental business model innovations (Bourreau *et al.* 2012, p. 418).

The last phase of the usage process consists of control and monitoring. This involves corresponding guidance and the management of business models and thus the entire business or company. Here, relatively few references can be found in the business model literature. While there is sufficient literature on management, the concept of the business model and its correct usage is still a new topic. The majority of the literature on the topic merely points out that controlling and monitoring are important for determining the success

[73] Daimler's successful urban mobility concept Car2Go is provided here as an example. It was tested as a new business model in the context of a pilot project in the city of Ulm before it was rolled out nationally and internationally (Schallmo 2013, p. 152).

of implementation and accordingly observing continuous internal and external changes (Bucherer *et al.* 2012, p. 190; Schallmo 2013, pp. 234-237). How exactly this should be carried out is visited only briefly. The next section examines this issue in the context of the governance of business models.

4.4. Governance of the business model

The aim of this section is to demonstrate the role of governance[74] and, in particular, the control and regulation of business models. In other words, what role do guidance and management play in business models?

Since business models represent dynamic wholes that do not remain the same but rather change continuously, they behave in various ways.[75] The ability to keep a business model under control or achieve a specific objective with business model innovation is known as governance. Management should keep the environment of a business model continously monitored (Ulrich & Probst 1991).[76]

A recurring question is how to ensure that all relevant decisions regarding function, structure, and processes are adequately reflected in actions that are undertaken. The terms "guiding principles" and "rules" are used in the business model literature (e.g., Morris *et al.* 2005). The term regulation that is used in the present work comes from cybernetics and is thus unrelated to instructions with respect to content (rules*).* Regulations are intended to help avoid strategic and tactical changes that are inconsistent with the set (targeted by control) objectives of the business model.

Control and regulation are two distinct processes with the same purpose, which can be understood here as the successful management (governance) of business models. The

[74] The term governance originally comes from cybernetics (the theory of dynamical systems), where it is also referred to as control theory.
[75] A business model and thus the venture itself can only acquire an optimal and balanced state with respect to its environment by accident because the environment (1) is changing continuously and (2) is subject to permanent internal changes of a company (i.e., it is driven by learning processes) (Baetge 1974, p. 17).
[76] Planning, realization, and monitoring are understood as classical leadership targets (Baetge 1974, p. 16).

following briefly considers both processes.

4.4.1. Control

Control is targeted behaviour that influences the performance of a system through instructions to act in certain ways (Ulrich & Probst 1991).

Based on a company's strategy, management determines how the business model should be designed or what it should achieve (Casadesus-Masanell & Ricart 2010; Casadesus-Masanell & Ricart 2011). Objectives are defined and the company is accordingly controlled so that the predetermined strategy is realized as best as possible. Here, which functions the business model should meet must be considered since, as shown above, different functions allow for different control processes.[77]

Control of business models is designed to orient future processes toward given objectives using concrete instructions. This requires the anticipation of potential consequences from internal and external influences on the business model (Demil & Lecocq 2010). A close link between strategic analysis and business model analysis and design is necessary to draw the right conclusions from possible market developments and protect the business model through a variety of "isolating mechanisms" (Teece 2010).

In short, the controlled, clear objectives of a strategy must lead to concrete instructions for operational events. The business model can be used for this operationalization (i.e. deployment). Through an overall view of what a business model provides, it soon becomes clear which objectives influence which constituents and components of a business.[78] Effective operational control is possible only by the mapping of the business in a model.

4.4.2. Regulation

Regulation is a process in which an influencing factor is compared to a guiding factor (objective) and, depending on the result of the comparison in terms of assimilation to the

[77] See also section 4.1.

[78] Here, parallels to the balanced scorecard can be recognized, which could be newly revived as a whole by the business model. The business model canvas was originally derived from the balanced scorecard (Osterwalder 2004).

guiding factor, affects the business model (Ulrich & Probst 1991). In other words, in an economic sense, this concerns the monitoring and control of operational processes.

Two steps can be deduced for the management of business models with regard to dynamics (Demil & Lecocq 2010):

- Permanent monitoring and supervising of the internal as well as external risks and uncertainties that may have potential impacts on the business model
- Transfer of results in decision proposals for management with regard to adjustments (regulation) within the business model

In sum, it is the role of management to maintain "dynamic consistency" (i.e., the ability of a permanent balance (fit) between the business model, its components, and ever-changing reality) through incremental or radical changes (Demil & Lecocq 2010). If the regulation and adaptation that take place are close-knit it allow fast reaction. Furthermore, it can be assumed that changes to the business model will generally occur more on the incremental level than in the form of radical change (Demil & Lecocq 2010). This considerably simplifies management's work and provides calmness and continuity within a company. Nevertheless, a company will not be optimized in the long term with incremental changes and will not be able to avoid a radical change (e.g., through fundamental business model innovation).[79]

In summary, governance plays an essential role within companies and specific control and governance with the capability for rapid response are fundamental, especially for business model innovation.

Especially in large companies, a simplified image of reality—the business model—can be used to clearly represent and understand governance measures in the form of control and regulations and achieve a set of corporate objectives. With regard to possible external disturbance factors, simulated control methods can be applied and tested within the framework of the business model.

[79] The need for fundamental business model innovation has already been repeatedly demonstrated.

5. Conclusion and outlook (future research)

The present work aims to answer the question: "How can the concept of the business model be described extensively and clearly from a systemic point of view based on the current literature?"

For this purpose, a linguistic analysis of relevant terms was conducted as a first and necessary step within the framework of theoretical preliminary considerations. This resulted in important insights, particularly regarding the term *model*, which were relevant for the subsequent examination. With respect to the selected business model literature, it is clear that it is an emerging research field with unclear language that lacks theoretical basis. Through systems-oriented analysis (i.e., systemic structuring of the business model concept) it was possible to determine that the literature is predominantly occupied with the question of what a business model is. However, it ultimately goes into little detail on what the business model does or what objectives it seeks to fulfil. For the structure of business models, it is difficult to grasp the entire bandwidth that is available in the literature. Here, it becomes clear once again that there is a lack of uniformity. Regarding the process perspective, research has gained considerable momentum over the past couple of years. Companies are posing the questions of how existing business models can also be successful in the future and how entirely new innovative business models can be developed. Science has attempted to provide an answer with various process proposals. It is clear that the various approaches share many similarities, which is because these processes were predominantly derived from other innovation processes (e.g., the product innovation process). There is often a lack of evidence to indicate that these process propositions function in broader practice. Since the empiricism of these works is mostly based on simple case studies, there is a lack of generalizability. In the area of governance of business models, the business model literature offers no approach for successfully managing business models or answer to the question of how management practice changes through the use of business models The reason for this may lie in the lack of differentiation from "normal" strategic management activities. Overall, companies face many changes and a great deal of uncertainty and must permanently control (against) and regulate (anew) to maintain the existing business model and thus keep

business on course.

Overall, the literature shows that the business model concept can be described from a systemic point of view and that insights can be revealed from this description. The systems approach (view) helps create a clear framework for thought and action and thereby provides a more structure and clarity, especially for current issues that are difficult to grasp such as that of the business model.

As part of this article, a number of gaps were identified in the existing literature that deserve further exploration. It is evident that the business model as a concept has had very little exposure to the internal dynamics of companies or external changes in the environment (e.g., Morris *et al.* 2005). There are few concepts that account for interactions within and outside of a company as well as interactions with business models. At first sight, approaches from systems thinking (i.e., function, structure, process, and governance view) seem appropriate. Furthermore, it is clear that there are differing opinions concerning which role strategy and the corresponding business objectives play in business model considerations. This raises the question of interactions between these two areas. The review also revealed difficulties concerning translation from the concept level (a business model developed on the "drawing board") to the real world. How this interaction can be solved conceptually remains an open question, especially with respect to time pressures, which prevail in the innovation of business models. Despite some approaches to business model innovation processes, there is still a lack of both practical examples from different (specific) industries and proof as to whether these processes and concepts pass the broad practice test. In these considerations, one possibility is the combination of the diffusion of thought with the business model to thereby obtain new insights for action through the translation of concepts and reality.

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CONTRIBUTION OF SYSTEMS THINKING TO BUSINESS MODEL RESEARCH AND BUSINESS MODEL INNOVATION

1. Introduction

"The system concept can be a useful way of thinking about the job of managing" (Johnson *et al.* 1964, p. 367). Systems thinking (ST) has a long tradition (Ackoff 1962; Beer 1966; Churchman 1968) and several origins (Bertalanffy, 1956) and represents a point of view rather than a method (Johnson *et al.* 1964). In recent years ST has been revitalized so that researchers can better understand increasingly complex structures and disruptive changes within firms and the environments in which they operate. ST can thus support decision-making processes. Fundamental ideas about systems have not significantly changed over recent decades and are currently being revitalized in innovation research (e.g., Dodgson *et al.* 2011; Galanakis 2006) and strategic management discourse (Laszlo *et al.* 2009; Warren 2005; Weil 2007).

Due to changing markets and environmental forces, firms are constantly rethinking their existing business models. Every company has a business model (BM) (Casadesus-Masanell & Ricart 2010; Teece 2010) that provides a source of competitive advantage (Markides 2008) and articulates the economic logic of the firm (Chesbrough & Rosenbloom 2002; Teece 2010). Furthermore, the business model is a system of interdependent activities (Zott & Amit 2010) and is manifested in the causal relationship between choices and consequences (Casadesus-Masanell & Ricart 2010). The term *system* represents a set of interacting elements with relationships (Bertalanffy 1956) and covers a broad spectrum of concepts and approaches (Johnson *et al.* 1964). Although the business model is referred to as a system, (e.g., Teece 2010; Zott and Amit 2010), works that do not directly deal with business models also explain the characteristics and meaning of the term *systemic* in combination with business models. Clear evidence increasingly supports the existence of cross-fertilization between ST and business models. Therefore, it is necessary to understand the philosophy of ST to comprehend its benefits for business model research and practice work (Petrovic *et al.* 2001; Renz 2007).

Current research lacks insight on how ST can be applied to business model innovation (BMI). Accordingly, our article seeks to bridge this gap by applying ST to BMI. The article is guided by theory and focused on practice in order to make clear contributions to both fields by addressing the following research question: How can ST contribute to business model research and business model innovation? To answer this question, we first provide a compact review of ST approaches within the systems theory literature. Second, by applying ST to BMI, we contribute to theory and practice in order to stimulate the field. Additionally, we demonstrate that ST can act as a theoretical anchor point in business model research as suggested by Zott *et al.* (2011).

This article comprises two sections. The first section, we focus on existing literature in the fields of systems theory and business models and extracts common points within the different approaches to make contributions to theory. In the second section, we explore the different application levels of ST. After evaluating these perspectives, we apply one system approach to an illustrative case. Based on the findings from this case, we derive initial insights and provide recommendations for directions of future research.

2. Systematic literature review approach

We based the present work on a comprehensive literature review (Boote & Beile 2005; Hart 1998) in the fields of systems theory and business model research. We first reviewed the systems theory literature, which has a historical tradition with different strands of ST and varied perspectives on how to group these strands. A great deal of research on ST and practice has been published since Bertalanffy's (1956) work on systems theory. We used existing literature reviews (Cabrera 2006; Midgley 2003) to gain an overview of the diverse strands of ST and the many system approaches and focused on the most relevant studies for academia and practice. Second, we mapped the relevant approaches by defining categories (i.e., function, cybernetics, integration) and determining the dominant focus of each approach. Third, we identified a systems approach that can be applied to business model innovation. Fourth, we reviewed the business model literature in management journals ranked C or above located in the EBSCO Business Source Complete when searching for the keyword "business model" in the title or abstract.

The present work present the challenge of reviewing the literature of two extremely different and broad areas. Great confusion has arisen in systems literature over the past two decades regarding similar concepts such as ST, systems science, systems theory, system dynamics, and systems methods. Furthermore, there is currently no shared understanding of the business model in academia (Zott *et al.* 2011), which makes it difficult to find a common starting point in this field (George & Bock 2011).

3. The promise of systems thinking

3.1. Overview of systems thinking and application fields in management

In early works on different systems theories, the term *systems thinking* is not present. Around the 1980s, the term emerged (e.g., Checkland 1981) but was used inconsistently; hence, there is no clear and agree-upon definition of the term systems thinking (Forrester 1994). From an ST perspective, the world is systemic; emergence and interrelatedness are the fundamental ideas of this perspective (Flood 2010). ST is a way of thinking with the aim of simplifying understanding and hence decision making; it is a prerequisite for successful action in a complex world. Furthermore, ST can be considered a scientific concept (Bertalanffy 1956; Johnson *et al.*, 1964). In short, ST is an influential mode of thought that uses systems thinking approaches (equal to system approaches and system methods) for modeling social systems (see also Flood 2010; Skyttner 2005).

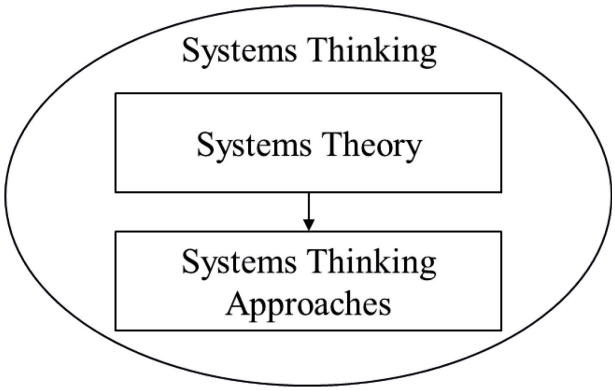

Figure 12: Connection of different systems thinking terms (Source: author's diagram)

However, ST is more than the use of casual loop diagrams (i.e. visualizing how different variables in a system are interrelated), as explained in *The Fifth Discipline* (Senge 1990); rather, it is a starting point for model conceptualization (Forrester 1994). The aim and promise of ST is to provide a better big-picture view and help dissolve complexity (Johnson *et al.* 1964) without breaking phenomena into single parts due to a functional orientation (Flood 2010). Employing the systems perspective and understanding ST require seeing the forest (of relationships), not only the trees (Richmond 1987). Finally, from the perspective of ST, Aristotle's statement, "the whole is greater than the sum of its parts", gains extended meaning because "greater" here represents the interrelationships between single parts (Ropohl 2012).

ST emerged from the need to help researchers and practitioners transform the daily chaos of events and decisions into an orderly way of structuring situations and creating a common formal starting point for different perspectives. Recently, numerous studies have used ST in innovation management to deal with complexity (e.g., Dodgson *et al.* 2011; Galanakis 2006). Furthermore, several studies have addressed the effectiveness of ST application (Cavaleri & Sterman 1997; Huz *et al.* 1997; Maani & Maharaj 2004). These studies concluded that the application of ST is productive and worthwhile and results in significant shifts in participants' goal structures, change strategies, decision-making processes, and task performance. Additionally, they observed greater alignment of participants' mental models and better understanding of system structure, both of which are prerequisites for the development of robust business strategies (see also Maani & Maharaj 2004). However, a gap remains regarding empirical research on the efficacy of ST.

3.2. Review of the systems thinking literature to determine an applicable approach to business model innovation

The origins of ST, from which its main concepts are derived, are general systems theory (GST) as a metatheory (Bertalanffy 1956) and cybernetic theory (Ashby 1956; Wiener 1954). ST received much attention in 1972 with the publication of *The Limit to Growth*, which used system dynamics to create scenarios for future global development (Meadows 1972). Several theories have developed from GST, including operations research, informatics, and

organizational theory. These theories are similar in their functional and structured abstraction, usage of models for constructions, and mediation between theory and practice (Ropohl 2012). System dynamics became more popular after publication of *The Fifth Discipline* (Senge 1990), which focused on dynamic problem solving and improved learning in complex systems and organizations. Senge (1990) argued that becoming a learning organization requires five disciplines; the fifth is ST. During the past two decades, many popular systems thinking texts have been published, and ST has become a necessary skill in many higher management education programs (Cabrera 2006). Nonetheless, ST is still a niche topic with high growth potential in science, business, and organization (Checkland 1999; Laszlo *et al.* 2009).

Two major viewpoints on systems distinguish the different system approaches. First, *thinking about systems* encourages thinking about real systems by focusing on real-world entities (e.g., health systems or accounting systems). Second, ST as a conceptual construct calls for inquiry into real-world entities, which assumes that the social construction of the world is systemic (e.g., Cabrera 2006; Flood 2010). These approaches represent forms of applied systems thinking and are known as *hard* ST (seeing the world as a system) and *soft* ST (looking at the world systemically (Checkland 1981; Jackson 1991). Both views have relevance and significance, but for the purposes of research in the social sciences and management fields, soft ST is more appropriate.

This discussion illustrates that ST is an influential mode of thought with varied perspectives and means of application. It can be scientifically or practically applied through several approaches. As previously described, systems approaches have a rich historical tradition (Skyttner 2005), and thus many different perspectives exist regarding how they should be categorized. There is no shortage of approaches within the systems field, and we sought a perspective that can be applied to business models and business model innovation. The following overview is a synopsis of the reviewed literature.

Table 4 Synopsis of related systems thinking approaches

Category	Approach	Author (Year)	Focus on
Function-oriented systems thinking	General systems theory	Bertalanffy 1956	Function, structure, hierarchy
	Technological systems theory	Ropohl 1979	Function, structure, hierarchy
Cybernetic-oriented systems thinking	Cybernetic theory (first order)	Ashby 1956; Wiener 1954	Steering, communication, control
	Management cybernetic (second order)	Beer 1972	Steering, dynamic, feedback, complexity
	Systems dynamics (SD)	Forrester 1961, 1971	Process, dynamics, feedback, environment
	Soft systems methodology (SSM)	Checkland 1981, 1990, 1997	Organizational process modeling, soft problems
	Critical systems heuristics (CSH)	Ulrich, W. 1983	Practical philosophy, boundaries
	System-oriented management science	Ulrich, H. 1988	Steering, strategies, management
Integrated systems thinking	Systems theory in innovation management	Pfeiffer 1971, 1977	Function, structure, process, governance

Many scholars have argued that ST requires simultaneous understanding of the function, structure, and process of a system (Gharajedaghi 2007; Laszlo *et al.* 2009). Only Pfeiffer's

approach integrates the dimensions of function, structure, and process with the cybernetic approach of steering (governance), which is necessary to keep systems controlled and regulated. Pfeiffer's approach is appropriate for both hard and soft ST (Jackson 1991). We chose this approach for deeper analysis because it demonstrates rich interplay between situations, management communities, and methodology. This interplay generates a convincing and real sense of robustness, which is a requirement for every systems approach (Homer 1996). A second reason for selecting this approach relates to the different ways Pfeiffer understands interrelationships. His approach addresses these interrelationships with different perspectives (e.g., focusing on technology and innovation) while taking a holistic view. Furthermore, the approach is well structured and based on the long tradition of ST within the German scientific community (e.g., Gutenberg 1951; Pfeiffer 1971; Ropohl 1979) and cited in many high-quality publications (e.g., Augsdorfer 2005; Brunswicker & Hutschek, 2010; Jung 2004).

We complement Pfeiffer's approach by asking the following questions:

- What is a system's function?
- What is a system's structure?
- What is a system's process?
- What is a system's governance?

These questions help describe and explain a system before, during, and after implementing any change, whether it applies to the whole system or a single part of it. Following Pfeiffer's ST approach, we thus recognize every object or firm as a system with a concrete function or purpose. Function is reflected in an object's structure, which consists of five factors (Pfeiffer 1971): input, human resources, organization, technologies, and output. The system is subject to a process that is steered (or governed) through control and regulation.

ST requires a holistic, interdisciplinary, and integrated approach. A holistic system approach systematically captures the components of function, structure, process, and governance. An interdisciplinary approach considers different scientific disciplines or communities, such as economics and technology (or innovation management and technology management) and simultaneously operates along numerous tracks of thinking (e.g., dynamic, operational,

quantitative, and scientific) when studying a firm or an object (Maani & Maharaj 2004). Because no business phenomenon or element exists in an isolated system, integration involves identifying interdependencies within a firm and its environment. While a business phenomenon should be viewed through an overall perspective with a holistic focus (Ulrich & Probs 1991), the root-cause effects differ in space and time. During the decision-making process, all influencing factors and interdependencies should be considered in an interdisciplinary manner to reveal hidden connections and avoid time-consuming analysis.

4. Systemic view of business model innovation

4.1. Business model definition

After examining ST and choosing a system approach, we analyzed the business model literature from a systemic point of view, which entails beginning with a practical (real) definition and then using a semiotic lens to discover the nominal definition (to better understand the meaning of the term). These procedures are important because the term business model is a loaded phrase with no agreed upon meaning within the field. In this section, we provide a brief overview of current business model innovation types and processes outside the existing literature.

Zott *et al.* (2011) found there is no common understanding of how the business model is defined in both academia and practice. This makes integrated research in the field almost impossible (George & Bock 2011). Considering this lack of a confirmed definition, studies should not simply ask the question, "What is a business model?", but rather, "What do business models do?" (Doganova & Eyquem-Renault 2009) and further, "How can a business model be innovated?"(Schneider & Spieth 2013). Given the fact that the *business model* has been defined as a *system* (Teece 2010; Zott & Amit 2010) and the term *system* is used several times in the business model literature (Casadesus-Masanell & Ricart 2010; Demil & Lecocq 2010; Morris *et al.* 2005; Zott *et al.* 2011), we accept its definition as "the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities" (Amit & Zott 2001, p. 511). A company can have several business models and several systems (Hedman & Kalling 2003). This practical definition and

understanding of the *business model* is close to that of *systems thinking*.

4.2. A semiotic view on the terms model and innovation

Before further outlining analysis of the business model innovation literature, we must look at the term *business model innovation* from a semiotic perspective in order to understand the nominal definition of the term. Semiotics analyzes the meanings of words and how they are created and is closely linked to ST as both approaches begin with understanding objects of the world as they are described through words (Seiffert 1996). Semiotics can be considered a prerequisite of every ST approach because a clear understanding of the terms involved is required before one can analyze and understand a system. We focus only on the terms *model* and *innovation* because *business* is already broadly understood in the literature.

While *business model* remains a term with growing usage, little has been said about the term *model* in the same context. Accordingly, we examine model theory and its implications for research (e.g., Baden-Fuller & Morgan 2010). A model is always an abstract representation of reality with the aim of contributing to greater understanding and answering questions (Ropohl 1979; Schwaninger 2004). Furthermore, models simplify complex interrelations between objects and, through abstraction, reduce complexity (Ropohl 2012; Stachowiak 1973). Models have a long history in the fields of biology and economics, where they are used to help solve problems as well as increase knowledge (Baden-Fuller & Morgan 2010; Ropohl 2012). In the literature, models are classified as formal and mental models (Gharajedaghi 2007; Schwaninger 2004). Mental models, also called shared mental models (or framework), are subjectively constructed to simplify reality (Gharajedaghi 2007). Formal models help structure reality in a clear and logical way, have a higher degree of precision than mental models, and are mainly used in the natural sciences (Schwaninger 2004). Both types are intended to simplify complex interrelationships and make them more accessible and understandable (Ropohl 2012; Stachowiak 1973). From the perspective of time, models can be divided into static and dynamic models (Baetge 1974; Skyttner 2005). Static models eliminate the variable of time and present a snapshot of a specific point of time in a short- or long-term view. Dynamic models consider time interdependencies and thus the effects of time, meaning one element has to focus on another time horizon. The more dynamic a

model, the closer it approaches reality (Baetge 1974). Any model (mental or formal; static or dynamic) can function in one or more of the following capacities: a description model, an explanation model, a design model, a decision model, a change model, or a simulation model (Schwaninger 2004). The clarification of function is essential for modeling per se (Baetge 1974).

Our contributions from reviewing the theory on business modeling and future research are the following: (1) The business model can be assigned to a mental model or framework (Petrovic *et al.* 2001) due to its abstract description of complex businesses in an attempt to simplify analysis, understanding, and development. (2) A business model is primarily static rather than dynamic (Demil & Lecocq 2010) because the majority of its elements are focused within the same timeframe. In the future, business models will generally become more dynamic. (3) Business models can have different functions; they are currently used primarily for description and explanation (Amit & Zott 2001; Magretta 2002; McGrath 2010; Zott *et al.* 2011) as well as design and decision (Chesbrough & Rosenbloom 2002; George & Bock 2011; Teece 2010). In the future, however, their usage as change or simulation models could increase. (4) Finally, without a business model, the complex business environment cannot be structured clearly enough for management to make decisions regarding future development (Baden-Fuller & Morgan 2010; Magretta 2002).

There are two major challenges to modeling reality through business models: (1) individual interpretation of reality is strongly subjective, and (2) the situation that exists during the modeling process plays a major role in determining which aspects are considered.

Schumpeter (1939) first defined the term *innovation*, which is today considered a key factor regarding competitive advantage and technical progress for firms (e.g., Knyphausen-Aufsess, 1995; Pfeiffer 1971) and nations (Abernathy & Clark 1985). According to Pfeiffer (1971), *innovation* is the convergence of potential (push) and demand (pull). When technological potential meets demand, innovation originates (potential-induced innovation). When there is a demand from the market and a specific technological solution (potential) is invented to meet this demand, this is called demand-induced innovation (Pfeiffer 1971). Innovation can be seen subjectively (new to a firm or market) or objectively (new to the world) (Pfeiffer 1971).

4.3.Processes, directions, and types of business model innovations

Business model innovation, also described as strategic innovation (Markides 2006), is the process by which new value is created and captured through the change of one or more elements of a given business model (Amit & Zott 2001; Bucherer 2010; Demil & Lecocq 2010; Teece 2010). In the literature, process views and directions are quite different. Some scholars characterize the business model innovation process as a process of experimentation and learning (McGrath 2010; Sosna *et al.* 2010); as an evolutionary process (Hedman & Kalling 2003); or as a continuous reaction to incremental and radical changes (Demil & Lecocq 2010). The direction from which business model innovation originates and where it eventually directs a business are more or less missing but must be clear for successful innovation of the business model (Achtenhagen *et al.* 2013; Giesen *et al.* 2007). The earlier description of innovation could possibly increase clarity regarding the directions of business model innovation. Potential-induced and demand-induced innovation lead in opposite directions. In one case, after a new innovative business model is created, there is an attempt to identify market demand for the invention. From this potential-driven perspective, it is unclear whether the business model will be useful as a market solution. Conversely, when following a demand-driven perspective, the market requires new value and thus a new business model. In this case, it is unclear which business model will respond best to the demands of the market (see also Chesbrough & Rosenbloom, 2002). Expanding interest in business models and business model innovation in particular has led to an increasingly wide and diverse body of literature rife with new issues and open questions.

In recent years, a few new business model innovation processes and concepts have emerged. Most of these processes are qualitative explored and are predominantly derived from other innovation or general process models (e.g., Bucherer *et al.* 2012; Sosna *et al.* 2010). Nevertheless, practical understanding of these processes is still limited. A gap remains, hindering effective transfer from concept to reality. One of the biggest questions that is yet to be answered is, "How can firms emphasize the identification, development, and support of new ideas for business model innovation?" (Schneider & Spieth 2013). Inventing business models requires understanding the particular situation of the existing business model,

especially the structural elements, including internal and external interdependencies between the business model and the environment (Baden-Fuller & Morgan 2010; Berglund & Sandström 2013; Demil & Lecocq 2010; George & Bock 2011) as well as among the business model, the environment, and strategy (Klang & Hacklin 2013). Within BMI, it is necessary to manage the trade-off between business model consistency and reality in terms of time and space (Demil & Lecocq 2010). Few business model concepts have been testes in real-world settings thus far, resulting in a lack of conceptual work and questions about how to better understand such phenomena.

Parallel to the BMI process and direction, research currently lacks sufficient understanding about business model innovation types. There are several different approaches (e.g., (Chesbrough 2006; Giesen *et al.* 2007; Morris *et al.* 2013) that focus more on typologies or taxonomies than on results (Baden-Fuller & Morgan 2010); hence, there is no common view about when business model innovation is reached. Figure 13 shows how business model innovation can be distinguished into two different types (Pfeiffer 1980; Zollenkop 2006). The first type is principle business model innovation, where the business model's structural elements (new potential) and targeted markets (new demands) change radically. The second type is gradual business model innovation, where marginal to radical (fundamental) changes occur in either potential or demand (see also Bourreau *et al.* 2012; Markides 2006). However, a business model can be innovative only from a subjective perspective, meaning that each company must design its own business model according to its specific circumstances. Appropriate business model management (Demil & Lecocq 2010) can help maintain a balance between principle and gradual innovation.

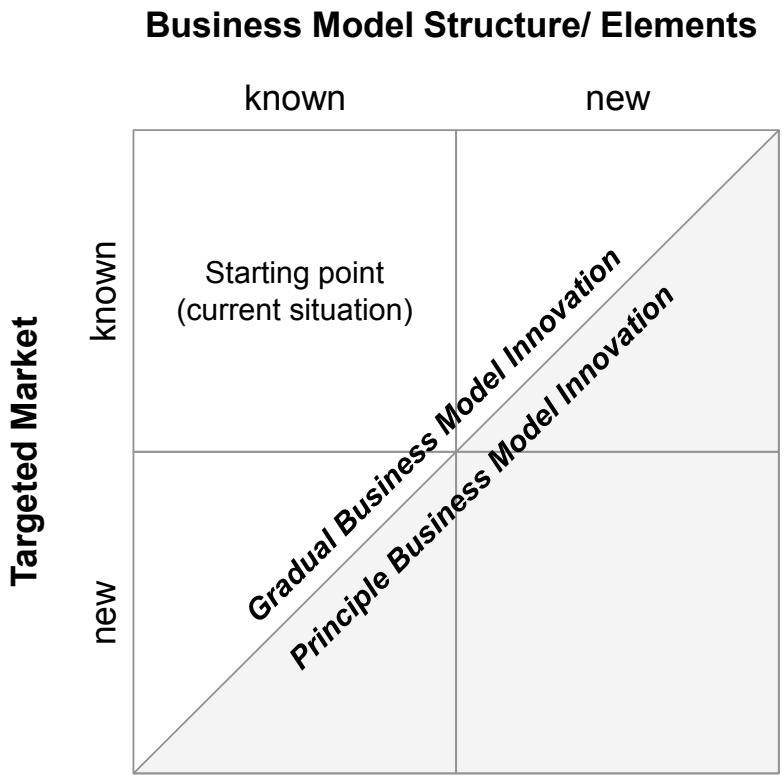

Figure 13: Business model innovation types from a results perspective

This differentiation of business model innovation as processes and types is necessary and can been seen as a major step concerning the lack of a commonly accepted definition in the literature (Schneider & Spieth 2013). Nevertheless, it seems to be clearly accepted that business model innovation as a new form of innovation (e.g., Casadesus-Masanell & Zhu 2013; Markides 2008) plays a major role in sustaining company success (e.g., Chesbrough 2006; Sosna *et al.* 2010; Zott *et al.* 2011) and is a vehicle for transformation and renewal (Demil & Lecocq 2010; Johnson *et al.* 2008).

5. Systems thinking in business model innovation

5.1. Arguments for applying systems thinking in business model innovation

"The best business model innovation opportunities require systems thinking and systems solutions" (Kaplan 2012, p. 82). There are several more arguments similar to this quote regarding the application of ST in business model innovation.

First, some problems are local and, accordingly, are easy to solve in space and time (e.g., a broken chair) (Richmond 1987). Business models are neither local nor static (Bourreau *et al.* 2012; Bucherer *et al.* 2012; Chesbrough 2010) so their evolution and innovation require a dynamic approach (Demil & Lecocq 2010; Morris *et al.* 2005). Business model innovation is extremely complex because it can lead to major holistic change within established businesses (Bucherer *et al.* 2012; Casadesus-Masanell & Ricart 2010). The impacts of business model innovation are by no means local as the effects of change or intervention are physically and temporally separate. Working with business models includes problem solving at a complex level that demands ST (Richmond 1987). Given that little critical discussion has accompanied complexity within business models thus far, it is now an appropriate time to apply ST as a new approach to this challenging task while simultaneously facilitating management (Amit & Zott 2001; Chesbrough 2006; Johnson *et al.* 2008).

Second, as described earlier, the necessity of an integrated ST approach demonstrates the importance of interdependencies in ST. Systems, and thus their interdependencies, are constantly changing due to external environmental and permanent internal changes (driven by learning processes) (Baetge 1974). The same changes occur with respect to business models because their elements and interdependencies are influenced by an organization's external environment (e.g., Baden-Fuller & Morgan 2010; George & Bock 2011) as well as the related ecosystem (Borgh *et al.* 2012). Within business models and in connection to the environment, many interdependencies exist (Demil & Lecocq 2010) that must be considered holistically when working with or implementing change in a businesses (Berglund & Sandström 2013). The business model literature currently lacks clarity on the concepts surrounding this issue. However, interdependencies demand ST (Richmond 1987) and can thus be helpful for business model innovation.

Third, systems are conceptual models and do not exist in reality; they are produced as the result of thinking (Ropohl 2012; Stachowiak 1973). As explained earlier, a model describes or explains a social phenomenon or is employed as a decision-making tool (Flood 2010) and supports management on a strategic level (Forrester 1994). Models are required for ST (Richmond 1987), especially in open and social systems (Bertalanffy 1956) such as firms and organizations. Model development from the ST perspective is an iterative process that

involves a certain amount of trial and error as well as significant time and effort (Homer 1996) and is thus similar to BMI processes (Baden-Fuller & Morgan 2010). Furthermore, business modeling under dynamic conditions is similar to modeling systems for simulation or experimentation (Bossel 2004). From this point of view, business models are a modern form of systems modeling.

5.2. Application of systems thinking to business model innovation

We use a simple, illustrative case to demonstrate the application of ST to the business model in order to provide a clear explanation and aid understanding (Hartmann 1999; Pfeiffer 1997). Before applying ST to business model innovation, we present a framework that included the four systems components from Pfeiffer's approach to holistically analyze the firm's current business model and provide a clear agenda for its innovation. As previously shown, this system-oriented framework can be used to fill the several remaining gaps and answer pending questions in the area of business model innovation (e.g., Schneider & Spieth 2013). In the following, we apply a ST perspective to business model innovation using this framework. When applying ST to business model innovation, we asked questions regarding activities concerning the function, structure, process, and governance of the business model.

The chosen firm for the case study operates in the metal industry and has one major business concept—to develop, produce, and sell conventional-looking systems and products, mainly keys. Mechanical locking products are omnipresent in several application systems (e.g., room doors, car doors, and lock boxes). One locking system generally has many keys, one or more locks, and a locking mechanism. Mechanical locking systems have been used for centuries to protect property from external access. From a systemic point of view, the main business structure of the firm can be described in a simplified way through five factors (Pfeiffer 1971):

- Resources/technologies: turning machines (CNC) and milling machines for the manufacture of metal keys; simple ERP program to support resource planning
- People: knowledge of metal processing, CNC machines, and ERP software; partial knowledge of material composition
- Organization: based on classic manufacturing layout
- Input: metal suppliers and other raw materials providers
- Output: focus on the market for conventional metal keys

Within this market, many changes have occurred in terms of new technologies (microelectronic) and new competitors (emerging markets), resulting in the replacement of mechanical keys with new alternatives. It is obvious that future technologies threaten older technologies. Accordingly, the following questions arise: Will everyday mechanical key in conventional locking systems remain valid in the coming years? Are there existing technological alternatives with the same problem-solving potential? What does this mean for the current business model and the offered value? How can the firm identify a new, innovative business model?

To answer these questions, we employ a system-oriented framework to provide structure and guidance and to frame and focus understanding (Figure 14)

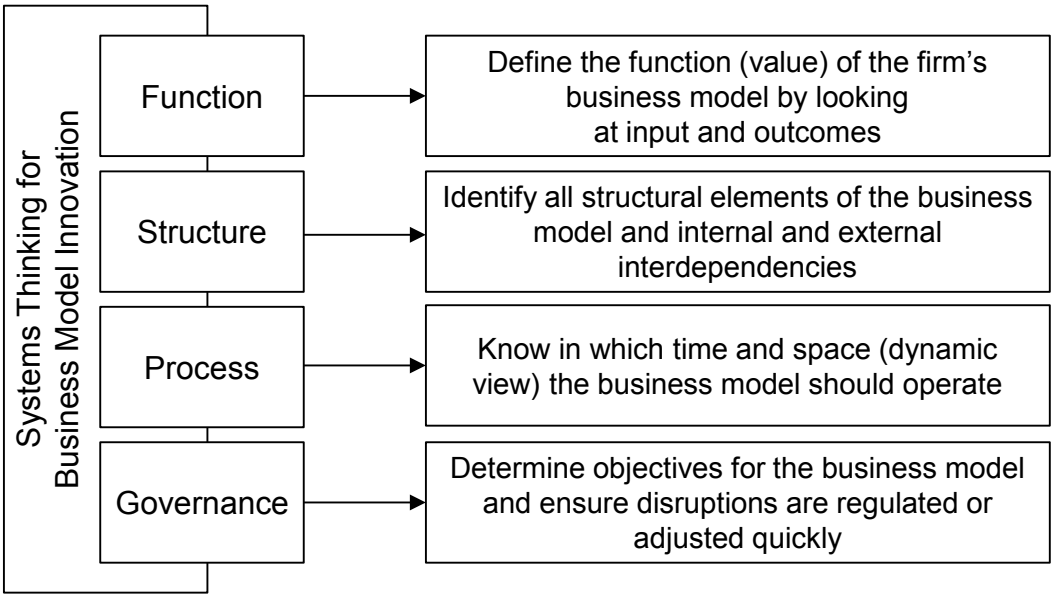

Figure 14: System-Oriented Framework to Guide Business Model Innovation

5.2.1. Function

Taking a functional view of the business model can lead to innovative insights when examining the input and outcomes or results produced (Gharajedaghi 2007).

Defining the firm's product or value proposition from a phenomenological, descriptive view, which considers keys as simply door openers, may hinder innovation of its current business model. The major question is whether the business model takes into account the real function or value proposition (Gassmann & Zeschky 2008), which, in this case, is the function of a key. This reflects the value proposition of a company's business model and should be the starting point for the business model innovation process (e.g., Doganova & Eyquem-Renault 2009; Johnson *et al.* 2008; Magretta 2002). From the ST perspective, and separate from context, a key functions as information memory (i.e., the milled structure of a key stores specific information or access to something). Through this functional, abstract view, considering a key as information memory provides new perspectives for innovation. This view shares similarities with the concept of a cross-industry searching strategy (Brunswicker & Hutschek 2010). For example, a chip card or fingerprint can also be described as information memory and thus the firm could innovate in this direction (chip-card production or fingerprint-recognition systems). The firm could create a new business model to develop, produce, and sell chip cards, which are also technical objects that store information. In this way, a completely new field of business application can be reached. In short, from a functional abstract view, determining the innovation direction of a business model is crucial and reduces dependency on simply imitating other business models (Enkel & Mezger 2013). From our perspective, principle innovation can be derived mainly from rethinking function via a functional abstract view, followed by various artefact interactions (Eppler *et al.* 2011). Therefore, the functional abstract view presents a technique for enlarging the space for innovation and identifying new business model opportunities.

5.2.2. Structure

If a firm concentrates on the information memory market, the entire business structure, including its interdependencies, must change and, along with it, the business model. The overall operational management and the value is created within the business model (Demil

& Lecocq 2010; Morris *et al.* 2013; Teece 2010) must also change. Furthermore, employee knowledge would have to be extended to plastic materials (chip cards) or the handling of biometric data rather than metal keys. The firm's machinery as well as its organization would need to move to be appropriate for plastic or biometric technology. In the end, new suppliers would be needed to obtain the appropriate resources when needed. Every structural element of the business model would change after defining the new function. When structural elements change, all the elements and their functions must be revised due to their interrelatedness.

5.2.3. Process

Following the static view of the function and structure of a firm's business model, the next two steps—process and governance—represent mainly the dynamic view. Business model research focuses to some extent on dynamic aspects (Bourreau *et al.* 2012; Bucherer *et al.* 2012; Chesbrough 2010), which are required by Demil and Lecocq (2010) and Morris *et al.* (2005). *Process* describes the realization of the structure in time and space. From the spatial perspective, the key manufacturer must decide how its facilities should be used and design the material flow with regard to site layout and configuration of existing resources (Chesbrough 2010). From the temporal perspective, the firm must determine the iteration of process activities and time-to-market aspects (Baden-Fuller & Morgan 2010; Markides & Sosa 2013). Additional questions often arise, including the following: When should a firm begin working with a new technology and thus with the new business model? When should a firm re-train employees to establish new knowledge? To address these questions and establish a temporal order for decisions, business model roadmapping can be implemented (Reuver *et al.* 2013). Time and space perspectives can thus help to operationalize concept (function and structure) into reality.

5.2.4. Governance

According to ST, governance (i.e., steering) can be divided into control and regulation (Ulrich & Probst 1991). Governance is necessary to control and regulate a system or business model and is known in the business model literature as the guiding principles or rules (Morris *et al.* 2005; Zott & Amit 2010). In the case firm, control means that the key

manufacturer must set new objectives for control on different levels based on functional, structural, and process changes. The need for regulation results from internal or external disturbances (i.e., new fingerprint technology); these disturbances can also be seen as disruptive innovations (Christensen 1997; Markides 2006). The biggest challenge is to identify disruptive innovations or relevant disturbances quickly, ideally before they occur. If disruptions have already occurred, regulations must allow for them while ensuring adjustment as quickly as possible.

In summary, when applying ST to business model innovation, one must consider and analyze a firm's current business model using the dimensions of function, structure, process, and governance. To innovate the business model on a principle level, the agenda must begin with rethinking the function of the business model and then identifying changes in the other three dimensions. With this in mind, it is possible to use business model innovation in a holistic, interdisciplinary, and integrated manner, in other words, ST.

6. Contributions

In this paper, we propose a system-oriented framework to cross-fertilize the fields of systems thinking, business model, and business model innovation. We discover that business model research could improve discussion and understanding if aspects of model theory were considered more often in the research and practice of business models. We derive new insights from a system-oriented view of business model innovation process, direction, and type. Direction can be categorized as either potential-driven or demand-driven, which provides a helpful way to explore existing questions in the business model literature. The two major types of business model innovations explained in subsection 4.3 can encourage further discussion about the degree of business model innovation. With our investigation, we add a new systemic perspective of the business model to the existing views of e.g., Doganova and Eyquem-Renault (2009).

We are hopeful that this perspective will become a part of the theory around the fundamental debate within business model research. As we clearly argue, the application of systems thinking to business model innovation makes sense from a theoretical perspective.

From our perspective, using systems thinking in business model innovation is a fruitful combination in practice because working with business models and creating business model innovation are among the most complex and challenging management tasks. They require an approach that takes into account complexity, interdependencies, and modeling assistance. The proposed framework enables better management of the complex present and volatile future of a firm's business model and provides a clear agenda with a new perspective on innovating business models.

The benefits of our study are manifold for both academia and practice and clearly demonstrate the value of using ST in business models and BMI:

- ST offers a common formal starting point for different views on complex business models.
- ST considers the entire business model with all its components and elements from a holistic view (i.e., function, structure, process, governance).
- ST enables an interdisciplinary view on business model innovation that different from that of other scientific communities (e.g., innovation management and technology).
- ST facilitates an integrated view for the identification of interdependencies of complex root-cause effects within a business model and in external environments.
- ST reveals previously uncovered connections and avoids isolated business model analysis.
- ST facilitates the search for new business model ideas through the functional, abstract view and assessment of business ideas and by answering the question, "How can firms emphasize the identification, development, and support of new ideas for business model innovation?"

Several future directions for academia can be identified. First, business model research can benefit from systems thinking. Future research on this topic can create a clearer link between these two fields and build a theoretical foundation for business model research as well as enable collection of additional empirical data. Second, research on business model

innovation is currently primarily focused on processes and needs to expand to overall concepts, including exploration, evaluation, and action-taking, in order to improve the emerging business models field. Third, ST skills can be developed further in terms of management practice and transferred to work with business models. Here, empirical research can be conducted to demonstrate the effectiveness of applying systems thinking in management. Fourth, computer-based simulation games can help teach systems thinking. Business model simulations based on ST are an excellent means for management working with business models to simulate what various changes or innovations to a particular model or models in general may mean.

7. References

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CURRENT RESEARCH PRACTICE ON BUSINESS MODELS AND BUSINESS MODEL INNOVATION: A REVIEW OF AN EMERGING RESEARCH FIELD

1. Introduction

Research on business models (BMs) and business model innovation (BMI) has become increasingly relevant in recent years (Lambert & Davidson 2013; Schneider & Spieth 2013). There have been significant attempts to extend the literature in order to increase understanding of the BM concept and BMI phenomenon on conceptual and empirical bases. Diverse research conducted over the last decade regarding the BM concept has led to a multitude of definitions and approaches (Zott *et al.* 2011) but a lack of theoretical anchoring (Teece 2010). The number of empirical studies examining BMI as a result or a process has increased significantly in recent years (Schneider & Spieth 2013). This indicates the increasing importance of empirical research for studying and understanding the BM concept and BMI processes (Spieth *et al.* 2014). Despite the relevance of research in these fields, the most appropriate methodology (i.e., the research procedures employed) or research design (i.e., the research setup) for conducting BM and BMI research has not been determined. Thereby, an overview of studies and applied methods will help assess current research activities in this field regarding standards in research and provide possibilities for better research. Furthermore, a discussion of current research trends and a comparison of these with the expectations of top academic journals (e.g., *Academy of Management Journal*) will help to increase the rigor and relevance of BM and BMI research. Existing reviews of methodology and research design in fields such as marketing (Beverland & Lindgreen 2010; Piekkari *et al.* 2010), supply chain management (Soni & Kodali 2012), international business (Yang *et al.* 2006), competitive strategy (Hutzschenreuter & Israel 2009), and organizational identity (Ravasi & Canato 2013) have demonstrated that such a review is helpful and even necessary to understand the research processes occurring in the field and identify challenges and promising trends.

Hence, the purpose of this article is to examine the state of BM and BMI research over a 14-

year period from 2001 to 2014 from the standpoint of existing methodology, research design, and methods. Furthermore, the paper aims to provide a comprehensive, structured overview of the BM and BMI literature and provide implications for future research applications. The following questions are of particular relevance for the present study:

- Which research methodology, research designs, and methods have been applied in empirical studies on the BM and BMI?
- Is there a divergence between empirical research and the requirements and recommendations made in top academic journals?

In this article, we use the six-layer empirical research framework presented by Saunders *et al.* (2009), commonly known as the "research onion", to aid our review and classification process and uncover research practice in particular areas. We believe there is no single prevailing set of best practices for BM researchers; rather, there are conflicting standards as to what constitutes "good" research. Therefore, we discuss our findings in view of general requirements and recommendations for (innovation) management research and reveal a need for enhanced thinking about research and better research in BM and BMI. Besides empirical studies, many conceptual studies have explained or framed the construct of the BM in detail. The insights these provide are relevant for management and innovation scholars and helpful for assessing research activities and supporting proper application of methodology and research designs for future research projects.

Our review contributes to the literature on BM and BMI in three areas. First, we uncover the status of methodology, research design, and methods through an extensive review. Second, we provide an overview of the results and outline the major methodologies and research designs used in this field. Third, we show there is no straightforward relationship between the academic community's methodological requirements and the actual use of methodology. Furthermore, the review can encourage debate within the academic community about academic excellence regarding the relationship between rigor, relevance, and revealing "ah-ha" moments (van Maanen *et al.* 2007, p. 1148).

The remainder of the article is structured as follows. Chapter 2 describes the current status of the rapidly growing field of BM and BMI research. Chapter 3 describes the selection of

relevant journals, articles, reviews, and analyses. Chapter 4 present the results of the review. Chapter 5 discusses the results and compares them with the requirements and recommendations of top academic journals and makes implication for appropriate research in the future. Finally, Chapter 6 provides a conclusion.

2. Current status of business model and business model innovation research

"A critical challenge to business model research is its lack of coherence." (George & Bock 2011, p. 89). Although there is no widely agreed-upon understanding and a general lack of coherence regarding the BM concept (George & Bock 2011; Zott *et al.* 2011), managers and scholars alike have found it a useful concept for analyzing (e.g., Baden-Fuller & Morgan 2010) and developing business (e.g., Teece 2010) as well as for storytelling and communication (e.g., George & Bock 2011). After more than a decade of intensive research on the BM concept, there is still no consensus regarding its meaning (Zott *et al.* 2011); however, it has become clearer what it is and what it is not (DaSilva & Trkman 2013). The ability to successfully manage and innovate BMs is currently one of the most challenging tasks for management (Chesbrough 2010). BM as a concept (Zott & Amit 2008) can be used as the unit of analysis or framework for empirical studies and implies knowledge of the relationships among the elements of the BM (Lambert & Davidson 2013). Moreover, studying the subject is important for strategic management research because the BM influences firms' possibility for value creation and value capture (Amit & Zott 2001). Nevertheless, research has outlined many different definitions, functionalities, applications, and areas of interest as well as dimensions of and approaches to the concept (e.g., Morris *et al.* 2005; Zott *et al.* 2011).

At the same time, BMI, which is distinguishable from results or process perspectives, has received increasing attention in both practice and research (Schneider & Spieth 2013). There has been a noticeable change from a static view of the BM to a more dynamic (transformational) view that includes BMI (Demil & Lecocq 2010). Despite this trend, there is still a need to learn more about how the process of exploring, selecting, and implementing new BMs should be arranged (Achtenhagen *et al.* 2013) to enable emerging businesses to

exploit opportunities in volatile environments (Spieth *et al.* 2014). However, inconsistencies in the conceptual framework of the BM and a lack of solid theoretical anchoring (Teece 2010) make the study of both the BM and BMI challenging (Casadesus-Masanell & Zhu 2013). Additionally, scholars have argued that there is a lack of systematic, large-scale studies that are necessary to gain better understanding of the BM concept (Bock *et al.* 2012) and the core elements and process steps of BMI (Schneider & Spieth 2013).

In short, there is a need for additional research focusing on the construct of the BM and how firms can use BMI to capture more value and ensure survival in a competitive environment. This gives rise to the question of which methodology and research design are the most suitable to address these questions while at the same time fulfilling modern research requirements (e.g., Easterby-Smith *et al.* 2002; van de Ven 2007). Two reviews that have been conducted on the topic provide some understanding of the methodologies used in the BM and BMI literature. Lambert and Davidson (2013) reviewed articles that examine the BM concept through empirical research (published between 1996 and 2010) and categorized these from a results perspective around three main themes (Lambert & Davidson 2013): (1) the BM as a basis for firm classification, (2) BM choice as a factor of firm performance and success, and (3) BMI as a key to successful change in a firm. The study highlights the increasing trend and value of using the BM as a research construct to systematically gather information about phenomena that are interesting to a firm. Moreover, it exhibits that the BM concept is frequently used in research to provide a perspective on an industry or group of companies and retrospectively establish specific BM types that are often related to company success (Lambert & Davidson 2013). Therefore, in most empirical studies, BMs are described as specific to an industry, company, or region and focus on the present instead of the future (Lambert & Davidson 2013). This specialization leads to problems regarding the generalization of findings or the replication of studies in other industries or companies.

Schneider and Spieth (2013) also conducted a broad analysis of the literature on BMI and discovered three main research streams: (1) prerequisites for conducting BMI, (2) elements and processes of BMI, and (3) effects achieved from BMI. In their article, they superficially identified the methodology used in the examined literature and proposed a theoretical framework for further research in the BMI field (Schneider & Spieth 2013). However, the

focus of the study is on the contributions of the analyzed articles instead of their applied methodology.

In summary, methodology and research design were not the focal point of either review. Ultimately, there is an obvious breadth to the research that scholars have conducted to directly investigate BMs and BMI as well as works in other management fields where the BM is used as a construct to study other phenomena. However, favored methodologies, a "standard" research design, and the deductions that can be made from study findings are still unclear.

3. Design of the review and background

3.1. Design of the review

We located major BM and BMI articles and analyzed the methodologies, research designs, and methods used. For the purposes of analysis, we excluded review articles as these present no new primary findings and based our work on the review method in which primary studies and papers concerning a certain research question are examined (Cooper & Hedges 1994). To execute a "good" review (Boote & Beile 2005), we also considered aspects from similar studies in other fields (e.g., Hutzschenreuter & Israel 2009; Yang *et al.* 2006) and correlated our study in present article with the on-going dialogue in the literature.

In our review, we applied a procedural method with six distinguishable steps (Cooper & Hedges 1994):

- Verbalization of the research problem
- Literature retrieval
- Literature review
- Classification of the articles in literature review as conceptual or empirical
- Analysis and interpretation of empirical papers
- Presentation of results

We systematically retrieved the literature, thus guaranteeing the reproducibility of results.

To limit search complexity and ensure the retrieval of a wide spectrum of research articles, we initially used Business Source Premier (EBSCO), a large international database, and followed this with a profound cross-citation procedure. We categorized relevant journal articles according to the following criteria:

- Published in an innovation or general business journal
- Published in an A-, B-, or C-ranked journal (as of September 2014)
- Keyword 'business model' in title and/or abstract
- Published between January 2001 and September 2014
- Business model or business model innovation as the main object of study

The systematic retrieval of literature resulted in 86 articles. For the next step, we classified the articles into three groups based on the type of research: literature review (4), conceptual (20) (see table 5), and empirical (62). Literature review articles collect relevant scientific literature on a specific topic (defined by the author), present the results of a critical review, and summarize the literature to establish an overview of the current state of the topic (Hart 1998). A conceptual paper goes beyond a literature review and makes a unique proposition rather than merely providing a summary of existing research. Nevertheless, a short review of the literature is necessary in conceptual papers to demonstrate the author's knowledge base and enhance understanding of the topic at hand. The outcomes of conceptual papers can be new or advanced theories, frameworks, themes, and models or just general statements about a current situation or development. To some degree, conceptual work allows for more flexibility and less rigor because it can be the first step in analyzing an idea and receiving feedback. Additionally, for readers, a conceptual approach "can shape their future thinking and allow them to see the world in a slightly different light" (Siggelkow 2007, p. 23). Empirical articles (the topic of this review) use a set of data (qualitative or quantitative) collected and analyzed through specific methods with the aim of answering a clearly defined research question. In some cases, the categories of literature review, conceptual study, and empirical study overlap (i.e., they are not mutually exclusive), and journal editors may use their own definitions and distinctions in this respect.

Table 5 Literature reviews and conceptual articles

Type	Author(s) and year	No. of articles
Literature review	Morris *et al.* (2005); Schneider and Spieth (2013); Spieth *et al.* (2014); Zott *et al.* (2011)	4
Conceptual paper	Abdelkafi *et al.* (2013); Baden-Fuller and Morgan (2010); Baden-Fuller and Haefliger (2013); Berglund and Sandström (2013); Casadesus-Masanell and Ricart (2010); Chesbrough (2010); Chesbrough and Rosenbloom (2002); Dahan *et al.* (2010); Da Silva and Trkman (2013); De Reuver *et al.* (2013); Doz and Kosonen (2010); Gambarella and McGahan (2010); Huarng (2013); Itami and Nishino (2010); Mandiberg and Warner (2012); Markides (2006); Markides and Sosa (2013); McGrath (2010); Teece (2010); Zott and Amit (2010)	20

Note: Some articles lack transparency regarding methodology, which makes them difficult to classify. Authors may have varying opinions about the classification of their studies.

We employed a descriptive review procedure for empirical articles to analyze the status quo and trends and develop better understanding of empirical research methodology and research design in BM and BMI articles. To classify the 62 empirical articles, we read them and subsequently discussed them in several group sessions. Afterwards, we noted required information in a comprehensive spreadsheet (see appendix IV).

In the widely ranging articles and books that discuss methods for conducting business research, major terms (e.g., research method, research methodology, and research strategy) are used differently and interchangeably, which means there is no common understanding or major research model that is generally followed for the type of analysis we conducted. To structure our review and provide a systematic overview of the examined articles on BM and BMI, we adapted the research onion concept (Saunders *et al.* 2009). This concept, based on broad scientific knowledge, has a long tradition and is widely used in academia as evidenced by the number of time it has been cited.

The research onion concept is a guide for research and distinguishes between philosophies, approaches (as opposed to methodology), research design, and data collection and analysis methods (Saunders *et al.* 2009). Similar to the ring-shaped structure of an onion, the research onion represents research procedures as moving from general (philosophy) to specific (data collection and analysis). The internal layers refer to approaches, strategies, choices, and time horizons (Saunders *et al.* 2009). These onion layers need to be peeled away before commencing data collection techniques and analysis procedures. To avoid excessive complexity in our review and ensure a specific focus on research applications, we excluded the philosophy dimension while still keeping in mind that this dimension fundamentally guides an investigation in terms of ontology and epistemology. Furthermore, it is difficult to assess the philosophy dimension without involving the research context. We considered methodology by examining the research approaches used in the articles.

To visualize the research onion as applied to our review, we adapted a morphological box (see table 6).

Table 6: Applied research onion concept (Source: based on Saunders et al. 2009)

	Layer/ perspectives					
Methodology	Philosophy	Epistemology	Ontology			
	Approaches	Deductive	Inductive	Abductive		
Research design	Strategies	Experiment	Survey	Case study	Action research	Archival research
	Choices	Mono-method	Mixed methods	Multi-method		
	Time horizon	Cross-sectional	Longi-tudinal			

Methods	Data collection and data analysis	Secondary (history) data	Obser-vation	Interviews	Questio-nnaires	Content analysis	Statis-tical analysis

Table 6 shows that a variety of considerations play a role in the process of conducting (innovation) research. With regards to research questions, it is crucial to distinguish between scientific thinking (methodology), the general process of answering a research question (research design), and data collection and analysis (methods) (e.g., Robson 2002; Bryman & Bell 2011). A research question is generally determined by whether the answers are exploratory (a description of what is occurring, particularly in new situations), descriptive (a description of the accuracy of what is occurring), or explanatory (a description of why particular actions are occurring) (Robson 2002).

3.2. Background of major research terms used in the review

The first area of focus in our review is the chosen *approach* (methodology) of a research article, which describes the relationship between theory and research. Researchers must determine whether to follow a deductive approach in which a theory and hypotheses are developed and tested or an inductive approach in which data collection and analysis are employed to develop or enrich an existing theory (e.g., Cooper & Schindler 2003). Theory verification (deductive approach) must employ an appropriate research strategy and a structured data collection method for testing hypotheses using the gathered data. Theory building (inductive approach) documents current practice and subsequently explores the relationship between practice and system performance (Bryman & Bell 2011). The main purpose of inductive research is to derive input for theory building and hypothesis discovery from observations and findings (Mayring 2003). Both the deductive and inductive approaches can be considered tendencies rather than clear-cut distinctions (Bryman & Bell 2011). In addition to these classical approaches, there are other newer approaches (for an overview, see Polsa 2013). One of the most of these is the abductive approach, also called "systematic combining", which describes the continuous and iterative movement "back and

forth" between the empirical and theoretical worlds (Dubois & Gadde 2002, 2013). In our review, we searched for named methodology approaches or indicators of one of these approaches (e.g., the keyword "hypothesis" for deductive or "explorative" for inductive). Indications were usually found in the abstract, introduction, or conclusion sections of articles in proximity to descriptions of the research aims.

The second focus was on the chosen *research strategy*, which can be exploratory, descriptive, or explanatory (Robson 2002; Yin 2009). No research strategy is inherently superior or inferior to any other (Saunders *et al.* 2009), and the most important consideration is that the research strategy enables a researcher to answer research question(s) and achieve study objectives. Several research strategies are outlined in the literature (see the general overview in Easterby-Smith *et al.* 2002), but we focus on those that are relevant for innovation research (i.e., BM and BMI research). The following briefly describes these strategies.

Normally, *experiments* are used to test hypotheses and are undertaken in a laboratory setting apart from general society (for experiments in innovation, see e.g., Sørensen *et al.* 2010). *Surveys* employ a cross-sectional design in which a specific amount of data in standardized form from a relatively large number of individuals, mainly by questionnaires or structured interviews (e.g., Robson 2002; Bryman & Bell 2011). *Case studies* aim to understand complex social phenomena and are typically based on a variety of data sources (Yin 2009). These often focus on a single organization, location, person, or event (Bryman & Bell 2011) to develop theories that are accurate, interesting, and verifiable in later deductive research (Eisenhardt 1989; Eisenhardt & Graebner 2007). With the help of *action research*, complex social processes are examined while introducing changes to the studied process and observing their effects (e.g., Checkland & Holwell 1998). This type of research allows simultaneous observation and participation in the scenario under study (Baskerville 1997). *Archival research* focuses on the past and changes that occur over time and uses administrative records and documents, which may have been initially collected for different purposes, as the primary data source (Saunders *et al.* 2009). In our review, indications of research strategy were often found in the methods or research design sections of articles. Most papers also described their research strategy briefly in the abstract and introduction, with additional information sometimes provided in titles and keywords.

Research *choices* refer to the way in which quantitative and qualitative methods and procedures are combined (Bryman & Bell 2011). Mono-method research combines a single data collection method with a single corresponding data-analysis procedure. In contrast, multi-method research employs more than one data collection method with corresponding analysis procedures. However, this type of research is restricted to either a quantitative or a qualitative data set. Mixed-method research employs both quantitative and qualitative data collection methods and analysis procedures simultaneously or sequentially (Saunders *et al.* 2009). Mixed-method research involves triangulation, which is the process of using two or more independent sources of data or data collection methods to validate research findings. The usefulness of the triangulation process is one of the main reasons this type of research is used (Polsa 2013; Yin 2009). In the course of our review, it was sometimes difficult to determine the research choice in the methods or research design sections. Additionally, the authors stated they used triangulation and thus mixed-method research in a few articles, but we determined that the actual research choice was multi-method.

There are two distinct forms of the *time horizon*. First, cross-sectional studies collect data on only one occasion (Saunders *et al.* 2009) so the research represents a snapshot of a specific point in time (Cooper & Schindler 2003). Second, longitudinal studies are repeated at least once over an extended period (Bryman & Bell 2011), which provides a more comprehensive view of a subject. Although the ideal period for a longitudinal study is not specified in the literature, Pettigrew (1990) mentioned that a three-year period enables better understanding of an organization while tracking changes over time. Unless we specifically denote a study as longitudinal or the explanation of the research process clearly suggested otherwise, it can be assumed that the studies discussed are of a cross-sectional nature.

Saunders *et al.* (2009) distinguished between *data-collection methods* (e.g., questionnaire or interviews) and *data-analysis methods* (e.g., content analysis or statistical analysis). Research design aspects (i.e., strategy, choice, and time horizon) are not specifically related to a particular method of collecting and analyzing data. Data can be collected from either a primary source (e.g., questionnaires, interviews, or observations) or a secondary, already existent source (e.g., historical data). Further, data can be classified into quantitative and qualitative data (Easterby-Smith *et al.* 2002). Quantitative data have specific numerical values

and a physical unit allocated to each variable. Qualitative data (i.e., non-numeric data) are statements or themes in text or audio form that offer insights into complex social processes. Generally, these data are not quantifiable (e.g., yes/no answers) (Soni & Kodali 2012). Qualitative data are associated not only with case study research but also with other research strategies (Eisenhardt & Graebner 2007). Triangulation of data requires the use of various qualitative and quantitative data collection methods in a single study (Pettigrew 1990).

Analysis procedures for non-standardized, somewhat complex qualitative data and the underlying content range from simple categorization or summary of responses to deep processes that identify relationships between categories (Saunders *et al.* 2009). Analysis of quantitative data is normally conducted using diagrams and statistics to reduce the amount and complexity of the data, test relationships between variables, and develop ways of interpreting and presenting the results to others (Bryman & Bell 2011). Statistical analysis can be classified as descriptive (representative of an important aspect of a data set by a single number or variable), correlative (representative of the relationship between two variables), and complex (representative of the relationship between multiple variables, which uses methods such as multiple regression and multivariate analysis) (e.g., Robson 2002). However, it is difficult to determine where primary analysis ends and secondary analysis begins (Bryman & Bell 2011).

4. Review results

This section presents the results of the review process with a focus on BM and BMI research approaches, research designs, and methods. Table 7 exhibits the number and distribution percentages of the empirical articles (62 in total) considering Saunders *et al.*'s (2009) framework.

Table 7: Review results

		Layer/ perspectives					
Methodology	Philosophy	Epistemology	Ontology				
	Approaches	Deductive 17 (27%)	Inductive 43 (70%)	Abductive 2 (3%)			
Research design	Strategies	Experiment 3 (5%)	Survey 8 (13%)	Case study 42 (68%)	Action research 0 (0%)	Archival research 9 (14%)	
	Choices	Mono-method 17 (27%)	Mixed methods 9 (15%)	Multi-method 36 (58%)			
	Time horizon	Cross-sectional 44 (71%)	Longi-tudinal 18 (29%)				
Methods	Data collection and data analysis	Secondary (history) data	Obser-vation	Interviews	Questio-nnaires	Content analysis	Statis-tical analysis

Note: Due to the use of different methods (i.e., mono, mixed, or multi) a count of data collection and data-analysis methods is not appropriate.

From 62 reviewed empirical articles, 17 (about 27%) were identified as employing a deductive approach and 43 (about 70%) as following an inductive approach. Most of the papers that followed the deductive approach used hypotheses that were clearly deduced from the literature (theory). We determined that two articles used the abductive approach as they employed multiple cycles of iterations between theory and data (Frankenberger *et al.* 2013; Klang & Hacklin 2013). As an example of this approach, Frankenberger *et al.* (2013) used questionnaires and workshops (notes) for data collection in an investigative case study, followed by isolated and cross-case data analysis. After this, they drafted a framework from the results that they compared with theory. Next, they discussed the findings with other

researchers and included insights from practice. Finally, they presented the framework at a workshop and collected further statements and insights. The abductive approach used in their research demonstrates the use of multiple cycles with concrete interactions (Dubois & Gadde 2013).

Every article reviewed the literature to some extent. Some articles deduced their research framework from the literature in order to structure data collection and data analysis (e.g., Bucherer *et al.* 2012; O'Connor & Rice 2013; Shin 2014).

Experiments. Only three experiments (about 5% of the articles) were conducted specifically in the BM and BMI context. Two were based on a game-theoretical framework and experimented with strategic interactions in a formal model (Casadesus-Masanell & Llanes 2011; Casadesus-Masanell & Zhu 2013). The aim of the third experiment was to compare team processes of managers working on BMI tasks (Eppler *et al.* 2011). The low number of studies that used experiments underpins that this method is rarely utilized and possibly undervalued. Research has determined that experiments can be extremely useful for real-life problem solving while simultaneously creating new and retrievable scientific knowledge (Sørensen *et al.* 2010).

Surveys. Seven studies that employed with using a large sample population (n > 120) were included in the review. One survey was based on 12 expert interviews and was detached from a specific case and can be considered a special form of expert survey (Stampfl *et al.* 2013). The majority of surveys followed the deductive approach. In one case, we found a study that followed the inductive approach and used a questionnaire with open-ended questions to examine understanding of management's BM definition with the aim of providing new directions for theory development and empirical study (George & Bock 2011). The majority of surveys were published after 2010, which demonstrates that the BM and BMI constructs have become more approachable for study via survey (i.e., large-scale studies).

Case studies. As shown in table 7, case studies constitute the majority of applied research strategies (42). This highlights the fact that empirical research in BM and BMI is in a rather early phase and should be more explorative. Nearly 41% of the case studies are single case studies (17), and the remaining are multiple case studies (average of 12 cases). Articles using

single case studies often describe these as in-depth case studies. In one multiple-case-study article (25 total cases), two cases were separated into single case studies for examination in greater depth (Achtenhagen *et al.* 2013). Where research was based on multiple case studies, in most instances, cross-case analysis was used to determine similarities and differences between the investigated cases (e.g., Miles & Huberman 1994). Case study is currently the most common research strategy for theory construction as well as for testing the feasibility of newly designed BMs.

Archival research. Archival research was used in nine studies, a few of which incorporated a large amount of data. All nine articles used secondary data sources, mainly as historical references (i.e., an ex-ante perspective). One article took a more inductive approach and used longitudinal company data for a period of over 15 years with the aim of understanding strategic behavior, BMs, and firm performance, with a special focus on evolutionary changes (Thoma 2008).

Regarding *time horizon*, our review illustrates that most articles were cross-sectional, irrespective of the chosen approach or strategy. This implies that the majority of articles studied a particular phenomenon at a particular point of time, thus creating a "snapshot". All reviewed articles that employed a survey strategy (8) used a cross-sectional approach, which is in line with the methodology literature (Easterby-Smith *et al.* 2002), with the aim of describing the incidence of a phenomenon or explaining how factors relate to the phenomenon in different organizations. In addition, case studies mainly focused on the cross-sectional approach (27), with interviews conducted over a short period. Moreover, research projects undertaken for studies such as doctoral projects are necessarily time-constrained, which leads to the extensive use of a cross-sectional time horizon. As our results show, there were 15 longitudinal case studies that observed people or events over time to examine change and development. Not only can case studies be longitudinal, but archival research also provides an excellent opportunity to re-analyze massive amounts of published data over time or while using several data points (e.g., Thoma 2008; Bohnsack *et al.* 2014).

Data collection and data-analysis methods were not always obvious or described in detail in the reviewed articles. Some articles included overview tables to visualize the data sources used (e.g., Holm *et al.* 2013; Khanagha *et al.* 2014), describe interview participants (including

background information) (e.g., Klang & Hacklin 2013), explain data collection and analysis procedures in detail (e.g., Miller *et al.* 2014), or outline a graphical research framework (e.g., Aspara *et al.* 2013). Sometimes, this information was included in an appendix (e.g., Dunford *et al.* 2010; Sosna *et al.* 2010). Most case studies used interviews (38) as the primary data collection method, with the number of interviews differing significantly (a minimum of 3 and a maximum of 186). In certain cases, a concrete number of conducted interviews was not reported or the information provided was not sufficiently specific (e.g., "more than 30 interviews"). Almost every case study combined data from interviews (i.e., primary data) with secondary data, in some cases in a diversified manner (e.g., press, websites, reports, and presentations). Additional secondary data, archival data, or notes were commonly used for triangulation to enhance data validity (Saunders *et al.* 2009). In one case study, secondary data was supplemented by workshops (e.g., Pynnönen *et al.* 2012). The amount of (primary and secondary) data required to ensure valid results was not clear and there was no "magic number" (Pratt 2009, p. 856). However, data collection generally continued until saturation was reached (Pratt 2009). One of the reviewed articles counted the secondary data used for research in the form of the number of annual reports considered (e.g., Lehoux *et al.* 2014), which is a practice that encourages transparency. In all articles using qualitative data, little was said about data analysis in terms of what analysis technique or software was used. To the best of our knowledge, qualitative data was gathered mainly through interviews, with content analysis used for evaluation and interpretation (e.g., Mayring 2003). We found different coding techniques, including open, axial, analytic, and elective coding. A good presentation of the data-analysis process can be found in Dunford *et al.* (2010) and Günzel and Holm (2013), and a profound description of qualitative data coding procedures can be found in Klang and Hacklin (2013) and Miller *et al.* (2014). Additional detailed interview quotes can be found in the appendix of Wilson and Post (2013). A variety of software applications were used for qualitative data analysis, for example, NVivo (Dunford *et al.* 2010), QSR nVino9 (Günzel & Holm 2013), and QDA Miner (Lehoux *et al.* 2014). Quantitative data collection was based on either questionnaires (6), with an average of 150 completed questionnaires, or secondary data (8). A good overview of the entire data collection and analysis procedure in terms of step-by-step documentation was rarely found, with the exception of Dewald and Bowen (2010). Compared to qualitative data, quantitative data-

analysis techniques were easier to determine. The most common statistical analysis techniques found were regression, correlation, and factor analysis (e.g., Bonaccorsi *et al.* 2006). In many cases, several statistical techniques were used in a single paper to analyze and validate data (e.g., Amit & Zott 2001).

5. Discussion and implications

This paper summarizes common research practices in the BM and BMI fields. The results indicate that: (1) the inductive approach is the most commonly employed methodology and is mainly driven by the need for exploration due to a lack of clarity regarding the BM concept and a lack of knowledge regarding BMI; (2) as expected, case study is the most popular research strategy, followed by archival research; (3) descriptive or explanatory research strategies (i.e., experiments and surveys) are limited, and strategies that consider change characteristics, such as action research, are lacking; (4) the methods used indicate that combinations of methods are not always correctly understood or transparently described; (5) the potential of longitudinal studies is underestimated, and this type of study conflicts with the short-term perspective of many research projects; and (6) transparency in data collection and data analysis is limited and detailed description in, at the least, an appendix could increase plausibility of results.

The findings reveal a need for better research in the BM and BMI fields in terms of common practice regarding research methodology, research design, and data collection and analysis methods. In addition, common research practices do not fully comply with new research requirements recently requested from organizational and innovation researchers by top academic journals. In general, there has been a request for fundamental re-orientation of organization of research in order to challenge assumptions underlying existing literature and create more influential theories (Alvesson & Sandberg 2011). Research on BM and BMI is often exploratory and has the aim of building new theory or inductively enriching existing theory. However, common practices in BM and BMI research designs deviate from a clearly defined, linear research approach (Dubois & Gadde 2013) that addresses research gaps in the literature (Alvesson & Sandberg 2011). As a result, researchers miss insights that accompany methodological alternatives such as the systematic combination and application of non-

binary methods (Polsa 2013). While scholars consider advice from and the perspectives of different stakeholders (e.g., users and practitioners) to some degree when studying the complex situations of BM and BMI, this can be increased by more collaborative interaction to address real-world problems (van de Ven 2007). Regarding the time horizon, the review revealed that BM studies are cross-sectional and mainly examine a situation in a certain point in time and thus are not longitudinal. Thereby, it is clear that working with and studying BM requires time (Bucherer *et al.* 2012) and a dynamic perspective (Demil & Lecocq 2010). Accordingly, there is a need to conduct longitudinal field research to focus on BM change and study long-term processes in context and in real time, which has been referred to as "catching reality in flight" (Pettigrew 1990, p. 268). None of the reviewed articles uses action research, which is somewhat surprising as complex innovation projects such as BMI can benefit from temporary participation with the object of study (Ottosson 2003) and the possibility of developing and testing approaches and frameworks (Lindgren *et al.* 2004). In short, if BM and BMI research were more open to other methodologies (see Polsa 2013) and used more innovative research designs (e.g., Sørensen *et al.* 2010), this could mitigate the frequent theory-practice gap (Sandberg & Tsoukas 2011) that continues to exist due to a lack of theoretical anchoring (Teece 2010). However, it remains to be seen whether the results of such research approaches and designs will be accepted and published in target journals. Until now, case studies and large-scale surveys have found more acceptance and are accordingly more prevalent.

Our review demonstrates that there is not a straightforward relationship between the research community's methodological standards and its methodologies in actual use. We found that common research practice is not fully aligned with the recommendations presented in the methodological and management literature. Research is often "good enough" to get published rather than "good" practice. One of the most common practices found was the absence of methodological discussion. Even if a distinct methodological section or paragraph was provided, it often lacked information about the research approach, research strategy, and data analysis and verification methods. Many authors did not provide basic details about their research design and thus made no methodological contributions that would help improve the field (Bartunek *et al.* 1993). There is a serious need for change in this

regard. A possible solution is the use of a scoring model for researchers and reviewers (e.g., Boote & Beile 2005) to ensure transparent and accurate use of research methodology, design, and methods. Before submitting empirical studies, researchers should ensure that the methods section includes "basic" data that tells a story of how the study was conducted (Pratt 2009).

At this point, we do not recommend a single set of standards for BM research as this would dictate that a specific philosophical approach should be followed. However, this should not be interpreted to mean "everything" is possible. Rather, we make the argument for rethinking methodology as well as research strategy in an attempt to pursue new ways of researching BM and BMI.

6. Conclusion

In this review, we examine how research has been conducted in the field of BM and BMI over the last 14 years. While our review is limited in the sense of being a snapshot solely of research results published in highly ranked journals, it confirms what has, until now, been a general assumption: inductive, explorative case studies are the most popular research strategy in BM and BMI research. Our focus in this article is on research methodology and design and how these are reported in articles published in scientific journals; without knowledge of these, we cannot precisely know how a study was actually conducted. To our knowledge, a review that examines how research is actually conducted has not been attempted previously in the areas of BM and BMI. As demonstrated by our results, a great deal of qualitative research that provides deep insights on the BM concept and phenomenon of BMI has been completed. This supports the creation of new relationships and variables and fosters the exploration of theoretical explanations (Eisenhardt 1989). With a view on the results of previous research, there is no clear indication of how many case studies or survey participants are necessary to obtain significant and valid results. In the end, this depends on research objectives and questions as well as the choice of methodology and research design. However, the results of our review provide an overview of possible research designs and reveal new ways of conducting better research on BM and BMI. Nevertheless, each study should clearly state the methodology, research design, and methods used and provide

justification for these choices. To what extent this information is described depends on the journal in which a study is published and the reviewers.

Our review and presented results have several limitations. First, we considered only articles published in highly ranked journals, which have a preference for accurate and rigorous empirical studies. Hence, many completed empirical studies and works in progress were excluded from our review. Second, while the allocation of empirical articles into the research onion concept is an attempt to structure the current research, it is clear that not every study can be directly assigned to a category. Third, while we carried out the review with great certainty, assessment and allocation were based on subjective judgment. Fourth, the comments and advice on methodology and research design provided in the review should not be considered definitive. Research is always confronted with uncertainty and risk, which makes it necessary to consider many options and proceed with flexibility.

Researchers and management scholars in the fields of BM and BMI will find this paper useful as a transparent and clear analysis of existing empirical research in these fields that represents an appropriate starting point for further research. The increasing number of published research articles in this emerging field supports the view that BM and BMI are hot topics on management research agendas. Researchers will find our review useful to establish that there is no common practice of research strategy and recognize what is generally expected of scholars by highly ranked journals. In general, we support increasing knowledge of methodology for scholars in the community.

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ACTION CASE STUDY - A RESEARCH STRATEGY BASED ON ABDUCTION FOR RELEVANT AND RIGOROUS MANAGEMENT RESEARCH

1. Introduction

Innovation management scholars are often encouraged to use innovative research designs (Sørensen *et al.* 2010) for engaged collaborative interaction with firms to address and solve real-world problems (van de Ven 2007). These designs should lead to results with high practical relevance (Sandberg & Tsoukas 2011) and, ideally, develop into influential theories (Alvesson & Sandberg 2011). However, this is easier said than done. Some scholars advocate that research should begin with generalization and then determination if whether the generalizations are applicable to specific instances. Whereas others recommend beginning with observing specific instances and then seeking to establish generalizations about the phenomenon under study. These processes are known as deduction and induction, respectively (Bryman & Bell 2011). Inductive theorizing is likely the most prominent approach within innovation research. Since 2002, however, abduction has achieved attention in the research community due to an often-cited article that suggests systematic combining as a third, non-linear research approach instead of the mainstream perspective on research (Dubois & Gadde 2002). The authors began a profound discussion about the mainstream literature on case-study methodology (Eisenhardt 1989; Eisenhardt & Graebner 2007; Yin 1984; Yin 2009), which they underpinned in their later 2013 article that further articulated the key features of systematic combining (Dubois & Gadde 2013). Along with other studies (e.g., Easton 2010; Piekkari *et al.* 2010), they revealed several deficiencies in case-study research (e.g., too linear, too unspecific regarding the number of cases, lack of potential for theory building) and requested a general rethinking of the application of methodology. Thereupon, Polsa (2013) examined and discussed several methodological approaches and argued that an approach should aim at creating a dialogue between induction, literature, and multiple methods of analyzing and interpreting data sources (Polsa 2013). Despite these calls for change in research methodology, the diffusion of alternative approaches in the management

research community is still moderate. The lack of details regarding suitable research designs, especially research strategy (Saunders *et al.* 2009), prevents the adoption of proposed alternative methodological approaches. Especially with the increasing requirements for modern research projects, a consistent research strategy and appropriate methodological setup have become crucial (Pratt 2009). Additionally, research design following alternative methodological approaches (e.g., abduction) must meet the expectations of both the research community and, increasingly, practitioners in order to convince them (Sandberg & Tsoukas 2011). This gives rise to the question of how a research design, in particular a research strategy following an abductive methodology approach, should be designed. To the best of our knowledge, abduction has rarely been utilized in the field of management and, when it has been utilized, has been done so unintentionally. Therefore, the aim of this article is to illustrate how abduction (i.e., systematic combining) works from a research-project perspective and how a concrete research strategy, here, action case study (ACS), can be executed within the context of an organization with the aim of examining innovation issues. This article argues that ACS is a promising non-linear research strategy for delivering input for influential theories and meeting scientific goals in terms of relevant and rigorous results while simultaneously addressing practical concerns of organizations (van Maanen *et al.* 2007). Furthermore, it supports the development of self-help competencies in firms facing innovation problems. The proposed ACS strategy provides a contrast to mainstream research approaches such as classic case-study research.

When introducing or proposing a relatively new research strategy or method, it is necessary to keep a close eye on specific requirements. According to Bartunek *et al.* (1993) there are several requirements for successfully applying innovative methodological ideas in management research. We consider these requirements in three ways, which informs the structure of the article. First, chapter 2 explains the abductive approach and the desired knowledge to be generated (i.e., the added value) compared to traditional approaches. Second, chapter 3 introduces and proposes the ACS strategy and illustrates its origin and conceptual foundation. Furthermore, the chapter illustrates the purpose of this research strategy and the underlying methods. Third, as it would be insufficient to simply take a new methodology approach without convincingly testing its power, chapter 4 shares our

experiences with applications of ACS based on abduction in real research settings. We demonstrate what an adequate procedure looks like and share our lessons from this project. Chapter 5 is devoted to discussion and conclusion.

Referring to the claim that it is difficult to make new methodological contributions (Bartunek *et al.* 1993), we are convinced that our article delivers new "food for thought" regarding the suggested reorientation of management research (Alvesson & Sandberg 2011) and revitalization of the relationship between researcher and practitioner (van de Ven 2007). In addition, the article contributes to innovation research in three ways. First, we create and describe a conceptual overview of an abductive research methodology from a research-project perspective. Second, we introduce and propose ACS as an appropriate and promising research strategy for innovation and management scholars. Third, we describe how ACS has been used in a real-world innovation research setting.

2. Abduction and systematic combining

Abduction, which was initially developed by Charles Franklin Pierce (Kovács & Spens 2005), is a combination of fundamental approaches (induction and deduction) in which the researcher moves between the two while practicing constant comparative methods (e.g., Suddaby 2006). Abduction as a midway or hybrid approach in social science involves the logic of reasoning and is a creative and pragmatic process (Carr *et al.* 2004) that avoids the inherent limitations of induction and deduction (Kovács & Spens 2005). The interactive aspect of the abductive approach is related to action research (Checkland 1981; Näslund *et al.* 2010) but can also be found in case-study research (Dubois & Gadde 2002). Abduction reasoning is an important aspect of inquiry based on pragmatism and action learning (Carr *et al.* 2004) and suggests a link to systems thinking (Barton & Haslett 2007). Evidence suggests that researchers can expand their understanding of theory and empirical data by constantly going "back and forth" (Dubois & Gadde 2002, p. 555) between research poles (induction and deduction), following a non-linear process (Storbacka 2011). Researchers work in a circle of iteration, matching theories by systematically combining findings from literature and empirical settings (Dubois & Gadde 2002, 2013). The iterations normally result in a research outcome that can be included in deductive research, a case study, a hypothesis, or a

proposition (Kovács & Spens 2005) (Figure 15).

To map and create a conceptual overview of the abductive approach, we used Checkland's description of research, the FMA framework (F – frameworks, M – method, A – area of concern/ action). The process of systematic combining represents a cycle of action and learning, which is the central idea behind the system-oriented FMA framework (Checkland & Holwell 1998). Furthermore, FMA promotes understanding of abductive research processes as abductive reasoning is commonly used in action research (Kovács & Spens 2005), where collaborative processes and reflective learning are crucial elements (Checkland & Holwell 1998).

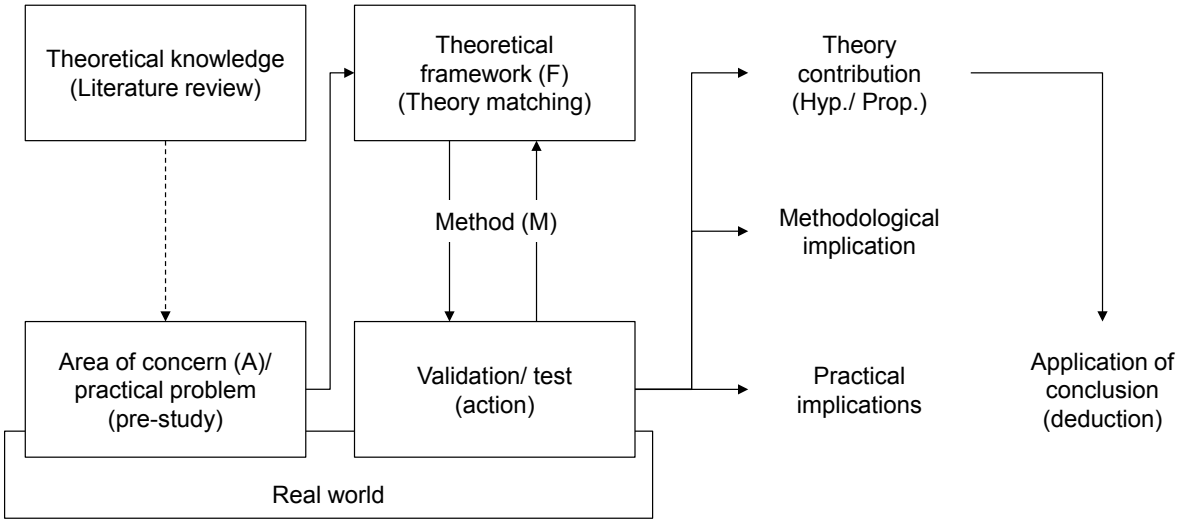

Figure 15: Conceptual overview of abductive approach (Source: author's illustration based on Kovács and Spens, 2005)

To identify a relevant research question, perform relevant, rigorous research, and foster the "ah-ha" effect (van Maanen *et al.* 2007, p. 1148), abduction begins with the area of concern (A) based on data about the phenomenon, which can be gathered through observation of a practical problem (Kovács & Spens 2005) or an explorative pre-study (e.g., Wilson & Post 2013). In most cases, scholars begin the process by examining previous theoretical knowledge and experience (e.g., through literature reviews) as these determine their view on the real world (Dubois & Gadde 2002). From the results of initial real-life observation, they deduce a preliminary theoretical or conceptual framework (F), which consists of preconceptions or first attempts to match theory and practice. The framework can be used as a reference when collecting empirical evidence and provides direction for the search for data.

The goal is to match theory and reality for solving a practical problem by systematically combining empirical data and insights from theory (Storbacka 2011). During this method-driven interaction (M), the framework is successively modified or refined over time according to fieldwork discoveries (i.e., validation) as well as through analysis and interpretation (Dubois & Gadde 2002). The initiated iterations between theory and practice are performed repeatedly until theory matches reality (i.e., they are systematically combined) (Dubois & Gadde 2013).

From a research perspective, the abduction approach can lead to several results. First, it can enrich an existing theory through a modified theoretical framework or uncover completely new aspects in terms of new hypotheses or propositions. Kovács and Spens (2005) argued that it leads to new insights about existing phenomena by examining these from a new perspective. A deduced hypothesis can provide a basis for further research and, accordingly, applying given conclusions. Second, it can have methodological implications in terms of the FMA framework, a recommendation deduced from the research strategy, or learning from application of the method. Third, abduction can lead to concrete and transparent implications for management practitioners in the form of transferable results from their participation in a research project.

3. The action case study

Action case study, initially referred to as the action case (Braa *et al.* 1994), stems from research on information systems in the mid-1990s (Braa & Vidgen 1995). Today, the term refers to a hybrid research strategy applied within organizational contexts. As the name suggests, ACS uses components of both action research (Checkland 1981; Gummesson 2000; Susman & Evered 1978) and case-study research (Eisenhardt 1989; Yin 1984), which supports and matches the usage of abduction as described above. Compared to other research strategies, ACS is located between action research and soft case study (Figure 16). Hard and soft case approaches share similarities regarding research aims and techniques, but the underpinning research philosophies depict them as distinctly different in practice: interpretivist-informed soft case study and positivist-informed hard case study (Braa & Vidgen 1999; Howard *et al.* 2004). The corners of the triangle in figure 16 represent the

desired outcomes of research. Thus, ACS is a hybrid of change (interventionist) and understanding (interpretivist). It contains soft elements such as interpretation, gaining understanding, logical reasoning, and use of qualitative data as well as aspects of action research, thus reflecting the potential of research to change organizational components (Braa & Vidgen 1995). According to these characteristics, ACS has similarities to participative case study (Baskerville 1997) and interpretative case study (Walsham 1995), both of which also enable understanding of the research question in an organizational context through direct participation.

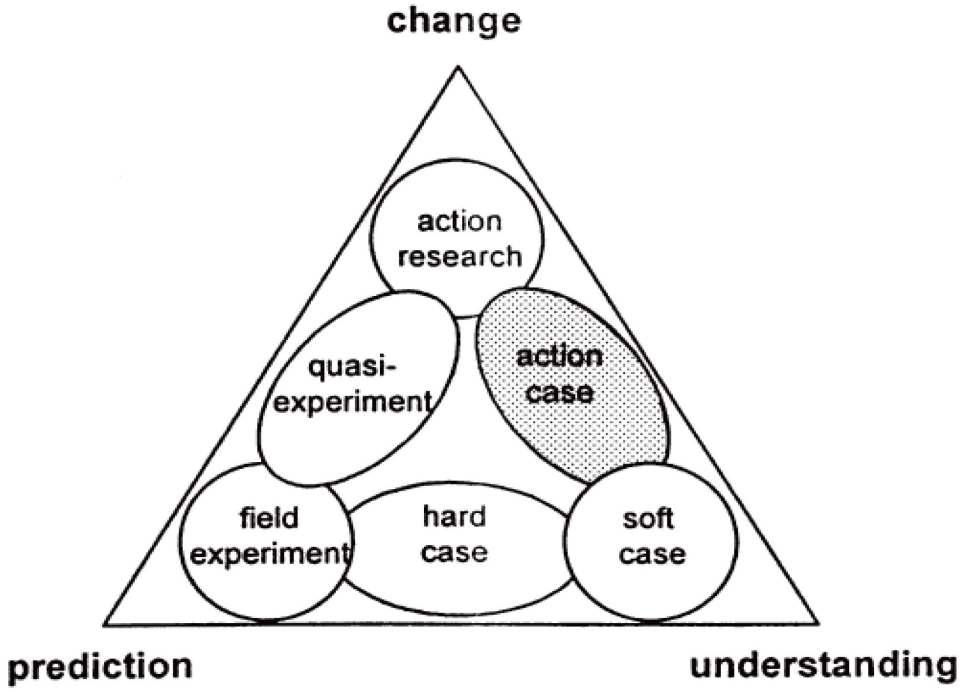

Figure 16: Location of action case study in research context (Source: Braa & Vidgen 1995)

ACS operates on an interface and is useful for interpreting a case study in depth through, for example, archival studies or interviews and interventions (action) via observation or moderated workshops in the past (case study) and present (action) within the distinct environment (i.e., project or department) of the studied organization (Figure 17).

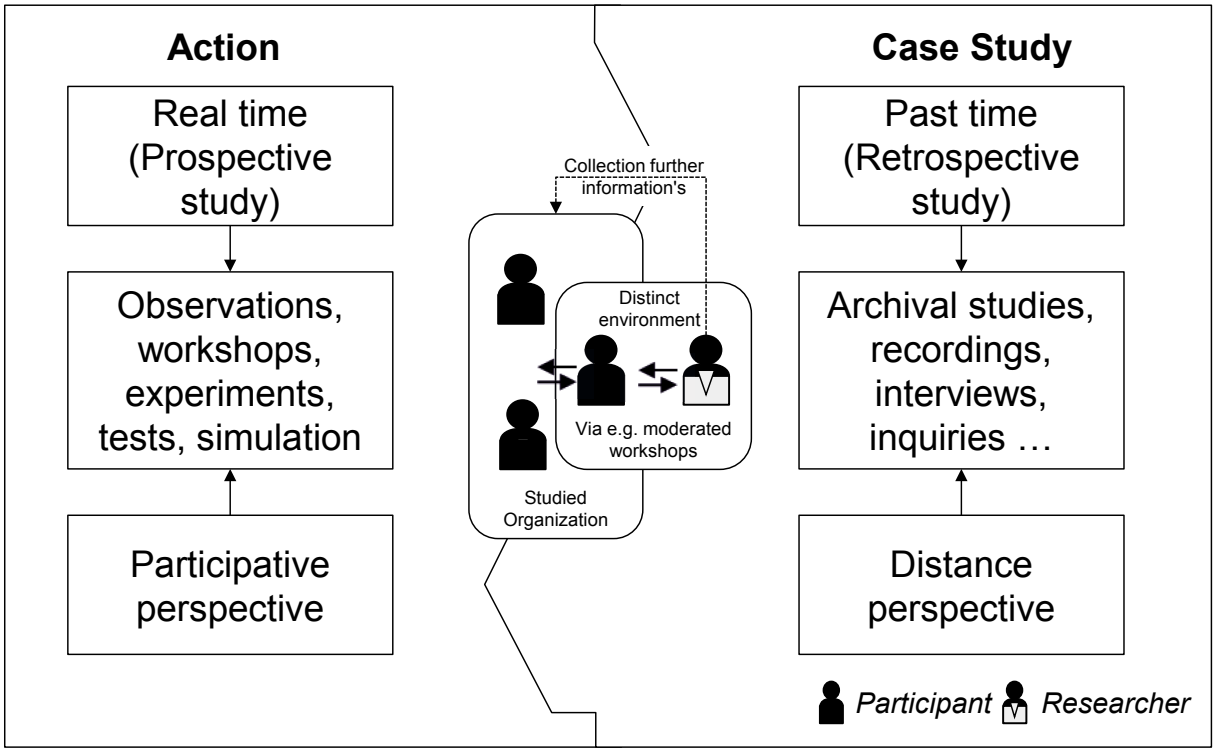

Figure 17: How action case study operates (Source: author's illustration)

In ACS, researchers act as participants in a distinct environment (e.g., a project team). They play an active role in supporting group activities but do not become part of the social group. Professional researchers with varying backgrounds and experience participate in activities. Initiating interaction (e.g., through moderated workshops) offers excellent opportunities for data collection (Pettigrew 1990) and involves iterative processes, including observation, verification, and validation of the theoretical foundation (i.e., the chosen framework). Two primary outcomes are in line with the described abductive logic: (1) an action outcome in the form of an intervention that is beneficial for organizational concerns, and (2) a research outcome in the form of contribution to research questions and theory. The main difference compared to traditional case-study research is the position and role of researchers as participants in a group who accompany the targeted change but do not take center stage. Nevertheless, researchers use data collection and analysis methods similar to those used in other case-study research.

There are several advantages to using ACS, especially in management research. First, it allows real-time testing of theory in a natural environment (Pettigrew 1990). Second, it provides both concrete results (i.e., solving a problem) and conceptual results in terms of

proposed changes to the theoretical framework (i.e., input for the research community (Braa & Vidgen 1995, 1999). Third, it allows gathering more profound and crucial information because research is not conducted from a distance (Ottosson & Björk 2004). Fourth, it enables small-scale changes within an organization through intervention (Ottosson & Björk 2004). Fifth, it leads to research projects with temporary interaction, which have a shorter time span compared to action research (Braa & Vidgen 1995; Pettigrew 1990). Sixth, researchers can actively participate in practical projects without taking center stage or making decisions (Braa & Vidgen 1999). Seventh, participating managers and organizations obtain new insights and can solve practical problems (Braa & Vidgen 1999; Johansson *et al.* 2007).

ACS can serve as a pre-project that later becomes a large action-research project (Johansson *et al.* 2007) with the main goal of accompanying and understanding change over a long period of time (Coughlan & Coghlan 2002). The comparison of action-based research with consulting projects can lead to several misunderstandings. Indeed, a set of three dilemmas in action research has been specified (Warmington 1979): goal, value, and role. A closer look at the three supposed dilemmas reveals clear differences. The goal may be similar but internal motives of consultants and researchers are different (scientific prospect vs. commercial benefit). The value for participating companies is achieved through contingent learning (researcher) vs. knowledge transfer (consultant). The roles of researchers and consultants are both professional, but in the first case, the commitment is fundamental and must be explicitly accepted by both researcher and firm. Baskerville (1997) discussed the contrast between action research and consulting in more detail.

4. Application of action case study based on abduction

When considering abduction and ACS in detail, the question arises as to whether ACS as a research strategy based on abduction is applicable to the investigation of innovation phenomena and whether it allows testing the conceptual framework of a small-scale project. So far, ACS has been applied in studies[80] on operational management (Gibbons *et al.* 2012), procurement (Howard *et al.* 2004), decision and negotiation (Johnson & Lipp 2007),

[80] These studies mostly applied the action cases defined by Braa & Vidgen or a variation of these.

information systems (Nurmi *et al.* 2011), and informatics (Househ *et al.* 2011). However, to the best of our knowledge, ACS has not yet been utilized in the field of innovation management. Therefore, we introduce ACS as an appropriate and promising research strategy for examining the phenomenon of business model innovation (BMI) and describe how it has been used in an actual research setting.

Between September 2013 and April 2014, three action case studies on the subject of BMI were conducted with incumbent firms from mature industries in the context of a study at the University of Potsdam in Germany. The goal of the research was, on one hand, to gain new insights for better understanding BMI, on the other hand, to sensitize and help selected firms think outside the box and renew their business models. Firms in mature industries are interesting study objects, especially concerning innovation and business model aspects. These firms are more reactive concerning business model renewal (Andries & Debackere 2007) and have a great need to catch up regarding BMI. Following abductive logic and considering the conceptual overview described above, we began with a literature review to get an understanding of the current theoretical knowledge about research in BMI with a focus on mature industries. This helped us draft a first research question and set the investigation focus. With initial theoretical knowledge in mind, we conducted a short pre-study with nine interviews, mainly with firms from mature industries (e.g., pharma, energy, defense, publishing, and railway/transport) to examine the BMI status quo from the practitioner's point of view. Afterwards, we analyzed the results of the pre-study to identify challenges and refine the initial research question of how firms from mature industries can systematically tackle the management of BMI. Once the area of concern (A) was understood, we began an extensive search for and evaluation of an appropriate theoretical framework. We adapted the system-oriented functional market concept (FMC) originally developed for technology management purposes (Pfeiffer *et al.* 1997; Weiss 2004) as a framework (F) for the management of BMI. The FMC considers innovation from a systemic perspective (Carlsson *et al.* 2002) and is well grounded so that practitioners receive appropriate guidance (Weiss 2004). To match theory with reality and solve practical problems, we conducted three action case studies with selected firms using the following methods (M): (1) understanding phase using case-study analysis methods; (2) action phase in which workshops were developed

(based on FMC), conducted several times, and evaluated; (3) refinement and development phase in which the results were summarized and compared via cross-case analysis (Eisenhardt & Graebner 2007). We matched the findings with theory and slightly refined the FMC framework. All workshops were conducted within a time span of about four months. Our empirical evidence after several interaction cycles consisted of 18 interviews, notes from almost 20 hours of recordings generated in seven workshops, and 19 completed evaluation forms from workshop participants. Lastly, we held a final focus-group discussion about the compiled concept for the management of BMI. In total, 11 company representatives from different mature industries (including those from participating firms) validated the concept.

After successfully conducting three action case studies, we can confidently state that ACS based on abduction is an adequate research strategy for BMI research projects for several reasons. First, action participation is an ideal way to study complex innovation activities such as BMI (Ottosson 2003). Second, participation through ACS prevents the "fly on the wall" effect (Baskerville 1997, p. 28) compared to traditional case studies, where personal interest in improving organizational performance is low and results in an outside perspective of a firm's projects. Third, it enables application and examination of existing theories or frameworks from other disciplines (Braa & Vidgen 1995). Fourth, business model aspects can be studied profoundly and in real time, thus "catching reality in flight" (Pettigrew 1990). Fifth, using ACS encourages practical application of innovation concepts and processes, which has been suggested by many researchers (e.g., Sørensen *et al.* 2010).

5. Discussion and conclusion

ACS is a hybrid research strategy based on abduction (i.e., systematic combining). It encompasses both positivistic reductionism (Susman & Evered 1978) and interpretivist understanding, which facilitates the development of generalizable theories (Bryman & Bell 2011). However, there is an apparent separation of theory and practice, as scholars read published research more often than practitioners.

Practitioners frequently complain about the lack of relevance of published research for the problems they face as well as the lack of responsiveness of researchers to meeting their

needs. A greater focus on abductive logic in combination with ACS can overcome these problems. This should not lead to the impression that future research should move in the direction of "academic consulting". It should be clearly noted that researchers focus on methods, theory development, and evaluation instead of using methods only to solve practical problems and ensure concrete benefits. However, with the application of ACS, the expectations of researchers and practitioners can be more closely merged without reducing benefits for either. Researchers can obtain deep insights (in our case, into innovation practice), observe and interact with real-world organizational and managerial problems, and collect large valid data sets. Participating firms and managers receive new stimuli in the form of new scientific input, concepts, and, in the best case, solutions for their problems. As previously described, it can be assumed that many research projects focusing on close interaction and intervention struggle with differentiation between action research (i.e., longitudinal, focus on change, central role of the researcher) and traditional case-study research (i.e., deep understanding, use of past data, distance from the research object). Furthermore, evidence suggests that engaged scholars have an increased interest in (and need for) action and intervention (van de Ven 2007). Unfortunately, there are still shortcomings in methods and the conception of ACS. This can be avoided by adapting ACS based on abduction. To sum up, ACS strives to contribute to practical concerns of organizations while simultaneously accommodating scientific goals (Näslund *et al.* 2010). Therefore, ACS represents research in action rather than research about action (see also Coughlan & Coghlan 2002).

Our presented results in the form of concrete applied action case studies demonstrate that ACS based on abduction (i.e., systematic combining) as a research strategy is a serious combination and an alternative to existing research designs. Especially within innovation research, this novel research strategy can encourage pronounced reorientation (Alvesson & Sandberg 2011). As innovation projects are often complex and dynamic, action-based research designs using ACS are promising. While conducting three action case studies (for the first time in this field), we collected several observations that are relevant for future research projects following a similar strategy. When planning and preparing for ACS, researchers should verify capabilities and participating firms must agree to a strong

commitment to the project. As ACS is a challenging approach, it requires confident and experienced researchers who can work with the uncertainties of organizational change in real time (action) and are experienced with handling qualitative research methods such as case studies.

Practicing ACS research is more of a social process than a technical task (Pettigrew 1990). Therefore, there is increasing demand for the ability to create relationships with managers of the organization where an intervention takes place. Social skills are crucial, which means that researchers must be able to handle several interests (sometimes hidden in the early stage) of various groups and stakeholders. To have a clear basis for collaboration, it is helpful to sign a collaboration contract. This officially ensures interaction and commitment and enables better access for researchers. However, the degree of involvement, the desired results for both sides, and respective roles must be clearly defined or a project can merge into action research or even fail at an early stage. Managers from participating firms must commit to and accept the work style of researchers attempting to achieve a balance between data collection through long, open discussions and the need for practical problem solving (see also Johansson *et al.* 2007). With the aid of ACS, we gathered profound and interesting results in our research project that we employed for the development of a new concept for BMI. We noted that a research project based on ACS can be a pre-project for a long-running action-research project with multiple benefits for all participants. In conclusion, we believe that ACS based on abduction can produce relevant and rigorous research findings in several scientific discipline.

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USING ACTION CASE STUDY RESEARCH TO EXPLAIN BUSINESS MODEL INNOVATION – EXPERIENCE FROM PHARMACEUTICAL, DEFENSE, AND ENERGY INFRASTRUCTURE

1. Introduction

Currently, both business and society are driven by several global phenomena (e.g., digitization and individualization) and technological innovations (Baden-Fuller & Haefliger 2013) embedded in overall technological progress (Pfeiffer 1971). This progress, combined with rapidly changing market environments, changing customer needs, and the rise of new disruptive business models (Markides 2006), is leading to major changes for incumbent firms and their way of "doing business" (Amit & Zott 2015). On one hand, this creates inconveniences for incumbent firms. On the other hand, new opportunities arise with different impacts for each firm or organization (Dewald & Bowen 2010). However, many managers are still focusing on process optimization rather than acting as innovators or entrepreneurs even though competitive advantages based primarily on efficient processes have lost their relevance. Impending change requires renewal and adjustments for incumbents, but this process is not unfolding equally in all industries (Andries & Debackere 2007). Mature industries such as pharmaceutical, defence, construction, and infrastructure industries (to name just a few), tend to be affected quite late by exogenous change (shocks). Business model (BM) renewal began to appear on the management agenda in the last years, incited by dramatic changes such as patent expirations for pharmaceutical firms or shrinking government budgets for defence firms. The potential for improvement regarding overall system inefficiencies is quite high in mature industries (IBM 2010). These firms have a great deal to lose in terms of market leadership and profit margin, but their structures are cumbersome and often poorly prepared for upcoming changes. Thus, the survival and future position of incumbent firms depend on how fast they respond to changes in their interdependencies and how quickly they explore and implement new BMs (e.g., Björkdahl

2009; Sabatier *et al.* 2012; Teece 2010). Accordingly, there is urgency for incumbent firms in mature industries to revolutionize their industry through innovation before others (mostly new entrants) do. This innovation is not about the optimization of individual issues, assets, and processes but rather about renewal of existing BMs (Johnson 2010).

The goal of our research is twofold. First, we examine the processes of business model innovation (BMI) in detail to gain new insights to promote a better understanding of the phenomenon. Second, our research sensitizes and helps firms in mature, mostly conservative industries to think outside the box and learn how to renew their BMs. As knowledge about BMI concepts and processes is quite limited and seldom executed in practice (e.g., Achtenhagen *et al.* 2013), we conducted fieldwork in firms while applying a literature-based concept for managing BMI. Especially in mature, technology-based but less innovative firms, there is significant need for a systematic process for BMI that enables creation of new BMs that are as radical as they are applicable (Sandström & Björk 2010). We adopted the system-oriented functional market concept (FMC), which originated in technology management (Pfeiffer *et al.* 1997; Weiss 2004), and slightly adapted the concept during our investigation to finally propose a concept for managing BMI in incumbent firms from mature industries. For our research, we chose abduction methodology as a non-linear research approach (Dubois & Gadde 2002, 2013) and conducted three action case studies[81] (in the pharmaceutical, defense, and energy infrastructure industries). Following this approach, we concentrated primarily on problematization in terms of solving real problems rather than spotting gaps (i.e., searching) in the literature (Alvesson & Sandberg 2011). Over the course of our study, we moved through a series of "back and forth" revision cycles between theory and practice (Dubois & Gadde 2002), which allowed us to generate findings that promote a better understanding of BMI in applied settings. This responds to a prominent request for better understanding within recent academic literature (Martins *et al.* 2015). The findings provide knowledge of how new BMs can be created (Zott *et al.* 2011) as well as how a theoretical concept (i.e., the FMC) works in practice (Sørensen *et al.* 2010, p. 314) in firms from mature industries. Furthermore, we highlight challenges associated with BM renewal and provide

[81] For a comprehensive explanation of action case study see article IV.

suggestions on how to overcome these. Finally, we suggest opportunities for further research by making a number of propositions.

The paper sets out certain theoretical considerations and briefly reviews the status quo of discussion in the literature regarding BM approaches and BMI. As BMI is our research focus, we highlight several existing knowledge gaps in order to provide supportive arguments for our research intention. Chapter 3 describes our chosen research methodology and research design. This is essential because abductive methodology combined with action case studies as a research strategy is relatively new. We demonstrate that this approach is appropriate for studying innovation topics through theory-guided and practice-oriented interventions by scholars. Chapter 4 explains how we collected and analyzed qualitative data from pre-study interviews and conducted our action case studies (main study) following the abductive approach. Chapter 5 presents the pre-study and main-study findings. To generate clear results and enhance the contributive quality of our study, we emphasize necessary adaptations to the applied framework (i.e., the FMC) and make propositions based on each phase of BMI. Finally, we discuss and conclude our overall findings in chapter 6.

2. Theoretical considerations

Innovation as convergence of technology (push) and demand (pull) (Pfeiffer 1971) is one of the most important topics in business and research today (Crossan & Apaydin 2010). Although there are conflicting theoretical predictions, persisting knowledge gaps, and theoretical inconsistencies (Keupp *et al.* 2012), the management of innovation is considered a critical source of competitive advantage for firms (e.g., Knyphausen-Aufsess 1995) and even nations (Abernathy & Clark 1985). On one hand, innovation is a process that describes a system consisting of a cycle of divergent and convergent activities. On the other hand, innovation is an outcome that answers the questions, "What is it?" and "What kind is it?" and characterizes the form (i.e., product, service, process, business model) and magnitude (gradual/principle or incremental/radical) of innovation (e.g., Crossan & Apaydin 2010). Since the *Long Range Planning* special issue (2010) on BMs, BMs and BMI have received extensive attention from innovation scholars (among others). However, the discussion around the BM concept is diverse and characterized by a multitude of definitions,

approaches, perspectives (e.g., Morris *et al.* 2005; Zott *et al.* 2011), and criticisms regarding its theoretical anchoring (Teece 2010). Nevertheless, both researchers and practitioners (George & Bock 2011) have paid a great deal of attention to the subject and made efforts to grasp "the core of it" (DaSilva & Trkman 2013). Based on the current literature, the following statements should be considered in any in-depth theoretical evaluation:

(1) The emergence of the BM as a concept (Zott & Amit 2010) aids understanding, explains the "logic of the firm" (Casadesus-Masanell & Ricart 2010) in terms of value creation and performance, and underpins firms' competitive advantage (Zott *et al.* 2011). There has been general consent on the notion that the BM describes what customers want, how they want it, and how an enterprise can best meet these needs and get paid for doing so (Gambardella & McGahan 2010; Teece 2010). Researchers have even assumed that benefits from a technological innovation remain latent until it is commercialized through a business model (Chesbrough 2007; Baden-Fuller & Haefliger 2013).

(2) Working with the concept of the BM enables managers to think in a customer-centric way with respect to a company's intended value proposition. Models simplify reality in order to facilitate better understanding of how something works (Morgan 2012). They have great importance in the cognitive process and provide a solution for dealing with gaps in knowledge (Baden-Fuller & Morgan 2010). Combining models with a conceptual view of the BM as an activity system with interdependent activities (Zott & Amit 2010) reveals similarities to systems thinking (e.g., Halecker & Hartmann 2013; Petrovic *et al.* 2001). In both business modeling and systems thinking, systems are composed of elements, linkages between these elements, and dynamics (Afuah & Tucci 2001).

(3) BMI, also described as strategic innovation (Markides 2006), plays a major role in firms' business development (Sandström & Björk 2010). BMI as a process aids in searching for and developing new business logic (Casadesus-Masanell & Zhu 2013) and finding new ways to create and capture value (Zott & Amit 2010), which can lead to a differentiated competitive advantage (Teece 2010). This can be an informal process of experimentation and learning (Bingham & Kahl 2014; McGrath 2010;

Sosna *et al.* 2010) or a more formal process (Demil & Lecocq 2010) as a response to changes in the environment (e.g., Chesbrough 2010) or technological innovations (Baden-Fuller & Haefliger 2013). Both processes are attempts at accelerating the always-continuous process of evolution (Dunford *et al.* 2010).

When considering business development through BMI, most proposed BMI approaches in the literature tend to represent "inventions" rather than genuinely novel innovation and lack documentation of practical application. The literature is also primarily focused only on the ideation phase (e.g., Enkel & Mezger 2013), which impedes the discovery of proof of concept since application in real-world settings is limited. Furthermore, evaluation approaches for BM ideas or alternatives generated after the ideation phase are frequently missing (Schneider & Spieth 2013) but are much needed for decision making (Markides 2006). Overall, it is necessary to learn more about the processes around creating new sustainable and sensible business models that align with the exploitation of emerging market opportunities (Zott *et al.* 2011; Martins *et al.* 2015). There is a lack of guidance within the literature (Wirtz *et al.* 2010) and organizations (Bock *et al.* 2012) regarding BMI processes, and few firms have established an end-to-end BMI process thus far (Bucherer *et al.* 2012). In particular, the transition phase between the invention stage and the innovation stage is poorly mapped (Reuver *et al.* 2013). Thus far, systematic studies focused on generating a better understanding of the BMI phenomenon (Bock *et al.* 2012; Dmitriev *et al.* 2014) and supporting firms, especially incumbents, with appropriate concepts to improve BM development are in short supply (e.g., Kim & Min 2015).

Firms in mature industries have a significant need to renew BMs in order to overcome specific industry changes, find answers to new market disruptors, and increase or at least maintain profitability (Sandström & Björk 2010). A mature industry is characterized by high competition among incumbents, mainly incremental innovation in mature products and processes, a (formerly) high profitability and margin rate, and high entry hurdles for new firms due to factors that include asset intensity and regulation (e.g., Swaminathan 1998; Barth 2003). Few studies have explicitly studied the BM concept in these industries (e.g., Sabatier *et al.* 2012). Moreover, firms in mature industries are reactive regarding BM renewal (Andries & Debackere 2007) and have a great need to catch up (Chandler *et al.* 2014). New

market disruptors (i.e., start-ups) create BMs continuously and show "the elephants [incumbent firms] how to dance" (Belasco 1990). Start-up founders are fully dedicated to their ideas, have little regard for incumbents, and are able to put new BMs into practice within weeks. They dominate the customer interface and are truly changing the customer experience (Westerman *et al.* 2014) whereby incumbents have become nothing more than providers of products and services (i.e., infrastructure). Thus, incumbent firms in mature industries need to manage their BM activities in a competitive way. However, this is exactly where the problem lies. In short, there is a lack of understanding about how these firms can systematically tackle the management of BMI to find appropriate answers to handle impending change.

3. Methodology and research design

Firms in mature industries are interesting objects of study, especially regarding innovation. Our decision to focus on firms in mature, asset-intensive industries is intended to make a first contribution to initiating debate on the use and diffusion of BMI in these industries. To make this contribution and ensure high-quality research in terms of accuracy, generality, and simplicity (Saunders *et al.* 2009), our methodology is based on an abductive approach (i.e., systematic combining) (Dubois & Gadde 2002, 2013). This approach is "a non-linear, path dependent process of combining efforts with the ultimate objective of matching theory and reality" (Dubois & Gadde 2002, p. 556). At the same time, it a useful research approach with the aim of discovery and learning (Suddaby 2006). For the research design, which describes the research setup and methods used, we chose the action case study, which is a novel hybrid research strategy in innovation research (see article IV). This strategy includes components of both action research (Checkland 1981; Susman & Evered 1978) and case-study research (Eisenhardt 1989; Yin 1984) and is perfectly suited for an abductive approach (Dubois & Gadde 2002). Action case study contains soft elements such as interpretation, gaining understanding, logical reasoning, and qualitative data (e.g. interviews and secondary data) as well as components from action research (e.g., actions and interventions via workshops) and thus reflects the potential for research to change organizational components (Braa & Vidgen 1995).

The main argument for using action case study in our research setup is that it allows testing a theoretical concept (the FMC) as a framework in real time in a natural environment. Furthermore, the research has a clear framework and can evolve during the study as "the original framework is successively modified, partly as a result of unanticipated empirical findings, but also on theoretical insights gained during the process" (Dubois & Gadde 2002, p. 559). Furthermore, our research question requires a more active role in real processes and a continuous moving back and forth between empirical and theoretical constructs (Dubois & Gadde 2013; Polsa 2013). The selected approach encourages concrete conceptual results and active participation of researchers in the research project without taking center stage. Therefore, our three conducted action case studies could be used for in-depth analysis of interventions (actions) through workshops in real time within a distinct environment (i.e., project or department) of the studied firms (in the pharmaceutical, defense, and energy infrastructure industries). This ensures a balance between interpretation of qualitative data and interventions with the aim of finding solutions for practical problems as well as creating new insights for facilitating better understanding.

Before developing the initial research question, it is helpful to consider early studies that have explored ideas by inductive research via interviews (Checkland & Holwell 1998). Accordingly, we conducted a pre-study in the spring and summer of 2013 that comprised nine interviews of approximately 60 minutes each with managers responsible for business development, strategy, or innovation from established companies, mainly from mature industries. We combined the results of this first research activity in a real-world environment with findings from the literature review in order to consider the main findings and discussions in both theoretical and empirical settings.

We structured the subsequent three action case studies in the following way: (1) understanding phase using case-study analysis (mainly interviews); (2) action phase in which the workshop concept was developed based on FMC, conducted several times, and evaluated; and (3) the refinement and development phase in which the results were summarized and compared in order to adapt the concept. Hence, as researchers, we did not solve problems for others (i.e., the firms) but *with* others through a process of joint learning, which demonstrated that "the knowledge is in the action" (Ottosson 2003, p. 91). Our (main

study) material consists of 18 interviews (participating practitioners and additional experts) that each lasted an average of 45 minutes, notes from almost 20 hours of workshop recordings, and 19 complete evaluation forms from workshop participants. Interviewees and workshop participants held middle and top management positions and were mainly responsible for innovation, business development, or (portfolio) strategy.

As no specific qualitative data analysis method is recommended specifically for abductive research, we relied on the method proposed by Gioia *et al.* (2013). Gioia *et al.* (2013) viewed the research process "…as transitioning from 'inductive' to a form of 'abductive' research, in that data and existing theory are now considered in tandem…". Moreover, they proposed a two-step coding process for semi-structured interviews in studies using qualitative data to provide deep and rich theoretical description of contexts within organizational phenomena. In the first-order analysis, we attempted to distil categories. Next, we searched for similarities and differences among these categories and clustered the second-order, theoretical-level themes, answering the important question of "what is happening here?". Finally, we further distilled the emergent second-order themes into "aggregate dimensions". Following this procedure, we created a base data structure (see figure 18). This data structure is a key component for ensuring rigor in qualitative research (Pratt 2009).

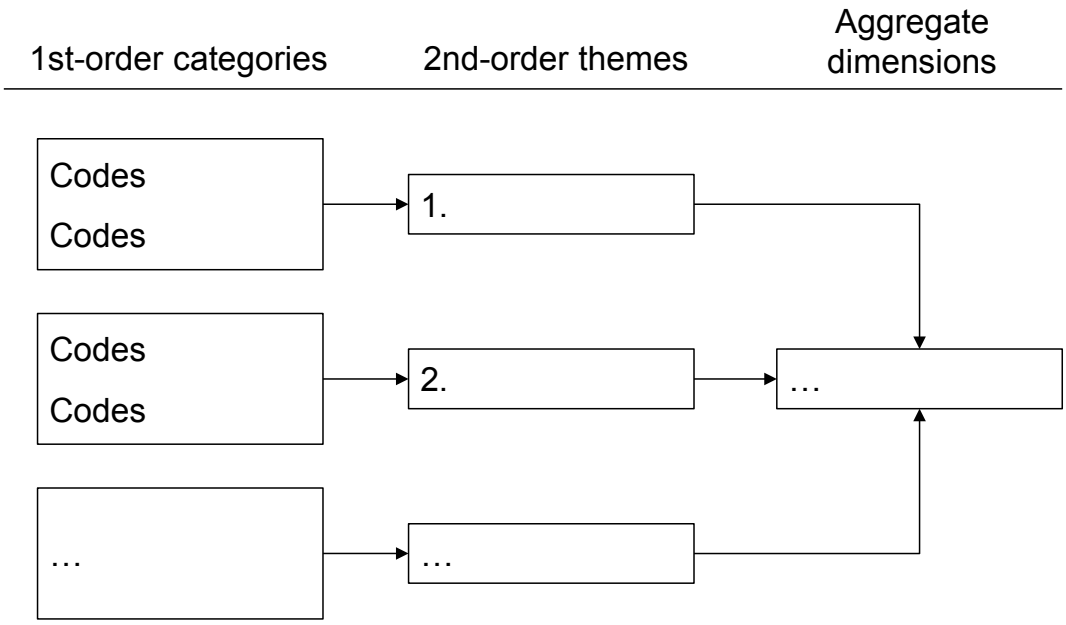

Figure 18: Procedure for creating a structure from qualitative data (based on Gioia et al. 2013)

The selected methodology and applied research design represent a step toward the fundamental reorientation of organizational research (Alvesson & Sandberg 2011) requested from engaged scholars (van de Ven 2007) and enable studying the BMI phenomenon in real time, or "catching reality in flight" (Pettigrew 1990, p. 268). Additionally, it demonstrates a novel way of examining complex innovation projects such as BMI through practical application (Sørensen *et al.* 2010) and temporary participation (Ottosson 2003). Furthermore, the chosen research design mitigates the frequent theory-practice gap (Sandberg & Tsoukas 2011).

4. Data collection and analysis in the procedure of abductive research

After creating a procedure for our research (see figure 19) in line with recommendations for abductive research (Dubois & Gadde 2002, 2013), we collected and analyzed data in various steps (i.e., pre-study interviews, theoretical framework work selection, three action case studies during the main study) to validate the framework in an applied environment.

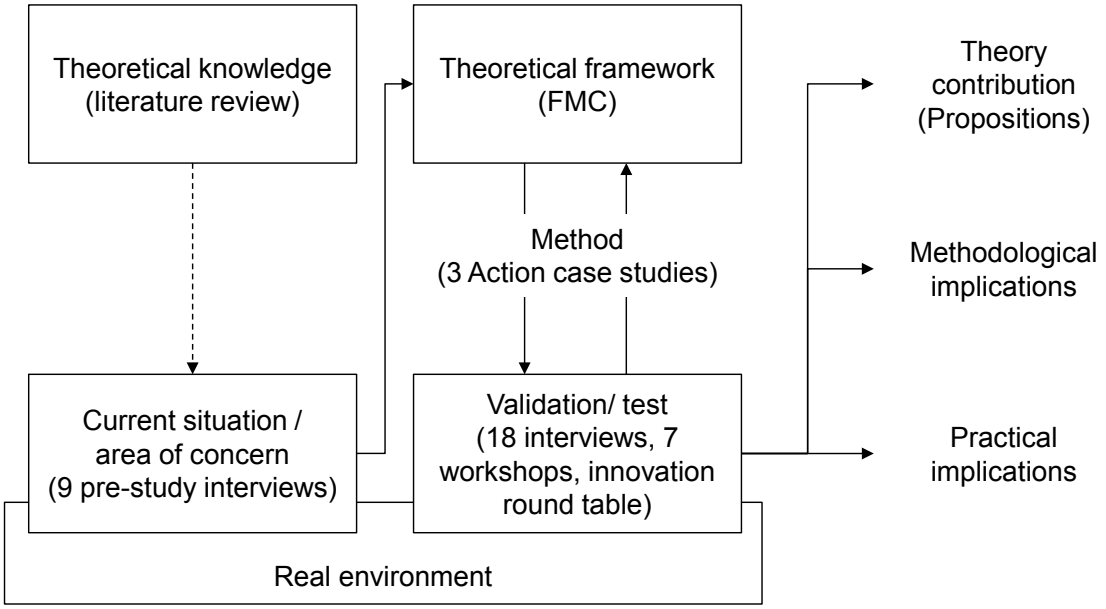

Figure 19: Our abductive research procedure

The first step in our theory-driven data collection consisted of framing the current situation and area of concern regarding BMs within mature industries through pre-study interviews.

When conducting the nine pre-study interviews, we focused on BM innovation and renewal. We asked the interviewees to explain their current understanding of the term "business model" and the interplay between corporate strategies. In addition, interviewees explained their firm's existing BM and described the methods their company uses. The last part of pre-study interviews concentrated on activities regarding BM renewal and BM innovation as well as upcoming challenges within these activities. We systematically coded interview transcripts to identify BM activities according to the responses of our informants. In addition, we searched for data related to challenges, implications, enablers, hurdles, and other potential factors that may influence the BM renewal or innovation process within incumbent firms from mature industries.

In the first-order data analysis, we directly assigned 114 first-level codes to statements in the interview transcripts. We revised these and standardized, clustered, and merged similar codes into 50 first-order categories. An example of a first-order category is "interplay between strategy and business model". At this point, we began to develop the more abstract second-order, theoretical-level themes while considering the level of informant terms and codes. We derived these themes, which differ from first-order categories, from theory-driven interpretations of the data. We aggregated the 12 second-order themes (e.g., "BMI enabler") that emerged into three dimensions: location of BM and BMI; trigger of BM renewal; and challenge in BMI. These dimensions underpin and structure our findings presented in chapter 5.

After analyzing the results of the pre-study, we defined the initial research question, "How can incumbent firms from mature industries systematically tackle the management of business model innovation?". Based on understanding gained from the initial real-world observations (i.e., pre-study), we chose FMC as an appropriate theoretical framework to match theory with reality and solve the practical problems encountered during the course of research. The FMC is a well-founded theoretical concept that considers innovation from a systemic perspective (Carlsson *et al.* 2002) and has been proven in practice. Its application avoids unsuitable recipes and ensures that practitioners receive appropriate guidance. Originally, FMC was an instrument of technology planning based on systems thinking aspects that allowed firms to master the challenges of innovation-related opportunities and

threats in competitive environments (Pfeiffer *et al.* 1997; Weiss 2004). The primary characteristic of FMC is the omission of descriptions and evaluations based on the status quo and the focus on a future-oriented perception of business innovation opportunities through functional abstraction (i.e., functional thinking) of the observed object. The abstraction focuses on reducing a problem to its underlying function and the related benefit to customers (Pfeiffer *et al.* 1997). This process broadens the range of solutions, exploits market opportunities beyond current applications, and creates relationships between problems and solutions regardless of market and cognitive boundaries (Weiss 2004). First attempts by innovation scholars have shown that this concept (or parts of it) can help with the process of BMI (Brunswicker & Hutschek 2010; Enkel & Mezger 2013) as it is partly embedded in the concept of open innovation (Carlsson & Kutvonen 2011). Other research methods based on a similar understanding during exploration are analogical thinking (Gassmann & Zeschky 2008), analogical reasoning (Martins *et al.* 2015), and cross-industry analogies (Kamprath 2011). However, the majority of current approaches focus on the ideation and exploration phases only. None include the evaluation and implementation aspects of the FMC, even though these are the most challenging aspects of innovation practice (Martinsuo & Poskela 2011).

Further characteristics of the FMC that serve as arguments for its transfer to the field of BMI include (see also Brunswicker & Hutschek 2010): (1) it provides a profound theory-based and practice-oriented approach to strategic innovation; (2) it enables early identification of fundamental demand and problem areas as well as market changes to uncover the need for renewal of the business (model); and (3) it represents a holistic, integrated, and interdisciplinary (focusing on technology and innovation) and hence system-oriented concept to manage complex innovation projects.

After putting in place an appropriate theoretical framework (i.e., concept) to examine the research question and dissolve areas of concern, we conducted the main study composed of three action case studies. The conducted action case studies delivered an extensive set of data for analysis (see table 8).

Table 8: Data set of three conducted action case studies

	Int. pharmaceutical company	Int. energy infrastructure service provider	Defense manufacturing company
No. of interviews	5	3	4
No. of workshops	3	3	1
No. of workshop participants (total)	9	13	3
Management level of participants	top	top/middle	top
No. of participating researchers	2	2	1
Average workshop duration (hours)	3,5	4	4

All three firms were participants in the pre-study and agreed to research collaboration through action case studies. We conducted the main-study interviews with selected workshop participants before the first workshop. The interviews with participants focused on the current situation regarding BMI activities, especially the detailed steps of the FMC (i.e., exploration, evaluation, action plan). An additional focus was on specific requirements and expectations regarding interaction through planned workshops. We used parallel, secondary data (e.g., internal reports and presentations) from each firm for triangulation. To further enrich the data set and discuss early findings from the action case studies, we conducted seven additional interviews with experts and other practitioners (see table 9).

Table 9: Additional interviewees

No.	Position	Industry	Years of experience
1	Manager Business Innovation	Automotive	>15
2	Partner	Consulting	>15

3	Innovation Manager	Insurance	>5
4	Head of Business Development	Film producer	>10
5	Head of Strategy	Infrastructure	>15
6	Manager New Business	Publishing	>5
7	Senior manager	Research	>10

Systematically coding the main-study interview transcripts in a way that corresponded to the pre-study procedure data set helped with data analysis. In the first-order analysis, we directly assigned 148 first-level codes to statements in the 18 interview transcripts. We revised these and standardized, clustered, and merged them into 116 first-order categories such as "scenario technique". Next, we developed second-order, theoretical-level themes, always considering the level of informant terms and codes. Finally, we aggregated the 31 second-order themes that emerged into five dimensions: serious situation; overall process challenges; varied exploration; two-fold evaluation; and action planning.

Next, we used cross-case analysis (Eisenhardt & Graebner 2007) to compare insights across the action case studies to identify constant elements and consistent patterns. We clarified discrepancies and inconsistencies in the patterns that surfaced by revisiting the data wherever possible. At this point, several cycles of iteration between theory and empirical data helped us adapt our framework, refine our findings, and clarify their contribution to existing theories and literature.

Finally, in April 2014, we presented the results of the pre-study and main study and validated them through discussion with additional practitioners. In an "innovation round table", we presented the results to 12 delegates from a range of industries and business functions. This focus group supported the presented results and made few suggestions for revision.

The synthesis of all findings and insights from the data analysis lead to several findings, which raise the degree of theoretical contribution in terms of propositions as well as methodological and practical implications. The findings are divided into pre-study and

main-study findings and presented in the next chapter.

5. Findings

This chapter describes the findings from the pre-study and the main study. For the main study, each phase of the FMC applied in the action case studies is presented separately and then converged and discussed in the next section. We use representative quotes (P = pre-study; M = main study) to illustrate our interpretations.

5.1. Main findings, pre-study

Analysis of the interviews from the pre-study indicated that the terms "business model", "strategy", and "business development" are intensively discussed in firms from mature industries with the level of application varying by firm. Some firms had previously worked with BM methods and used the concept for a range of business development activities. Others focused on answering fundamental questions that arise when initially developing BMs (Morris *et al.* 2005, p. 730). The data shows that most firms have a defined strategy with different methods in place (e.g., balanced scorecard, strategy map, strategy club) and classify the BM approach one level below the strategy approach with clear focus on strategy deployment. One manager noted, "The business model has to show how we have to deploy our business to answer strategic questions" (P8). For mature industries especially, the business environment is changing radically and profits are decreasing, in some instances at a high level and a rapid pace. One interview partner explained "…if firms reach a significant level of pain in terms of shrinking profit, somebody from management becomes willing to invest money. This 'pain-level approach' shows that 'dinosaur firms' also mobilize toward renewal topics if the pain-level reaches a critical point" (P3). The market environments of mature industries are generally quite complex due to asset intensity and high regulation, which have kept new entrants out over the past decades (e.g., Barth 2003; Swaminathan 1998). With modern technologies and direct customer interaction, new entrants (e.g., start-ups) can disintegrate former market barriers and attack incumbents on their home territory. While firms from mature industries have high potential for improvement in (IBM 2010), our data substantiates that they also have much to lose in terms of market position, growth rate,

and profit margin. Despite the urgent need for renewal of existing structures and innovation of business models, these firms are unfamiliar with such considerations and activities: "We are not accustomed to caring about fundamental questions [regarding business model renewal]" (P9). This can lead to pervasive discussion about profound business model renewal and innovation activity, where current product portfolios and existing core competencies act as initial starting points. During the pre-study, we found no firm that had an established process or concept for business model renewal or innovation. This underpins other study results (Andries & Debackere 2007) that have indicated firms from mature industries are mostly lagging behind regarding concepts or processes for BM renewal or BMI. These firms are reactive in terms of how to catch up on idea generation and transfer them into profitable new business models. One interview partner referred to this, saying "the main question is how we can bundle all topics [ideas] and merge them into one structured [business model] development process" (P6). More specifically, these firms are lacking regarding generating new business ideas. Only a few had a "long list of ideas" (P5). Sources of ideas are mainly employee suggestions (e.g., through internal campaigns), supplemented by using cross-country or cross-industry approaches (e.g., Kamprath 2011). Analysis or evaluation as to whether generated ideas are useful and feasible is associated with high effort. Investigated firms undertake "cost/benefit analysis" (P5), 'development workshops" (P6), or "innovation evenings" (P3) to move ideas toward implementation. This process is rarely structured, is time intensive, and sometimes has no clear results. Furthermore, firms in mature industries have long-term product cycles and deliver their products years after idea development. This highlights the fact that firms with long development processes need to consider future trends early in the BM process (see also Day & Schoemaker 2005). Two firms explained they had only recently started managing the uncertainty of prospective changing customer needs. "The expectations of the customer are changing over time, so we need to understand in which situation our customer might be in future" (P8). In sum, practitioners from the interviewed firms were able to manage changes in their industry but lacked clear approaches regarding how to move from idea development toward implemented business solutions in terms of new BMs. They are faced with questions such as, "What does the overall transformation process look like?" (P6).

This data underpins the lack of understanding of how firms from mature industries can systematically tackle the management of BMI. This indicates the need for scholars to learn more about the processes for creating sustainable and sensible business models (also claimed by Schneider & Spieth 2013). Furthermore, these results offered a pathway for selecting an appropriate theoretical framework and conducting the main study. Thus, based on the chosen hybrid methodology approach (i.e., abduction), we took a first iteration step back into the theory and chose FMC as the appropriate theoretical framework. This choice helped answer the research question, generate insights, and create concrete results for participating firms.

5.2.Main findings, main study

Each phase of the FMC (i.e., exploration, evaluation, action plan) during the main study provided details and insights from analyzing interview data, learning from workshop recording and notes, and considering evaluation and feedback from workshop participants. The following sections briefly describe the phases and procedures within the action case studies and the findings from each phase.

5.2.1. Phase 1 - Exploration

The exploration phase was the initial step and was focused on functional thinking to create and identify new BM alternatives and redefine current business models (similar to Doz & Kosonen 2010). The starting point for exploration in the first workshop was teaching business model fundamentals and the concepts of demand (value created for customers) and potential (offerings based mainly on technology and knowledge) from a push-pull perspective. The articulation of the value proposition, which is a major BM role (Chesbrough 2010), describes the concept from a systems thinking point of view (Halecker & Hartmann 2013). This articulation was conducted by considering demand (i.e., customer need) and a firm's potential. New combinations of existing potential (i.e., technology, knowledge, resources, products, and services) and demand (i.e., customers, needs, and the market) allow the creation of innovation (Pfeiffer 1971) and thus a new potential value proposition. For the next step, we taught functional thinking using examples adapted to current business through abstraction of current potential and compatible demand. Abstraction allows the separation of

a technology or product from a certain context and goes beyond phenomenological description (Weiss 2004). Additionally, we identified new combination forms (i.e., value propositions) of demand and potential. After several iteration steps in which different customer groups were considered, between six and 14 concrete BM alternatives were created for each action case study and briefly described in a draft (i.e., conceptualization of principle constructions) along with value proposition, value creation, and value capture (i.e., profit logic((e.g., Zott *et al.* 2011).

Setting up a new exploration format (e.g., applying FMC for the action case studies) for seeking new business model alternatives was a fairly smooth procedure as this effort was met with huge interest from the participating firms. Their interest was mainly motivated by the pervasive pressure toward BM renewal (as described above). Firms have a pronounced need to reduce acting purely out of necessity and generating ideas by mere coincidence. One manager noted, "That is definitely a to-do on our list, to transfer [business model ideation] accurately into processes" (M13). Nevertheless, the studied firms demonstrated caution when exploring completely new business ideas and models that might cannibalize their current business logic. However, the data shows that idea generation in the form of exploration activities is easy to implement internally, as the associated effort is relatively low. "Only three workshop hours" (M14) were needed to explore a significant number of new BM ideas. Large firms have a wide variety of starting points for BMI (Bohnsack *et al.* 2014). In our studied firms, the initial starting points for exploration and thus BM consideration were mainly existing key markets and customer needs and followed the main question, "What drives the customer right now in their personal ecosystem?" (M16). The careful observation of customer behavior is often the beginning of a design process (Demil *et al.* 2015). Therefore, the functional abstraction of existing potential and demand in terms of customers' needs led to intensive discussion and quickly produced alternative needs that have not yet been met by the firms. This "open up effect" (Gassmann & Zeschky 2008, p. 103) resulted in between 10 and 18 new functional abstracted needs that differed from the phenomenological view (e.g., pharma = assurance; defense = security). Each need was matched with existing or new potentials (e.g., for defense, instead of radar, information systems). The procedure of functional abstraction is not entirely unknown in practice and

was thus easy to apply. One of the firms already used the method to find new application fields for their existing technology. Further methods for exploring new business model ideas are the "cross-industry approach" (M1, M18), "scenario analysis" (M8), and the Business Model Canvas (Osterwalder & Pigneur 2011) (M9). One firm used the "open space" format (Owen 1997) for collaboration with universities, vendors, associations, and its own employees (M14). Our experience from the workshops reveals that the main challenges in exploring new BM ideas are that customers often do not know their own needs and that practitioners are dominated by the logic (i.e., dominant logic) (Prahalad & Bettis 1986) and way the current BM works (see also Chesbrough 2010). A manager of one of the firms mentioned another challenge during exploration and stated, "We couldn't define our existing core competencies, which is critical when referring to renewal activities" (M15). These findings from the exploration phase, complemented by additional interview and secondary data material, led to our first propositions:

Proposition 1. The initial exploration of new BM alternatives is the simplest part of the BM renewal process in terms of internal acceptance and process and time effort.

Proposition 2. Exploration should begin with current demand (i.e., customer needs) and existing firm potential (i.e., know-how, technology) because of the challenge of customers' frequent unawareness of their own needs and firms' difficulty in defining their existing potential.

Proposition 3. Existing dominant industries, firms, or business logic can be break up during exploration using functional abstraction and the "open up" effect to create a solution space and help find new BM alternatives.

Our findings underpin that transferring the exploration phase of the FMC into the business model context is useful for generating new alternatives with an adequate ratio of effort and results. During the exploration phase, we generated several insights on our theoretical framework (i.e., FMC), mainly from workshop notes and evaluations:

- Functional abstraction is easy to understand and appropriate for rapid deployment in groups with differing backgrounds and experience.
- The creative step ("leap") from phenomenological thinking to functional abstract

thinking is challenging and requires suitable predefined examples.

- The definition of the "right" level of abstraction is critical; otherwise, the discussion can become too abstract and thus meaningless.
- Results (i.e., BM alternatives) need catchy titles to be memorable and thus enable further consideration.
- Questioning existing business models must be allowed (i.e., open space for possible cannibalization).
- Functional thinking is a useful approach for identifying new markets or application fields in the course of business development activities.

5.2.2. Phase 2 - Evaluation

The evaluation phase concentrates on ideas or alternative assessments based on a plausible future level of knowledge rather than the actual current level. For our cases, we used market attractiveness as an exogenous evaluation factor and resource strength as an endogenous evaluation factor (Pfeiffer *et al.* 1997) (Joyce & Winch 2005 and Sandström & Björk 2010 applied similar factors). Market attractiveness depicts economical suitability and dependency on demand, which means this factor is independent from the evaluated firm. The endogenous factor depicts how much resources the firm has compared to competitors and analyzes whether the firm will be able to successfully realize a BM alternative all the way to the market. The criteria used are human and organizational resources, know-how, financial resources, and available technologies. After evaluating the BM alternatives along these two factors, the current point of view (t_0) and the future point of view can be evaluated (t_1) with the help of scenario analysis. So far, scenarios have been mainly used only for the exploration of new BMs (Chanal & Caron-Fasan 2007), the development of BMI (Gnatzy & Moser 2012), or acquisition of new options for business development (Pateli & Giaglis 2005). In the FMC, scenario analysis creates a system of reference in terms of an evaluation object at (t_1) that goes beyond the current level of knowledge. All BM alternatives, (t_0) and (t_1), were consolidated into one comprehensive evaluation grid (see figure 20).

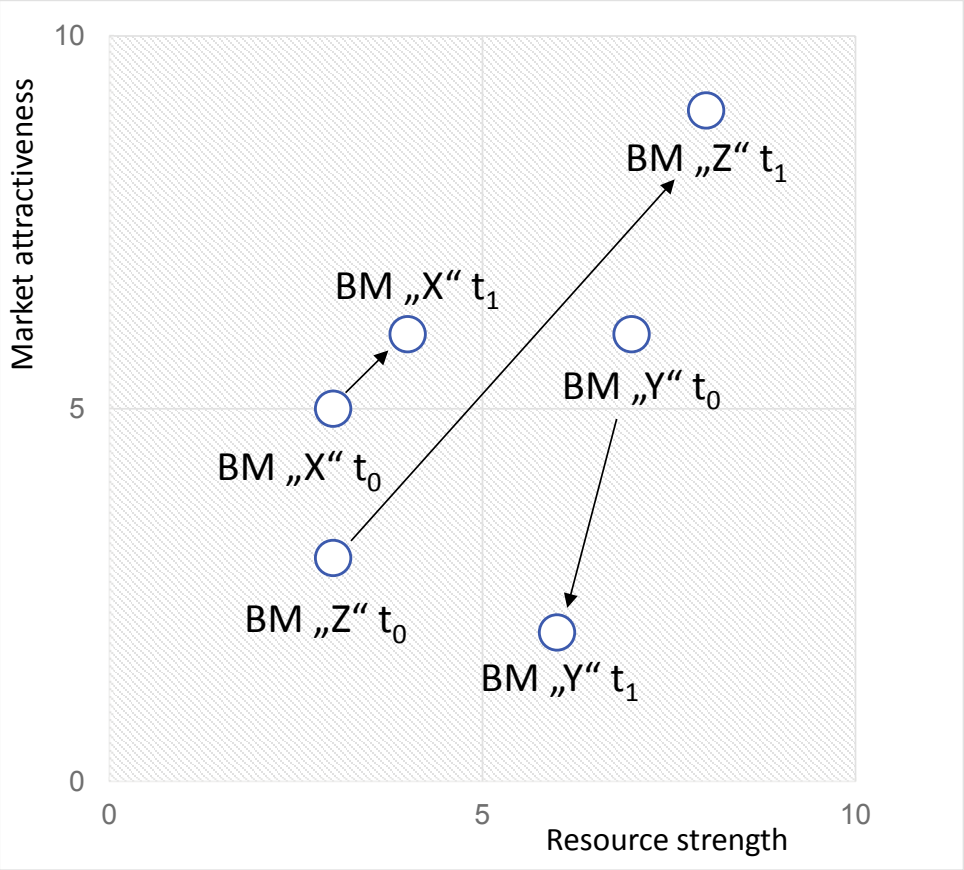

Figure 20: Evaluation grid as result of the evalutation phase (based on Pfeiffer & Dögl 1986)

The evaluation of BMI alternatives with reference systems promotes the comparison of future requirements with given alternatives. Using this method, common evaluation procedures focusing on the status quo can be suitably complemented. This part of detailed evaluation is lacking in most of the current BM literature (Kayaoglu 2013) and BM discussion (Schneider & Spieth 2013). Evaluation of BM ideas (i.e., inventions) or alternatives are an essential part of large innovation projects but is often neglected in practice (van der Panne *et al.* 2003). Accordingly, existing (innovation) management approaches are lagging behind new requirements for strategic innovation (i.e., BMI) (Sandström & Björk 2010).

After conducting our evaluation workshops and analyses of data, we were able to underpin the conception that incumbent firms have no consistent and structured approach for evaluation procedures with a focus on BM. One manager stated, ”[After ideation] the question is, how to evaluate ideas and which of them are worth transferring to the next stage” (M16). The range of (general) evaluation approaches and tools in studied firms is diverse. Our data show that these can be either strongly number driven (e.g., only business

case calculations or activity-based costing) or intuition driven and based on internal discussion with little structure. The favored approach used by the studied firms to evaluate alternatives was the use of foresight methods. Specifically, one firm preferred scenario analysis: "…we have thought about how the business model today and the business model in the future might be developed" (M14). By evaluating BM alternatives at points (t_0) and (t_1) and finally consolidating them into an evaluation grid (with the y-axis representing market attractiveness and the x-axis representing resource strength), we obtained substantial and transparent evaluation results. Differences between the (t_0) and (t_1) perspectives, driven by varied expectations of present and future developments, were of particular interest. One of the studied firms was aware of the portfolio view but without an understanding how to include the future perspective. In the end, evaluation was strongly affected by "existing personnel interests" (M17) as well as stakeholder sensitivities. One expert described how results from the evaluation phase should be in the form of "a harmonious business model concept with adequate future orientation" (M12). The evaluation step is generally reserved for large firms because "internal decision-making committees require robust and coherent concepts" (M16). Thus, before firms invest money in pilot projects or complete implementation, they want to ensure that new alternatives are worth investments of time and resources. During this stage of discussing piloting and experiments with participating firms, it became clear that the FMC does not reflect the potential of rapid market experiments with a simple prototype BM to collect early practical experience and produce further profound insights for later decision-making processes (e.g., the lean start-up principle). Evaluation of the findings led to the next three propositions:

Proposition 4. Adequate future evaluation is an essential part of the BMI process and is currently more driven by either numbers or intuition.

Proposition 5. Evaluating BM alternatives with the help of foresight methods (i.e., scenario analysis) is more useful for "pre-thinking" the future and creating systems of reference than using scenarios only for the identification of new BM alternatives.

Proposition 6. The evaluation phase have to include early, rapid experiments to correctly assess early market and customer feedback before beginning the transition into a pilot project or commencing overall implementation.

Our findings show that the FMC is appropriate for evaluating potential innovations (i.e., BM alternatives) that have been considered in time and space through future-oriented systems of reference. Furthermore, we found evidence that the FMC is lacking regarding early experimentation (i.e., discovery-driven approaches) (McGrath 2010). From a practitioner's perspective, regarding early experimentation is useful because "business models can be tested very quickly through simple prototypes such as internal presentations and customer surveys" (M11). Furthermore, firms can learn "what resources are necessary, what might be crucial for implementation, and if the potential BM alternative is really new" (M16). From a scientific perspective, there is evidence that experimentation with the elements of a new BM is more effective than the formal business planning process (Osiyevskyy *et al.* 2013). Considering these findings, we adapted the FMC regarding our experimental approach.

We added several more additional criteria and made slight adaptations for evaluating BM alternatives within the FMC:

- BM alternatives should be adequately described in a draft to ensure the common understanding of all participants.
- Each BM alternative contains a future perspective as the alternative does not yet exist.
- The existing BM must be considered and added to a firm's portfolio (e.g., BM old t_0 + BM old t_1 + BM new t_0 + BM new t_1).
- The time horizon for scenario analysis needs to have a long-term orientation or the difference between t_0 and t_1 is marginal.
- Future scenarios should be made tangible (e.g., "using an avatar to represent a future customer").

Finally, we found that the evaluation phase requires much more effort and attention than the exploration phase due to intensive scenario analysis, early experimentation through prototypes, and business case calculation, without which managers would be unable to make decisions.

5.2.3. Phase 3 - Action plan

After evaluating BM alternatives, the transfer from first concept draft to reality is necessary to adequately formulate strategic recommendations. This process is also known in the literature as the transition phase (Reuver *et al.* 2013) and defined as "opportunity exploitation" (Amit & Zott 2001, p. 511). After the evaluation phase, BM alternatives were transferred into a BM decision portfolio to determine which should be encouraged and which should be swiftly abandoned. For the selected BM alternatives, an action plan with an objective (structurally configured) and time-phased target and resource management is necessary. Given the fact that incumbent assets and managerial choices are simultaneously the main drivers as well as the main barriers for a new BM (Kim & Min 2015), it is crucial to determine what and when new capabilities (e.g., know-how, personnel resources, and money) are needed and establish the best timing to successfully implement new BM alternatives (also Doz & Kosonen 2010). Based on rapid experiment experience, it is advisable to begin a pilot project from the evaluation phase. Pilot projects can be adapted to users' value expectations and are not open to large markets so value capture is limited (Lehoux *et al.* 2014). The difference between an experimental and a pilot project is the use of different prototypes in each stage. A rapid experiment in the evaluation phase relies on either (1) a theoretical prototype (explanation through words), (2) a virtual prototype (initial sketch presented to customers), or (3) a minimum-feature prototype (simple physical version of the solution). The last prototype form (4) is the pilot project, or complete solution, which is relevant for the action-planning phase. This multilevel prototype view is in contrast to the statement, "business models often need to be fully implemented before they can be tested in reality" (Frankenberger *et al.* 2013, p. 263). Accordingly, before starting a pilot project, evaluation and experimental testing (prototypes 1–3) can increase success (van der Panne *et al.* 2003). The final result from the last phase of the action plan is a timeline for the pilot project and full implementation with adequate strategic recommendations.

The preparation and final transfer of BM alternative(s) into practice is "an enormous feat" (M13) because such projects "are different from normal internal projects" (M9). One of the main challenges in the studied firms is the availability of suitable resources, mainly personnel. Incumbents normally have "to work with already existing resource capacities"

(M5). As a result, the delegation of personnel to pilot projects who are sufficiently motivated to accept an increased workload is difficult. For implementation, or rather realization, of new BMs, managers face difficulties in terms of matching existing personnel capabilities and know-how with requirements for the new BM. In addition to resource issues, BM alternatives intended for implementation must be backed by existing strategy. Otherwise, "no resources to implement such innovative projects are available" (M7). A balance between firm targets and new BM alternatives is necessary and, in some cases, requires adoption of existing targets. One interview partner noted that "new BM can fail rapidly if targets and parameters are left as is and are simply transferred one to one" (M12). This highlights the fact that an action plan for objective and time-phased target and resource management is useful at this stage. In our action case studies, we found that firms are familiar with this type of action planning activity. However, managers pointed out that resource management (i.e., identifying when and what resources and capabilities are needed) is crucial and complex. Based on this, we derived the two final propositions:

Proposition 7. Action planning and subsequent implementation of BM alternatives differ from "normal" internal firm projects due to their extensive complexity and paradigm-shifting character.

Proposition 8. The core of action planning is a precisely planned, objective and time-phased target and resource management to ensure implementation success and prevent high internal resistance.

The findings from the action plan phase indicate that the target and resource management proposed in the FMC are essential for action planning for pilot projects and subsequent implementation of new BM alternatives. Objectively, this means deciding which BM alternative should be receive investment in and what know-how needs to be developed. The timetable determines when specific resources and know-how must be available and when the first activities for know-how development should begin. An appropriate action plan with clear strategic recommendations can reduce the frequently mentioned internal resistance (e.g., Frankenberger *et al.* 2013; Sosna *et al.* 2010) to a manageable size. The FMC has little to offer regarding organizational format for later implementation and scalability of new BMs. For decisions about appropriate formats, we used the approach of O'Reilly and Tushmann

(2008) in which operational leverage and strategic importance are combined into a decision matrix (O'Reilly & Tushman 2008) that is helpful for identifying which projects could be potential spin-offs (an additional approach is that of Osiyevskyy & Dewald 2015). For business model scalability, Stampfl *et al.* (2013) suggested an explorative model that provides support for later BM growth (Stampfl *et al.* 2013).

After the action-planning phase based on FMC, a number of further insights were revealed:

- The BM decision portfolio has strong validity due to practical evaluation criteria, market attractiveness, and resource strength and supports long-range management decisions.
- Working with action plans (i.e., project plans) initially seems to be common practice for incumbents due to their daily project business but is more complex on closer examination.
- Time constraints are an issue as managers have problems finding sufficient time for realizing innovative projects and taking responsibility for planned actions.

The data and findings provide evidence that after slight adaptations, the FMC is an appropriate concept for the studied firms in mature industries to renew their mostly declining BMs. Table 10 provides a complete overview of the proposed concept for managing BMI in mature industries based on the adapted FMC.

Table 10 Concept for managing business model innovation based on adapted FMC

	Exploration	Evaluation	Action Plan
Function	Extending common phenomenological thinking (descriptive definition of product characteristics) by functional (abstract) thinking to create new BM alternatives	Enabling the selection of business model alternatives, particularly those that are most suitable for the future instead of exact determination of current status	Promoting a targeted and logical (investment) decision in time by objectively and timely phased target and resource management as well as strategic recommendations
Main (guiding) question	What is the current "fit" between the value proposition and customer/market needs and what are the new alternatives?	Which BM alternatives fulfil current and, above all, future market/ customer requirements?	What do we need when/ if investing in a specific BM alternative and how must we change our current BM?
Required resources	(Creative) workshop team and moderator; guidelines (e.g., geographical locus)	Team, moderator, or external expert(s); scenario approach (software), experimental skills, and additional analysis capacity	(Independent) implementation-oriented team; (CxO) sponsor, pilot (experimental), and project management skills
Process and time effort	Low	Moderate/ high	Moderate/ high
Result/ outcome	New BM alternatives (inventions) briefly described as a draft	Evaluation grid with all BM alternatives at	Action plan (timeline) with adequate strategic

	that outlines value potential and customer need (demand)	t_0 (present time) and t_1 (future) and first findings from early experimentation	recommendations for pilot project and implementation
Resistance/ difficulties	Low	Low/ moderate	High
Selected activities to reduce difficulties	Find a team of diverse and motivated people to help carry out new ideas and lead management	Verify evaluation executed on the strategic level with operational units based on their feasibility estimation and close market relationship	Find an appropriate area for piloting and be adequately sensitized toward "cannibalization" and personnel (stakeholder) sensitivities

In summary, our research presents interesting and practical examples for BM renewal in firms from mature industries and proposes ways these firms can manage BM activities systematically and in a methodologically correct manner. These findings lead to insights "that help managers understand themselves and their organizations better" (Markides 2007, p. 765).

6. Discussion and conclusion

Our study addresses the following question: How can incumbent firms from mature industries systematically tackle the management of BMI? By adapting the system-oriented FMC to three abduction-oriented action case studies in mature industries, we sensitized and helped firms think outside the box and proposed a concept for managing BMI. By transferring theory into practice, we generated novel insights to better understand and explain BMI in applied settings. With our findings and numerous deduced theoretical propositions for further research, we responded to calls from scholars for further theory

development on the phenomenon of BMI as well as the related mechanisms (e.g., Dmitriev *et al.* 2014; Zott *et al.* 2011).

Over the course of the study, it became clear that firms in mature industries had already tested quite a few methods to renew their BM but that this did not extend beyond the phase of ideation in most cases. In our study, we went beyond most existing research studies. More precisely, we used methods such as functional abstraction, which led to new concrete BM alternatives in an empirical setting. We subjected these newly generated BM alternatives to an additional future-oriented evaluation to ensure early forward-looking identification of innovation of a radical character. Afterwards, relevant BM alternatives were transferred into an encompassing action plan to encourage their transition into practice. Nevertheless, the conducted action case studies were simplified and shortened to some extent to meet strict time constraints set by the participating firms. As a result, it was evident that new BM alternatives are quite easy to explore within a single workshop. The next two steps, evaluation and action planning, are much more process- and resource-intensive, which makes them difficult to manage in appropriate depth in a workshop. As we have shown, but not studied longitudinally, the main difficulty or resistance regarding BMI pertains to action planning and implementation due to the typical rigidity of established core BMs and their dominating logic (Chesbrough & Rosenbloom 2002; Chesbrough 2010; Prahalad & Bettis 1986). Teece (2010) emphasized that "changing the firm's business model literally involves changing the paradigm by which it goes to market" (p. 187). Our results provide evidence that it is helpful and essential to have an appropriate concept for the holistic and structured management of BMI in place to prevent inertia. When considering these parameters, it should be acknowledged that the transition from evaluation and action planning is fluid rather than consisting exclusively of discrete steps. Therefore, our proposed concept for managing BMI is more of a guideline than a rigid process manual. This is inevitable, as BMI practice does not follow strict procedures (Stampfl *et al.* 2013, p. 233). In almost all mature industries, it is essential to renew existing BMs and change paradigms because almost all mature industries are dramatically changing and the current (old) BMs no longer work. While adopting, practicing, and slightly adapting the FMC, we determined that these firms can manage their BMI activities in a competitive manner. Finally, we supplied insights that

can create better understanding of the complex BMI process as well as the phenomenon of BMI itself.

In contrast to several existing conceptual frameworks, which were derived solely from the literature, our proposed concept is derived from both knowledge of the literature and experience from the field. This approach to developing a concept based on both theory and practice has been successfully applied in several disciplines, including marketing (Storbacka 2011) and manufacturing (Storm *et al.* 2013). It is apparent that extensive interaction with practitioners (i.e., respondents) is reasonable and helpful for addressing the research gap around BMI as a process (Schneider & Spieth 2013), In such situations, a hybrid methodology (abduction) and research strategy with qualitative methods and aspects of action research are appropriate. Using these allowed us to investigate the "mental model" and experience of practitioners. Additionally, we demonstrated that the adaptation of existing concepts from other disciplines (in our case, the FMC) to the relatively new phenomenon of BMI is useful. As our case shows, this delivers new and interesting data and insights supported by a profound theoretical background. To study innovation as a process, which is an underdeveloped topic in the literature (Crossan & Apaydin 2010), we highly recommended this approach. Future research projects focusing on BMI as a process in incumbent firms should consider findings from the broad organizational innovation literature (e.g., Fiol 1996) as many phenomena in this discipline are structurally similar to BMI. A wide literary scope will provide a rich base for developing a comprehensive understanding of BM renewal and innovation.

In terms of success, our work makes four theoretical contributions and one methodological contribution and provides a series of managerial implications. First, by applying a theoretical framework in a practical setting, we promote understanding of BMI in mature industries and help reveal its "core". Second, our study shows that the transfer of the FMC, which was originally used for technology planning, into the BMI context is possible and useful with slight adaptations. Third, we contribute to existing literature by proposing a concept that focuses on exploration, evaluation, and action planning of BM alternatives. More specifically, we provide relevant and novel insights into how future-oriented evaluation with a defined reference systems works in detail. This area has been neglected in previous research and is a

key domain within BMI as, ultimately, an idea is only as good as its adequate evaluation. Fourth, we show that innovating BMs and thus renewing existing BMs is a complex and challenging managerial task. The level of difficulty and complexity increases throughout the process (from exploration to implementation).

Using a relatively new research approach in terms of methodology (abduction) and research strategy (action case study), we demonstrate how to successfully apply these set-ups in research and practice. From our overall research experience, we believe that this kind of action participation is ideal for studying complex BMI projects. Furthermore, it enables the simultaneous application and examination of existing theories and frameworks. Our study is one of the first to use this strategy and hereby offers an interesting, new, and, first and foremost, tested way of practically applying innovation research (Sørensen *et al.* 2010). Furthermore, there is evidence to suggest that engaged scholars have an increased interest in such actions and interventions (van de Ven 2007). The usefulness of gathering research results in cooperation with actual practice is of increasing importance for management scholars (Sandberg & Tsoukas 2011).

In addition to contributing to the academic literature, our study reveals implications for management practice by helping firms in mature industries with declining BMs assess and manage their BM renewal toward innovative BMs. The proposed concept provides appropriate guidance for practitioners to tackle the management of BMI in a systematic manner. Practitioners frequently complain that published research lacks practical relevance and does not meet their needs. With our study, we offer a new way of close cooperation between academia and practice without pushing such research in the direction of "academic consulting".

As a closing remark, we recognize several limitations of our action-based, qualitative data collection approach. We employed a small sample (three action case studies), and the results were not subjected to statistical analysis, meaning there are no significant grounds upon which to assert representativeness. We are aware that qualitative interviews carry the risk of misrepresenting the associated findings. Using a combination of workshops alongside the consideration of additional material, we aimed for a fairly secure triangulation of perspectives and thus increased the validity of the qualitative research (Miles & Huberman

1994). Nevertheless, our attempt to use a relatively new methodology (abduction) and a mostly unknown research strategy (action case study) for the first time posed some difficulties in execution (workshops and interviews), data analysis, and interpretation.

7. References

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SYNTHESIS

1. Main results, contributions, and conclusions

The overall goal of this dissertation is to create a new perspective and insights on business model innovation (BMI) using systems thinking (ST) and an action case study (ACS) approach. Taking a systemic view of business models (BMs) and BMI and applying the ACS approach in incumbent firms from mature industries facilitated new insights and a better understanding of BMI. The literature on BM and BMI has abundantly referenced the need to mitigate the knowledge gap regarding in-depth understanding of BMI mechanisms in firms as well as support incumbents with appropriate (management) concepts (Bock *et al.* 2012; Dmitriev *et al.* 2014; Kim & Min 2015). The emerging conceptual and empirical literature on BM and BMI has called for clear guidelines concerning the best research design to fulfil academic requirements. Thus, it is both necessary and promising to conduct modern research on the "fuzzy" BM concept and the "slippery" BMI construct (Casadesus-Masanell & Zhu 2013) in order to strengthen theoretical grounding (Teece 2010) and provide structure and insights regarding growing research activities, as evidenced by the increasing number of publications (Wirtz *et al.* 2015).

The key results of the dissertation are threefold and contribute to expectations regarding originality and significance (Lovitts & Wert 2009). The results are first, a theoretical conceptual result (i.e., a new perspective on BM and BMI); second, a methodological result based on a novel and proven research strategy (i.e., ACS) for innovation (management) research; and third, empirical results based on new insights and propositions that promote a better understanding of BMI. Each key result makes clear contributions to the existing literature and several related conclusions are drawn in a stepwise manner.

1.1. New perspective on BM and BMI

The discussion of the BM concept and BMI from an ST point of view relates to the first research question of the dissertation "How can the BM concept be described from a ST point of view and how does this view contribute to BM and BMI research?". By taking a ST view

on the BM concept (article I) and BMI (article II), the emerging research field benefits from greater clarity (through a semiotic lens and model theory) and structure (through applying the four systems dimensions). Several attempts have been made in academia to organize the different views and definitions of the BM concept as well as suggest new dimensions and types of BMs, but these have failed to reach the core of the concept (Zott *et al.* 2011; Wirtz *et al.* 2015). The literature-based work of this thesis (mainly articles I and II) deals with the variety of existing definitions, views, and perspectives of the BM concept in a systematic way and contributes to current research with a holistic, integrated, interdisciplinary, and hence new (systemic) perspective on the BM and BMI. During the systematic (re)view of the literature on the BM concept (article I), several uncertainties and structural shortcomings appeared and were used to determine directions for further research. Along with the systems dimensions of function, structure, process, and governance, article I captures the "fuzzy" concept of BM and enlarges the view from "what is a BM" (DaSilva & Trkman 2013) to "what does a BM do and what does it fulfil" (Doganova & Eyquem-Renault 2009). Additionally, when examining the BM concept through the systems dimensions, it was apparent that the current debate is focused more on the system dimensions of function and structure than process and governance. This confirms the statement that BMs and research of the BM are static rather than dynamic (Demil & Lecocq 2010). Inspired by the usefulness of ST and informed by the research gaps and shortcomings of the existing literature, article II discusses in more detail the idea of merging ST with BMs and BMI. The article is one of the first to complete a detailed review of the comprehensive ST literature (i.e., systems theory literature) from business and innovation perspectives and provides a brief overview of ST approaches (see table 4). After selecting a concrete ST approach (Pfeiffer's approach) a four-dimension, system-oriented framework was proposed to structure BMI and provide a clear agenda for BMI activities. This agenda serves as the first holistic view of the topic and orients firms and researchers as to where to begin and what dimensions to consider for BMI. Specifically, the framework demonstrates that the best starting point for radical BMI is rethinking the function of the BM (i.e., value proposition). At this point, cross-fertilization between the two fields (BM/BMI and ST) was feasible and facilitated by profound arguments regarding the promise of applying ST in BM and BMI research. The findings and results respond to several calls in the literature for more clarity and structure regarding the BM

concept (Casadesus-Masanell & Zhu 2013; Demil *et al.* 2015; Zott *et al.* 2011) and the BMI process (e.g., (Dmitriev *et al.* 2014; Schneider & Spieth 2013; Spieth *et al.* 2014).

The following conclusions can be drawn (mainly from articles I and II) regarding ST in BMs and BMI:

- ST provides a clear mental and activity framework (considering all elements, interdependencies, and perspectives) to structure and systematize a (thus far) the "fuzzy" BM concept and "slippery" construct of BMI
- ST helps managers and researcher consider a system (i.e., the firm or organization) as a whole and provides guidance for complex BMI activities
- The BM concept (including thinking about BMs) has many similarities with ST and represents a potential new application of ST

The exploration of ST in the first part of the dissertation creates a profound starting point and establishes a point of scientific origin for the course of the project. ST aspects are further considered and an appropriate research set-up in accordance with ST (article IV) is identified. Furthermore, the concept (FMC) applied in the empirical section (article V) strongly references ST.

1.2. Novel and proven research strategy for innovation (management) research

The second question of the dissertation "What is current research practice in BM and BMI, and what is an appropriate methodology and research design for studying BMI?" refers to current research practice in BM and BMI and an appropriate research set-up for studying BMI. By identifying and analyzing the most commonly employed methodologies and research designs within the emerging field of BM and BMI research, article III answers the first part of the research question. The review reveals that common research practice is diverse and does not fully comply with the requirements of top academic journals (Alvesson & Sandberg 2011; Pratt 2009; van de Ven 2007). Common research practice can be seen as the dominant practice rather than the best practice. As a result, the review focuses more on creating a structured overview of BM and BMI studies and examining assumptions (e.g., case

studies are the dominant research strategy) than producing fundamental breakthroughs about best practices. Nonetheless, the argument is clearly made for the need for better research on BM and BMI in terms of accuracy, transparency, and practical orientation. To meet the requirements of top academic journals in terms of rigor, relevance, and "ah-ha" moments (van Maanen *et al.* 2007) and close the widespread theory-practice gap in terms of making the goal of research to solve practical problems (Sandberg & Tsoukas 2011), new methodology (Polsa 2013) and research methods (Sørensen *et al.* 2010) are necessary. The proposed novel research strategy—the ACS—combined with abductive methodology (article IV) answers this call and constitutes an appropriate research set-up for this thesis. After arguing for the strength of ACS combined with abduction methodology in a purely conceptual manner, application in a real-world research setting is the next logical step. This application of this approach in article V demonstrates that abduction and ACS are a serious combination and provides the first "proof of concept" for ACS as a novel research strategy. However, ACS represents a new and unknown way to conduct research, which could lead to difficulties regarding acceptance within the research community (i.e., by reviewers). Nevertheless, the results (overview of current research practice and novel research strategy) contribute to innovation research practice (Sørensen *et al.* 2010) and the general discussion on research requirements (Alvesson & Sandberg 2011; Pratt 2009) and address the questions of how to study BMI as a "slippery construct" (Casadesus-Masanell & Zhu 2013) and temporarily interact with the object of study (Ottosson 2003). The result also contributes to ST research, which is generally associated with action-research activities (Checkland 1981) as ACS and action research have a clear relationship with ST (Flood 2010).

From reviewing current research practice, proposing a novel research strategy, and implementing this research strategy in combination with abduction in a real-word study, the following conclusions can be drawn:

- A transparent and structured overview of current research practice encourages understanding and sensitivity about the accuracy of methodology within an emerging research field.
- Greater synchronization of the expectations of researchers and practitioners regarding research results is possible with the application of ACS instead of

conducting research from the outside looking in (e.g., with questionnaires).

- The combination of ACS and abduction and its interactive aspects represents research in action rather than research about action.

1.3. New insights to promote better understanding of BMI

The third research question, "How can incumbent firms from mature industries systematically tackle BMI?" is addressed by combining ACS with abductive methodology (article IV) and conducting three action case studies in firms from mature industries. The study outlined in article V (including the pre-study and main study) reveals new insights and knowledge about how BMI occurs in practice (i.e., by uncovering triggers and challenges and making propositions). These insights are derived by conducting research as close as possible to the unit of analysis (i.e., the BMI process in the context of a real firm) with an appropriate level of analysis (i.e., selected firms from mature industries). These findings contribute to a better explanation and understanding of the BMI process (Bock *et al.* 2012; Demil *et al.* 2015; Dmitriev *et al.* 2014; Kim & Min 2015; Schneider *et al.* 2013). Furthermore, the article addresses gaps in the literature, which include the exploration of BM from a process point of view (Baden-Fuller & Mangematin 2015). The deduced propositions also promote insights for a better grasp of the core of BMI (Spieth *et al.* 2014). As current BMI processes are mainly focused on ideation, the proposed concept (based on the FMC) involves a systematic and holistic BMI management approach that includes exploration, evaluation, and action planning and supplements the literature in this area (e.g., Bucherer *et al.* 2012; Frankenberger *et al.* 2013). The application of the FMC serves as concrete guidelines for BMI (from idea to action, or transition) and helps firms from mature industries renew their BMs. This concept (i.e., guideline) goes far beyond the initial framework based on the four-dimension system outlined in article II. However, both are strongly ST-driven and enable a holistic and structured way of thinking and acting regarding BMI. Furthermore, the proposed concept encourages a more dynamic view of the BM (Casadesus-Masanell & Ricart 2010; Demil & Lecocq 2010) and demonstrates how it is a useful instrument for practitioners. The results of the study in article V demonstrate that the novel proposed research strategy of ACS combined with abduction (article IV) reinforces the "problematization" trend in research (Alvesson & Sandberg 2011) and enables real-time study (Pettigrew 1990).

Reflecting on the results and contributions from the empirical study, three conclusions can be drawn:

- Novel research strategies (i.e., ACS), including iterative revision cycles between theory and practice, are promising and can mitigate the existing practice-theory gap.
- The BMI process begins relatively easy (with exploration) and becomes more difficult and complex. Evaluation and action planning i.e. implementation must become more agile, fast, and radical, especially in firms from mature industries.
- Adaptation of existing concepts from other disciplines (in this case, FMC) to the relatively new research field of BMI is useful and provides new insights.

The results lead to clear contributions and stepwise conclusions. In the next chapter, several theoretical and practical implications are made and a critical reflection regarding limitations of the study is provided.

2. Implications

2.1. Theoretical implications

Although the literature is on the way to being consolidated, the results of the dissertation indicate that the BM concept does not yet have clear theoretical roots or a solid foundation, as partly stated by Amit and Zott (2015). As a main implication of this thesis, ST, with its similarities to BM and it universal nature (e.g., Luhmann 1973), provides a precise approach to strengthening existing attempts at theoretical anchoring and building a solid foundation. Moreover, researchers can gain clarity about the BM concept by considering model theory in more detail (Schwaninger 2004; Stachowiak 1973). This creates a solid point of reference for combining the latest research findings with profound theory. Furthermore, taking a semiotic view provides a better understanding, especially for researching new phenomena, and represents an appropriate starting point for any new research project or activity. Another implication is that the adoption of existing concepts or frameworks from other disciplines provide “fuzzy” research objects (i.e., phenomena or topics) a concrete structure and promote better understanding. This thesis takes a new view on a fuzzy object (i.e., the BM

concept), which allows new perspectives, insights, gaps, and shortcomings to surface. Aversa *et al.* recently used this idea of adapting an existing approach (i.e., theory) to the BM concept. They "borrowed" the modularity and manipulation approach from the theory of complex systems to answer their research question and deduced several new and interesting findings (Aversa *et al.* 2015b). The general implication is that it is helpful at the outset of research to think holistically and systematically to create insights and then commence empirical research. It should be clear that is true for all research projects and cannot be repeated enough. The dramatic changes in industries caused by digitization and disruptive technologies and business environments have forced scholars to become forward thinkers and explain these dramatic shifts and their impacts on existing BMs. This leads to the implication that, especially in times of disruptive innovation and thus the rapid emergence of new phenomena, scholars in this field benefit from the application of ST for grasping the core of the "new thing" (for a further innovation examples, see Galanakis 2006). Additionally, studies from other fields have underpinned that the application of ST is useful (e.g., in corporate strategy Weil 2007 and strategic management Warren 2005).

Implications from the analysis of current research practice in BM and BMI indicate it is time to rethink existing research engagement and move towards a more open-minded culture that includes new research alternatives such as abduction and ACS. Furthermore, many other interesting methodological approaches are waiting to be discovered (Polsa 2013). Research, in this case on the BM or BMI, should be conducted more systematically and research projects should be structured (i.e., with the help of the research onion) from the outside (i.e., philosophy) to the core (i.e., data collection and data analysis methods) to conduct appropriate and transparent research. At the least, accuracy and the appropriateness of research for communication (i.e., for publication) should be considered in a systematic way. Another implication is that it is helpful during research and in later communications to clearly state the *unit of analysis* and the *level of analysis* (as in some newer articles such as Baden-Fuller & Mangematin 2015). While this is difficult, it will increase the clarity of research and findings and result in better comparability with other research results.

The propositions from the empirical article provide new insights into and explanations of BMI in firms from mature industries. Researchers should empirically test these propositions to further develop theory with a specific focus on mature industries. Each proposition

represents an under researched area and thus an interesting field for deeper analysis. For example, the first proposition is interesting as it raises the question, "Is the exploration of new BM alternatives the simplest part of the overall renewal process?". With more data from other firms, aspects such as prerequisites, timing aspects, and overall conditions can be examined to create a clear picture about the true level of difficulty in the exploration phase. A general implication from the propositions is that research should clearly indicate whether specific aspects of BM and BMI work. This will increase the level of detail in results and findings. For example, proposition four states that an adequately future-oriented evaluation is an essential part of BMI. In this case, it would be interesting to examine why future-oriented evaluation is more effective than, for example, evaluation based only on current data or why future-oriented evaluation is generally useful in this context. Asking "why questions" advances research results and creates more relevance for academic purposes rather than simply asking "what questions", which are more relevant for the benefit of clients (Easterby-Smith *et al.* 2002). However, the "client" (i.e., the cooperating firm or interviewed manager) must be satisfied to ensure access to real and novel data. Without new high-value data from firms and organizations, no relevant research can be independently conducted. Novel, interesting data support the generation of the often-mentioned "ah-ha" effect, which has implications for scholars and participating practitioners. By reaching a balance between these criteria, the future of BM and BMI research can be secured.

The results, especially those from the empirical study, show that firms are not completely inactive regarding BM renewal topics. In several cases, firms do not yet call such a process BMI because they are unfamiliar with this (to them) novel phenomenon. The implication for scholars is that within their research, they must clearly state whether all process steps of BMI are necessary and how existing mechanisms in a firm can be combined with proposed concepts. Again, this will lead to deeper insights for academia and firms will not be overstrained during BMI.

Finally, the implication from the proposed categories of BM research streams (Table 1) is that each study or research project should clearly state which research stream is being followed in order to indicate the adopted perspective and contribute to a specific stream. This will make the nature of research clear and enhance overall development of the BM topic.

2.2.Practical implications

Since ST was initially developed in the mid-20th century (Bertalanffy 1956), it has been closely oriented with practical (social) phenomena. Unlike thinking about systems (e.g., accounting systems or healthcare systems) (Jackson 1991) ST has failed to achieve great fame outside its specific application areas, particularly management. However, it has become obvious that managers can benefit from the ST skill set (see e.g., Cavaleri & Sterman 1997; Maani & Maharaj 2004), especially when handling complex tasks such as BMI, with its myriad of interconnections between elements during decision making (choices) and their consequences (Casadesus-Masanell & Ricart 2010). An important managerial implication is that learning to think in systems and consider interdependencies will help managers handle different levels of problems and produce appropriate solutions. The four-dimension system (function, structure, process, and governance) is a good framework for analyzing and structuring fuzzy or complex business topics (e.g., strategy or campaigns). The framework proposed in article II provides managers with a holistic view on BMI. This framework help them better understand the dimensions that should be considered and implies that fundamental (i.e., radical) BMI originates mainly from rethinking the function (i.e., value proposition) of a BM as the first step. Considering current challenges, which, to some degree, have triggered dramatic shifts in several industries, a promising way to respond to these is with the renewal of existing BMs and, if possible, innovation of firms' own disruptive BMs. This is difficult to tackle, especially in mature industries. However, after understanding guidelines on BMI, managers need to identify what approaches are available to renew or manage BMI and which approach is applicable in their specific case. It is recommended that firms look for new practices (e.g., from academia) instead of best practices (e.g., benchmarking studies). The concept proposed in this thesis (i.e., FMC) offers guidance and considers the major phases of BMI (exploration, evaluation, and action planning). These overall phases are required to manage BMI in a systematic manner. The proposed concept also has implications for other industries and is applicable for all firms dealing with BM renewal and related activities. Adopting this or similar concepts in early experiments (i.e., prototypes) during the creation of a new BM is necessary to get immediate customer feedback and ensure early and short revision cycles. The biggest challenge for incumbent

firms, especially those from mature industries, is conducting BMI in as agile a way as possible. To capture new opportunities, managers must prioritize agility instead of dismissing it as too difficult or too expensive or avoid being defensive and relying on the wait-and-see approach. Combining agility with ST does not require expensive capital investment. The basic "lean" skills of continuous improvement combined with experiments and ST ensure effective action and a quick response to disruptions. In this way, incumbents can answer current emerging challenges with innovative and (in the best case, their own) disruptive BMs. Nevertheless, incumbent firms will not survive by radically replacing an old BM with a new BM only; they must also leverage and renew their existing capabilities and resources in a new and changing environment. Finally, it is important for (top) management to encourage and supervise BMI as a strategic activity as only they have the authority to drive the overall renewal progress towards transition. They must understand that the age of the customer has already begun and that the business model enables firms to provide value to customers and capture profit from this transaction.

The rise of modern and proven research set-ups has implications for practitioners, namely, that collaborating with researchers delivers concrete value. Concrete benefits in an action-based research project include new stimuli in terms of academic findings and outside-the-box concepts. In the best case, practical problems are solved. Despite these benefits, practitioners should not expect "academic consulting" as collecting data and deriving new knowledge are the main purposes of this type of research collaboration.

3. Critical reflection

This dissertation has several limitations in addition to those already described in the articles. The dissertation shows that the BM is an important concept but also demonstrates that BM is still a fuzzy term and the BMI discussion is diverse. For example, discussion on the BMI concept includes both results in terms of innovative BM and the promise of results (i.e., missing proof of concept), which is an invention more than an innovation. Thereby, it is possible that some of the results of the dissertation have been misinterpreted due to the variety of definitions, views, perspectives, and schools of thought. Furthermore, it was impossible to summarize all of the discussed views, perspectives, and approaches into a

single holistic picture (especially in article I). The derived three research stream (Table 1) is a first attempt on a meta level. All articles represent stand-alone studies and have a distinct story line. However, the content overlaps in some cases, particularly in components of the first two and the last two articles. One reason for this is that these articles were largely developed in parallel. While the development of insights was on similar levels, each article had a different focus. Furthermore, an evolution of ideas can be observed in the articles because they were completed over an approximately four-year research period.

The investigation of ST in the fields of BM and BMI is mainly conceptual with little empirical evidence regarding proof of value added. Furthermore, the article II briefly discuss the reasons for selecting Pfeiffer's approach for the empirical research, but the choice was made primarily due to the authors' personal opinions. However, other suitable approaches and concepts are available. The ST literature review is not fully comprehensive because the field is far more complex and has a much larger body of literature than what can be feasibly addressed in a single dissertation project.[82] For the qualitative study that comprises the empirical part of the dissertation, the sample size is quite small, with three action case studies and a total of 27 interviews. Therefore, the findings cannot be easily generalized or transferred to the majority of incumbents from mature or other industries. The ACS research observed the same phenomena (the business model process) three times without providing concrete answers about sequences or the completeness of the presented "shopping list" (i.e., guidelines for managing BMI).

Other limitations relate to the chosen research set-up. The attempt to use a novel research strategy implies some difficulties in execution due to a lack of research projects for reference. Nevertheless, the conducted ACSs did not lead to the precise identification of broad functionality and thus do not fully rule out the possibility that the proposed concept would allow incumbent firms to succeed in BMI. Future studies should more comprehensively test the long-term success and complex relationships among concept elements. Finally, in retrospective, the research questions could have been more specific, especially the third sub-

[82] Several books and encyclopaedias address the broad dimension of systems thinking, systems theory, and systems (including cybernetics) with a myriad of approaches and methods. For an overview, see Cabrera (2006).

question. This lack of specificity could result in (easy) agreement within the research community on the findings but a lack of full acceptance of the results as stand-alone, real-world insights.

4. Outlook and future research pathways

The dynamic of market developments and changes driven by global trends, disruptive technologies, and new entrants will not decline in the future. In contrast, it will dramatically increase and incumbent firms in established and expanding mature industries will face pressure to find appropriate ways to respond to such changes. Large incumbents will not completely disappear, but they will have to fight against a myriad of smart and creative start-ups as well as entrepreneurs around the globe. There will be much more of everything—more innovation in more locations from more individuals focusing on more details and more niche markets. The industrial economy will be reinvented and finding the appropriate answers regarding innovation will become more essential than ever. The capability to innovate is one of the most important determinants of firm performance and success (Crossan & Apaydin 2010) and will remain so in the future.

One of the main drivers of change is digitization, which means that from a technology perspective, more and more objects are assigned their own IP address and linked via the Internet and global networking infrastructure. Accordingly, a huge number of objects are becoming "cyberized" and thus "smart" (Hartmann & Halecker 2015). With the dramatically increasing numbers of such cyber-physical systems (CPS), more atoms are being transferred to bits and massively pervading the business world.[83] In addition, the emergence of new disruptive technologies in areas such as artificial intelligence, robotics, sensors, and virtual reality is accelerating the pace of innovation. Technologies are becoming more powerful and reshaping customer experiences, business operations, and, in the end, BMs. The pace and impact of these technology innovations are amazing but are just a preview of what is

[83] Some years ago, Marc Andreessen opined that "software is eating the world". It seems this will become increasingly true in the near future.

coming. Considering Moore's law[84], technology will be about ten times as powerful in five years as it is today and for the same price. In ten years, it may be a hundredfold more powerful, indicating that keeping pace with innovative technology will be even more difficult in the future.

Accordingly, one of the essential technological as well as managerial capabilities in coming years will be building and deploying digital platforms as new digital BMs. These platforms are gaining in strategic importance and represent the renewal of the customer interface and the aim of dominating it. Research findings show that incumbent firms must first learn how to build and organize digital platforms (i.e., digital BMs) (Yoo *et al.* 2012). Digital BMs require specific infrastructure (e.g., mobile networks and cloud computing) as well as new digital knowledge, which take a long time to build and require careful coordination of standards (Yoo *et al.* 2012).[85] There is no doubt that these innovations and technology developments affect the BMs of incumbents in a dramatic manner. In particular, the technology will shift the balance of power from large incumbents to small businesses and start-ups. However, in some industries, especially mature industries, doubt exists about whether sufficient attention is being paid to the urgency of such digital transformation. All these developments will increase the pressure on and expectations of innovation management in threatened firms. Innovation must become continuous, relentless, and fast (Yoo *et al.* 2012). This is particularly true regarding capability to renew and innovate BMs.

Within the described digital developments, there are several opportunities and benefits for incumbent firms. First, new BMs can be created, designed, and evaluated by the "crowd", which means other entities besides R&D departments or innovation labs can create new BMs. This scenario, in which the creative process is "outsourced" to special groups or initiatives (for more see details, see Abrahamson *et al.* 2013), can revive the open innovation approach (Chesbrough 2003). Similarly, a BM, especially a digital BM, can be rated quickly

[84] In 1965, Gordon Moore (co-founder of Intel) made a prediction that would set the pace of the modern digital revolution. Moore extrapolated that computing dramatically increases power and decreases relative cost at an exponential pace. Moore's law became the golden rule of the electronic industry (for more details, see http://www.intel.com/content/www/us/en/silicon-innovations/moores-law-technology.html).

[85] This fact is also addressed in article V in the discussion about action plans and is partly covered in proposition 8.

and evaluated by customers and users after its first application. There are a myriad of new online and digital feedback channels (e.g., user labs, social media discussion, and evaluation through rating portals) that can help decrease the risk of failure for innovation with a radical character. [86] In the past, firms have tended to overrate the innovation potential of a product, service, or BM, whereby customers underrate the innovation potential (Gourville 2005). Second, the success or failure of an online BM can be measured more directly and accurately (e.g., conversion rate and click-through-rate). Creative start-up firms have progressed much more rapidly regarding adopting data-driven BM measurement and evaluation processes than incumbents. They test ideas quickly in the market and produce BMs regardless of incumbents and without fear of failure. Third, excellent opportunities for incumbents arise when considering the different categories of adopters (i.e., potential customers). Considering these categories (i.e., innovators, early adopters, early majority, late majority, and laggards) (Rogers 1995), start-ups are often successful in the early phases of innovation acceptance. Later, when market dominance is relevant for expanding market share, incumbents are back in the game. Therefore, there is opportunity in understanding all the categories and increasing capability in the early phase or in collaborating with start-ups. Fourth, by using the huge amount of data available (big data), firms have the opportunity for early identification of new technology trends, start-ups (ideas), and customer needs that represent either an opportunity or threat. This foresight helps firms predict changes and act accordingly as early as possible in a customer-centred way and highlights the customer experience as the heart of the innovation process (Kaplan 2012). Fifth, BMI presents excellent opportunities for incumbents if the overall procedure is a systematic (i.e. ST oriented) mix of combination, experimentation, feedback, monitoring, and connecting. The right technology combined with an innovative BM provides a promising approach to surviving in the current "age of the customer".

Beside these opportunities, several challenges are emerging for incumbent firms. First, to understand where the "next big thing" is coming from and how to create a new BM as an appropriate response, incumbent firms should give up thinking and acting within traditional

[86] There are five factors that minimize the risk of value for innovation: low complexity, strong relative performance advantage, huge overlap with customer expectations, possibility for testing, and high visibility in the market Rogers (1995).

boundaries because established industry and market boundaries are increasingly dissolving. Second, to fulfil requirements and exploit opportunities, a key aspect for incumbents and their management is comfort with ambidexterity (O'Reilly & Tushman 2008), especially when exploring and implementing new BMs parallel to existing ones. In this context, the focus is on culture as there is a special need to create a dual culture in which one part of an organization continues with current business and attempts to reach a high level of performance (performance culture) while another part of the organization operates at the forefront of (disruptive) innovation (innovation and entrepreneurial culture). Third, renewal activities require new competencies, new modes of operation, and new and innovative BMs. Incumbents can face difficulties when creating new sources of growth with (digital) BMI. This reveals one of the greatest barrier for incumbents—missing skills (e.g., in mobile technologies, predictive analytics, and social media marketing) (Westerman *et al.* 2014). Large firms have recently started investing in and collaborating with start-ups, but many corporate venture activities are conducted with the aim of hiring smart people with needed skills (also known as "acqui-hiring"). Having the right digital skills is an important source of competitive advantage and a key enabler of digital transformation. Firms that build skills faster will get ahead. However, even if incumbent firms become (remain) the (new) market leader, it is only a matter of time for today's hunters to be transformed to the hunted.

Beside opportunities and challenges for firms, the developments discussed here also offer interesting potential for future research activities. While the BM literature is being consolidated to some degree, there remain more questions than answers regarding the BM concept and the attendant processes (i.e., BMI) considering the new trends and technologies. Promising future research pathways can be categorized into strategic, operational, and economic (model) levels.[87]

On the strategic level, an interesting field of study is seeking to understand the mechanisms, connectivity, and interdependency between BMs and competition in more detail (based on thoughts in the introduction of this thesis). This is increasingly interesting because the pace, intensity, and manner of competition is changing dramatically. There is little known so far about BMI and its competitive effect (Casadesus-Masanell & Zhu 2013). To date, no detailed

[87] These three distinctions represent the three main components of a BM. See page 3.

study exists that empirically addresses topics such as how the (right) BM influences competition and vice versa. Just as renewal of existing BMs can reorder entire business systems, it can also create major shifts in the competitive landscape (Teece 2010) and would thus be interesting to examine in more detail. Another promising research avenue on the strategic level is driven by digitization and new digital technology. New forms of BMI are emerging (e.g., combinatorial BMI inside ecosystems with different partners) that are not yet understood (or even defined) in detail. As recent examples such as Apple and FitBit show, the ecosystem becomes intensively important from an innovation perspective. It seems that even incumbents must participate in an existing ecosystem or create their own.[88] Otherwise, they could fail in the near future.

On the operational (model) level, there are three interesting pathways for future studies. First, it would be interesting to examine the difference between a structured systematic procedure (i.e., step-by-step approach) and a purely experimental, game-oriented approach to creating an innovative BM (e.g., Gudiksen 2015). So far, it is unknown whether any one approach would create more valuable outcome in terms of innovative BM. Second, it would be interesting to examine how a well-executed BM renewal or innovation, including its operational underpinnings (i.e., deployment), can protect against replication and imitation and become a competitive advantage. Third, in the context of firms' resources, BMs and managerial choices focused on timing and organizational modes are understudied and thus interesting topics.

An interesting pathway on the economic level (i.e. on a tactical level) is the link between specific BM designs and their impact on actual business model performance outcomes in terms of added value for incumbent firms and other stakeholders. Furthermore, incumbent firms' need to quickly build personal skills regarding new technologies and BMI capability requires deeper understanding of the appropriate approaches and why some are more successful than others.

[88] Another current example is Boeing and its creation of an "aerospace ecosystem". Boeing increased digital tracking of individual parts and components of their customers (airlines) and worked with firm such as Fujitsu and IBM through their RFID and automated intelligence tracking products to create new and innovative BMs.

One last but highly promising research pathway belongs to no single category. A broad field for potential future studies is the relationship between disruptive technology and BMs. With exponential technological innovation and continuous environmental change, a permanent rethinking of established BMs is crucial (Chesbrough 2010). The combination and convergence of technologies creates new disruptive business potential and is directly connected to firm performance (Aversa *et al.* 2015a). Furthermore, each technological innovation should be combined with an innovative BM so the inventor can capture its value (Teece 2010). For example, 3-D printing (and other new desktop production technologies) is creating a new self-maker industry (a hybrid of a traditional industry firm and an Internet start-up) as well as new value propositions and a new BM that was unimaginable only a few years ago (Anderson 2013). These developments leverage traditional manufacturing and enable aspiring inventors and entrepreneurs to realize their ideas with a minimum of time and resources than what was required a decade ago. This area is highly understudied and thus often wrongly understood. Another breakthrough in this context that is also not yet understood in detail is the importance of two-sided or multi-sided Internet (technology) platforms and the related BMs (Muzellec *et al.* 2015). There is a substantial need to understand the technology as well as the underlying economics of such platforms. It is also feasible to think further about automated platforms where all smart systems (i.e., CPSs) share information and automatically interact with each other. Soon everyone (every device) will have access everywhere to everything on the Internet. These potential study areas are not passing trends. They will dramatically determine practice as well as innovation research in the coming years.

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Appendix

I. Content structure of the attached data medium

00 Dissertation

10 Business Model Literature

20 Interviews

Main Study Interviews

Pre Study Interviews

30 Evaluation

Code System

MAXQDA Files

40 Action Case Studies Documentation

Cassidian

Sanofi

Siemens

50 Published Articles

II. List of publications

Scholarly Journal Article

- Halecker, B. (2015) Action Case Study – A Research Strategy based on Abduction for relevant and rigorous Management Research, in: International Journal of Business

Research, Vol. 15, 4, p. 23-32.

- Halecker, B.; Hartmann, M.; Hölzle K. (forthcoming) Konzeptrahmen zur systemwirtschaftlichen Bewertung von Geschäftsmodellalternativen, in ZfKE (accepted February 2015)
- Halecker, B.; Hölzle, K. (2014) Klassifikation von Methoden zur Geschäftsmodellinnovation entlang eines system-orientierten Konzeptes, in: ZfKE, Vol. 62, No. 2: 183–190.
- Halecker, B.; Hartmann, M. (2013) Contribution of Systems thinking to Business model Research and Business model Innovation, in: International Journal of Technology Intelligence and Planning, Vol. 9, 4, p. 251 – 270.

Refereed Conference Paper

- Hartmann, M.; Halecker, B. (2015) *Critical Infrastructure Security in Smart Ecosystems*, Future City Challanges Conference, HTW Berlin & Metropolia, Berlin, Germany, 15.-16. Oktober 2015
- Halecker, B.; Hölzle K. (2015) *Geschäftsmodellinnovation etablierter Unternehmen mit Hilfe von Corporate Venturing – eine Umfrage bei deutschen Unternehmen*, 19. Interdisziplinäre Jahreskonferenz zu Entrepreneurship, Innovation und Mittelstand, G-Forum, Kassel, Germany, 8.-9. Oktober 2015
- Halecker, B. (2015) *Using Action Case Study Research to explain Business Model Innovation – Experience from Pharmaceutical, Defense, and Energy Infrastructure*, 31th EGOS Colloquium – Organizations and the Examined Life: Reason, Reflexivity and Responsibility. Athen, Greece, July 2015
- Hartmann, M.; Halecker, B. (2015) *Management of Innovation in the Industrial Internet of Things*, XXVI ISPIM Conference – Shaping the Frontiers of Innovation Management. Budapest, Hungary, June 2015
- Halecker, B.; Hölzle, K. (2014) The Action Case Study Approach for Business Model Innovation Research, Wissenschaftstagung 2014 der Erich-Gutenberg-

Arbeitsgemeinschaft Köln e.V. (Special Issue Business Model Innovation and Transformation des Journal of Business Economics), September 2014, Nürnberg, Germany

- Halecker, B.; Bickmann, R.; Hölzle, K. (2014) *Failed Business Model Innovation – a theoretical and practical Illumination on a feared phenomenon*, R&D Conference, June 2014, Stuttgart, Germany, Verfügbar unter: http://ssrn.com/abstract=2449211
- Kamprath, M; van den Broek, A.; Eppinger, E.; Halecker, B. (2014) *How to paint the Canvas? – The Business Model Environment Template*, XXV ISPIM Conference – Innovation for Sustainable Economy & Society. Dublin, Ireland, June 2014
- Halecker, B. (2013): *Working with Business Models in Practice – From concept to reality*, BAM 2013 Doctoral Symposium, Liverpool, England, September 2013
- Halecker, B./ Hartmann, M. (2013): *How can System Thinking add Value to Business Model Innovation?*, XXIV ISPIM Conference – Innovating in global markets: Challenges for sustainable growth. Helsinki, Finland, June 2013
  ISBN: 978-952-265-421-2
- Halecker, B./ Braun, A. (2012): Produktivitätssteigerung von technologieorientierten Dienstleistungen – Beispiele aus der Personalisierten Medizin, 3. Rostocker Dienstleistungstagung, Rostock 13.-14.09.2012
- Kamprath, M./ Halecker, B. (2012): A Systematic Approach for Business Model Taxonomy – How to operationalize and compare large Quantities of Business Models? 5th ISPIM Innovation Symposium, Seoul, Korea, 09.-12.12.2012

Books/ Book Chapter

- Hartmann, M.; Halecker, B. (2015) Management Prinzipien in der Industrie 4.0, in Schäfer, S.; Pinnow, C. (2015) Industrie 4.0 - Grundlagen und Anwenungen, Beuth Verlag Berlin
- Hartmann, M.; Halecker, B. (2015) Nachhaltige Mobilität im digitalen Zeitalter, in Knaut M. (Hrg.) (2015) Nachhaltige Mobilität, Energiewende und Industrie 4.0, Schriften der Hochschule für Technik und Wirtschaft Berlin

- Halecker, B.; Hölzle, K. (2015) Neuausrichtung von Geschäftsmodellen – am Beispiel Pharma, in: Eppinger, E.; Halecker, B.; Hölzle, K.; Kamprath, M. (Hrg.) (2015) Dienstleistungspotentiale und Geschäftsmodelle in der Personalisierten Medizin, Springer Gabler Verlag
- Halecker, B.; Kamprath, M.; Braun, A. (2015) Geschäftsmodelle in der Personalisierten Medizin – konzeptioneller Rahmen zum Status quo und Perspektiven, in: Eppinger, E.; Halecker, B.; Hölzle, K.; Kamprath, M. (Hrg.) (2015) Dienstleistungspotentiale und Geschäftsmodelle in der Personalisierten Medizin, Springer Gabler Verlag
- Eppinger, E.; Halecker, B.; Hölzle, K.; Kamprath, M. (Hrg.) (2015) Dienstleistungspotentiale und Geschäftsmodelle in der Personalisierten Medizin, Springer Gabler Verlag. ISBN: 978-3-658-08402-8
- Halecker, B.; Hartmann, M. (2014) Das Geschäftsmodell als "Strategic Deployment" im strategischen Denken, in: Schallmo (Hrg.) Kompendium Geschäftsmodell-Innovation, Springer Gabler Verlag
- Halecker, B.; Braun, A.; Eppinger, E. (2014) Produktivitätssteigerung von technologieorientierten Dienstleistungen – Beispiele aus der Personalisierten Medizin, in: Bornewasser, M.; Kriegesmann, B.; Zülch, J. (Hrg.) Dienstleistungen im Gesundheitssektor, Springer Gabler Verlag
- Halecker, B. (2013) Eine system-orientierte Betrachtung des Geschäftsmodell-Konzeptes – Eine Literaturanalyse, GRIN Verlag, ISBN: 9783656841043

Report

- Halecker, B.; Hölzle, K.; Kayser, H. (2015) Corporate Venturing und Geschäftsmodellinnovation – Status quo in deutschen Unternehmen, eine deutschlandweite Studie bei DAX, MDAX und TechDAX Konzernen mit insgesamt 100 Teilnehmern, ISSN: 2193-9543, DOI 10.13140/RG.2.1.2462.0247
- Halecker, B.; Hölzle, K.; Sittner, M. (2014) Business Development und Geschäftsmodellinnovation: Status quo und zukünftige Entwicklungen, Eine

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- Halecker, B,; Hölzle, K,; Sittner, M. (2014) Result Report of the Study Business Development and Business Model Innovation – Status quo and Future Development, DOI 10.13140/RG.2.1.4214.4804

III. Review results of BM and BMI articles regarding methodology and research design

No.	Paper type	Research Approach	Research Strategy (No.)	Choices	Time Horizon	Data collection and data analysis (notes)	Authors
1.	empirical paper	Inductive (abductive)	Case Study (14)	Multi-Method	cross-Sectional	questionnaire, workshop (notes)	Frankenberger, K., Weiblen, T., Csik, M., & Gassmann, O. (2013)
2.	empirical paper	inductive (abductive)	Survey (151)	Mixed Method	cross-Sectional	(Pilot) Interviews (12?), observations, questionnaire; discourse analysis	George, G., & Bock, A. J. (2011)
3.	empirical paper	inductive	Case Study (1)	Mono Method	cross-Sectional	Interviews (15)	Cule, P. E., & Robey, D. (2004)
4.	empirical paper	inductive	Archival research	Mono Method	Longitudinal	secondary data (press, magazines), Content analysis	Bohnsack, R., Pinkse, J., & Kolk, A. (2014)
5.	empirical paper	inductive	Archival research	Mono Method	longitudinal	secondary data (multiple sources)	Thoma, G. (2009)
6.	empirical paper	inductive	Case Study (25)	Multi-Method	Longitudinal	Interviews (?), Secondary data (annual reports, newspaper articles, website)	Achtenhagen, L., Melin, L., & Naldi, L. (2013)
7.	empirical paper	inductive	Case study (59)	Multi-Method	cross-Sectional	questionnaire, data base, secondary data (annual reports, investment analyist reports, website)	Amit, R., & Zott, C. (2001)

8.	empirical paper	inductive	Case Study (1)	Multi-Method	cross-Sectional	secondary (archivial) data (minutes, industry analysis, correspondence), Interviews (14)	Aspara, J., Lamberg, J. A., Laukia, A., & Tikkanen, H. (2013)
9.	empirical paper	inductive	Case Study (1)	Mono Method	cross-Sectional	Interview (?)	Assimakopoulos, D., & Yan, J. (2008)
10.	empirical paper	inductive	Case Study (3)	Multi-Method	longitudinal	observation, interviews (13), secondary data (presentation, workshops, seminars), archival data (business plans, annual reports, brochures etc.)	Björkdahl, J. (2009)
11.	empirical paper	inductive	Case Study (11)	Multi-Method	cross-Sectional	(explorative) interviews, desk research, cross case analysis	Bucherer, E., Eisert, U., & Gassmann, O. (2012)
12.	empirical paper	inductive	Case Study (1)	Mono Method	Longitudinal	Secondary data	Demil, B., & Lecocq, X. (2010)
13.	empirical paper	inductive	Case Study (1)	Multi-Method	cross-sectional	Interviews (16), secondary data (archival data, reports etc.)	Desyllas, P., & Sako, M. (2013)
14.	empirical paper	inductive	Case Study (4)	Multi-Method	cross-sectional	(multiple) Interviews (17); secondary data	Dmitriev, V., Simmons, G., Truong, Y., Palmer, M., & Schneckenberg, D. (2014)
15.	empirical paper	inductive	Case Study (1)	Multi-Method	longitudinal	Interview (3), secondary data (documents, business plans, press etc.)	Doganova, L., & Eyquem-Renault, M. (2009)

16.	empirical paper	inductive	Case Study (1)	Multi-Method	longitudinal	Interviews (71), secondary data (archival material)	Dunford, R., Palmer, I., & Benveniste, J. (2010)
17.	empirical paper	inductive	Case Study (9)	Multi-Method	cross-Sectional	Interviews (15), secondary data (archival, publicy available documents)	Enkel, E., & Mezger, F. (2013)
18.	empirical paper	inductive	Case Study (8)	Multi-Method	cross-Sectional	Interviews (12?), secondary data (Websites, media reports, press)	Frankenberger, K., Weiblen, T., & Gassmann, O. (2014)
19.	empirical paper	inductive	Case Study (1)	Mono Method	longitudinal	Secondary data (annual reports, press etc.)	Froud, J., Johal, S., Leaver, A., Phillips, R., & Williams, K. (2009)
20.	empirical paper	inductive	Case Study (2)	Mixed Method	longitudinal	secondary data (industry reports, presentations, archival information), Interviews (12); open and analytic Coding	Günzel, F., & Holm, A. B. (2013)
21.	empirical paper	inductive	Case Study (1)	Multi-Method	Longitudinal	Interviews (49), Group Session, Observations, Secondary data (Intranet, publication)	Khanagha, S., Volberda, H., & Oshri, I. (2014)
22.	empirical paper	inductive	Case Study (16)	Multi-Method	cross-Sectional	Interviews (19), secondary data (archival data, press, website etc.)	Klang, D., & Hacklin, F. (2013)
23.	empirical paper	inductive	Case Study (3)	Multi-Method	Longitudinal	Interviews (25+9), secondary data (website, annual reports, promotial documents, press)	Lehoux, P., Daudelin, G., Williams-Jones, B., Denis, J. L., &

							Longo, C. (2014)
24.	empirical paper	inductive	Case Study (60)	Mixed Method	cross-Sectional	Interviews (60), Secondary data (Pre-Study Survey)	Mangematin, V., Lemarié, S., Boissin, J. P., Catherine, D., Corolleur, F., Coronini, R., & Trommetter, M. (2003)
25.	empirical paper	inductive	Case Study (1)	Multi-Method	longitudinal	Interviews (65), secondary data (meeting notes), observation,	Miller, K., McAdam, M., & McAdam, R. (2014)
26.	empirical paper	inductive	Case Study (12)	Multi-Method	Longitudinal	Interviews (186), secondary data (presentations, white papers etc.)	O'Connor, G. C., & Rice, M. P. (2013)
27.	empirical paper	inductive	Case Study (>20)	Mono Method	cross-Sectional	interviews (?)	Perr, J., Appleyard, M. M., & Patrick, P. (2010)
28.	empirical paper	inductive	Case Study (1)	Mixed Method	cross-Sectional	(Workshops), Secondary data (panel data, survey data)	Pynnönen, M., Hallikas, J., & Ritala, P. (2012)
29.	empirical paper	inductive	Case Study (7)	Multi-Method	cross-Sectional	Interviews (pre-study 22; main study ca. 21), secondary data (journals, databases)	Sabatier, V., Craig-Kennard, A., & Mangematin, V. (2012)
30.	empirical paper	inductive	Case Study (4)	Multi-Method	cross-Sectional	Interviews (16), secondary data (documents, press, website)	Sabatier, V., Mangematin, V., & Rousselle, T. (2010)

31.	empirical paper	inductive	Case Study (1)	Multi-Method	longitudinal	interviews (30), secondary data	Sandstrom, C., & Bjork, J. (2010)
32.	empirical paper	inductive	Case Study (12)	Multi-Method	cross-Sectional	Interviews (12), Workshops, additional data sources	Schneider, S., Spieth, P., & Clauss, T. (2013)
33.	empirical paper	inductive	Case Study (1)	Multi-Method	cross-sectional	Interviews (23?), secondary data (internal documents, marketing material)	Sitoh, M. K., Pan, S. L., & Yu, C. Y. (2014)
34.	empirical paper	inductive	Case Study (12)	Multi-Method	cross-Sectional	Interviews (132), observation	Smith, W. K., Binns, A., & Tushman, M. L. (2010)
35.	empirical paper	inductive	Case Study (1)	Multi-Method	longitudinal	Interviews (23), secondary data	Sosna, M., Trevinyo-Rodríguez, R. N., & Velamuri, S. R. (2010)
36.	empirical paper	inductive	Case Study (1)	Multi-Method	longitudinal	Interviews (31), observation/visits (14), secondary data (books, press, website, database)	Svejenova, S., Planellas, M., & Vives, L. (2010)
37.	empirical paper	inductive	Case Study (4)	Multi-Method	cross-Sectional	Interview (17), secondary data	Velamuri, V. K., Bansemir, B., Neyer, A. K., & Möslein, K. M. (2013)
38.	empirical paper	inductive	Case Study (1)	Multi-Method	longitudinal	Interviews (>40), secondary data	Velu, C., & Stiles, P. (2013)

39.	empirical paper	inductive	Case Study (7)	Multi-Method	cross-sectional	observation, interviews (22?)	Wilson, F., & Post, J. E. (2013)
40.	empirical paper	inductive	Case Study (2)	Mono Method	cross-Sectional	Interview (22)	Wirtz, B. W., Schilke, O., & Ullrich, S. (2010)
41.	empirical paper	inductive	Case Study (2)	Multi-Method	cross-Sectional	Interviews (?) observation, secondary data (studies, website, archiv)	Wu, X., Ma, R., & Shi, Y. (2010)
42.	empirical paper	inductive	Case Study (1)	Mixed Method	cross-Sectional	Interviews, observation; questionnaire, archival data	Borgh, M., Cloodt, M., & Romme, A. G. L. (2012)
43.	empirical paper	inductive	Survey	Mono Method	cross-Sectional	(Expert) Interviews (12)	Stampfl, G., Prügl, R., & Osterloh, V. (2013)
44.	empirical paper	deductive (abductive)	Case Study (4)	Multi-Method	cross-Sectional	Interviews (36), secondary data (archiv, internet, media sources)	Habtay, S. R. (2012)
45.	empirical paper	deductive	Survey	Mixed Method	cross-sectional	Interviews (102), literature review, cluster technique	Shin, J. (2014)
46.	empirical paper	deductive	Archival research (117)	Mixed-Method	cross-Sectional	secondary data (directory, database), newsletter, interviews (?); factor analysis, cox regression	Andries, P., & Debackere, K. (2007)
47.	empirical paper	deductive	Archival research	Mono Method	longitudinal	Secondary data (data base); descriptive statistic + correllation + Regression	Björk, J. (2012)
48.	empirical paper	deductive	Archival research	Mixed-Method	cross-Sectional	Interviews (107), regression analysis, factor analysis	Bock, A. J., Opsahl, T., George, G., &

							Gann, D. M. (2012)
49.	empirical paper	deductive	Archival research (310)	Mono Method	cross-sectional	Secondary data (database) , Regression analysis	Denicolai, S., Ramirez, M., & Tidd, J. (2014)
50.	empirical paper	deductive	Archival research (289)	Multi-Method	cross-Sectional	Secondar data; cluster analysis	Morris, M. H., Shirokova, G., & Shatalov, A. (2013)
51.	empirical paper	deductive	Archival research	Multi-Method	cross-Sectional	secondary data analysis; Correlation, regression,	Patzelt, H., Knyphausen-Aufseß, Z., & Nikol, P. (2008)
52.	empirical paper	deductive	Archival research	Multi-Method	cross-Sectional	secondary data; content analysis, (confirmatory) factor analysis, least squares regression, multivariate regression technique	Zott, C., & Amit, R. (2008)
53.	empirical paper	deductive	Experiment	Mono Method	cross-Sectional	questinnaire; principal component analysis, reliability analysis, ANOVA	Eppler, M. J., Hoffmann, F., & Bresciani, S. (2011)
54.	empirical paper	deductive	Experiment	Mono Method	cross-Sectional	game theoretical analysis	Casadesus-Masanell, R., & Zhu, F. (2013)
55.	empirical paper	deductive	Experiment	Mono Method	cross-Sectional	game theoretical analysis	Casadesus-Masanell, R., & Llanes, G. (2011)
56.	empirical paper	deductive	Survey (147)	Mono Method	cross-Sectional	questionnaire, regression analysis	Albers, S., & Clement, M. (2007)

57.	empirical paper	deductive	Survey (146)	Multi-Method	cross-Sectional	questionnaire, cluster analysis, regression analysis	Bonaccorsi, A., Giannangeli, S., & Rossi, C. (2006)
58.	empirical paper	deductive	Survey (151)	Multi-Method	cross-Sectional	questionnaire, telefon call; descriptive statistic	Bourreau, M., Gensollen, M., & Moreau, F. (2012)
59.	empirical paper	deductive	Survey (126)	Mono Method	cross-Sectional	questionnaire; regression analysis	Dewald, J., & Bowen, F. (2010)
60.	empirical paper	deductive	Survey (176)	Mixed Method	cross-sectional	Interview (12), questionnaire; common method variance, multivariate regression analysis	Wei, Z., Yang, D., Sun, B., & Gu, M. (2014)
61.	empirical paper	abductive	Case Study (2)	Multi-Method	cross-Sectional	Interviews (12), secondary (archival) data (presentation, newsletter)	Holm, A. B., Günzel, F., & Ulhøi, J. P. (2013)
62.	empirical paper	abductive	Case Study (3)	Mono Method	cross-Sectional	Interview (?)	Yunus, M., Moingeon, B., & Lehmann-Ortega, L. (2010)

Note: Some articles are lacking transparent in methodology, which makes them difficult to classify. Authors might have different opinion about the classification of their studies.

IV. List of interviews

Nr	Datum	Unter-nehmen	Ort	Gesprächs-partner	Ziel des Gespräches	Notizen/ Kommentare	Dauer min (ca)	Dokumen-tation
1	09.08.2013	Daimler	Stuttgart	Hr. Dr. Gresse	Interview/ Erfahrungsaustausch	Neue Erkenntnisse zum aktuellen Vorgehen und Stand bei BMI, Diskussion des aktuellen Standes und Feedback bekommen	60	Mitschrift/ Notizen
2	11.11.2013	Cassidian	Telefon	Hr. Aust (Portfolie Development)	Kennenlernen/ Vorstellung + Abfrage vom Verständnis zum Geschäftsmodell und der Abgrenzung + Verständnis zur Arbeit mit Geschäftsmodellen	Gutes strategisches Verständnis und die Notwendigkeit von neuen Geschäftsmodellen ist klar. Ausgehend vom Potential (Was will der Kunde eigentlich) lassen sich neue Felder erschließen (Bsp. Radar)	60	Mitschnitt
3	13.11.2013	Cassidian	Telefon	Hr. Gorlo (Leiter Vertrieb Deutschland)	Kennenlernen/ Vorstellung + Abfrage vom Verständnis zum Geschäftsmodell und der Abgrenzung + Verständnis zur Arbeit mit Geschäftsmodellen	Geschäftsmodelle sind Produkte die einer Strategie folgen. GM werden im Rahmen von großen Verträgen aufgesetzt und konzipiert (im Notfall auch recht schnell). Ziel ist ein gemeinsames Verständnis von GM und einer Systematik bei der Erstellung (mit Fokus auf die Verträge)	45	Mitschnitt

4	05.11.2013	Cassidian	Telefon	Hr. Dr. Wischmann (Head of Operations)	Kennenlernen/ Vorstellung + Abfrage vom Verständnis zum Geschäftsmodell und der Abgrenzung + Verständnis zur Arbeit mit Geschäftsmodellen	Als Head of Operations hat Hr. Wischmann nicht strategisch sondern nur operativ mit dem Geschäftsmodell im Rahmen der Produktions(fabriken) zu tun. Die Herausforderung besteht in der Standardisierung der Leistung und der Internationalisierung	45	Mitschnitt
5	03.12.2013	Sanofi	Berlin	Hr. Wunderlich (Head of Sales Hospitals)	Kennenlernen/ Vorstellung + Abfrage von Erfahrungshintergund, Verständnis von Geschäftsmodell und Arbeit mit Geschäftsmodellen (Ideen, Bewertung, Umsetzung)	Gutes klares Verständnis was ein Geschäftsmodell ist. Sieht die Notwendigkeit in einem Umdenken im Geschäftsmodell von Sanofi. Gerade für die Vertriebseinheit ist ein "Sales Model" von Interesse.	45	Mitschnitt
6	03.12.2013	Sanofi	Berlin	Hr. Steinmeier (Head of KAM)	Kennenlernen/ Vorstellung + Abfrage von Erfahrungshintergund, Verständnis von Geschäftsmodell und Arbeit mit Geschäftsmodellen (Ideen, Bewertung,	Sieht die Notwendigkeit in einer Veränderung des Geschäftsmodell. Diese wird immer erst nötig, wenn es schon weh tut. Sanofi hat neue Geschäftsmodelle als Strategie. Sieht einen Schwerpunkt in der Bewertung von Geschäftsmodellideen anhand	45	Mitschnitt

					Umsetzung)	von finanziellen Berechnungen.		
7	06.12.2013	Sanofi	Berlin	Hr. Kietzmann (Leiter Innovation)	Vorbereitung Workshop I und Kennenlernen der bestehenden Vorgehensweisen bei der Innovation	Mehrer Ansätze "beyond the pill" diskutiert und besprochen. Sein Thema liegt auf Diagnostik, Telemedizin, Apps, Services. Wichtiger Pain Point ist die Umsetzung erfolgreicher Projekte, so dass die Arbeit honoriert und wahrgenommen wird. Viele Organisatorische Hürden innerhalb des Konzerns zu bewählten bei der Umsetzung.	60	Mitschnitt
8	20.01.2014	UFA	Potsdam	Sven Gronemeyer (Leiter Business Development)	Kennenlernen und Erfahren wie Business Development und GMI zusammenpassen und wie die Arbeit mit GMI aussieht.	Inhaltliches Business Development bezieht sich auf neue Produkte oder neue Distributionsformen. Geschäftsmodell aktuell basiert auf Auftragsproduktion und (Auslands)Vertrieb. GMI spielt in den Überlegungen eine wichtige Rolle. Als Beispiel "Verbotene Liebe" App. läuft parallel zur Sendung und liefert u.a. Information welche Sachen die Darsteller tragen und wo diese zu kaufen sind. Gescheitert Aufgrund von politischen und	45	Mitschnitt

						rechtlichen Themen.		
9	24.01.2014	Roland Berger	Telefon	Michael Zollenkop	Kennenlernen, Austausch zu praktischer Relevanz von GMI und Vorstellung erster Ergebnisse der MA von Rene Bickmann	GMI ist gerade ein heißes Thema bei Unternehmen. Wird jedoch häufig nicht als solches bezeichnet. Unternehmen haben häufig Fragen zur strategischen Aufstellung, da Umsatz gesteigert werden soll das alte GM jedoch Grenzen aufweist. Szenarien sind zur strategischen Optionsrealisierung. Branchen im Umbruch haben besonderen Need zur GMI. Technologische Umbrüche machen GMI notwendig.	60	Mitschnitt
10	06.02.2014	Daimler Finance	Telefon	Eva Bucherer	Kennenlernen, Austausch zu praktischer Relevanz von GMI und Vorstellung erster Ergebnisse der MA von Rene Bickmann		45	Mitschnitt
11	30.01.2014	Uni-versität Ulm	Telefon	Dr. Daniel Schallmo	Austausch zum Scheitern von Geschäftsmodellen als		28	Mitschnitt

					auch zum Prozess der GMI			
12	13.09.2013	Cassidian	Berlin	Hr. Schnappauf	Interview/ Abstimmung zum weiteren Vorgehen	Neue Erkenntnisse zum aktuellen Vorgehen zum BD und BMI; Zusage zur gemeinsamen Forschung	60	Mitschnitt
13	16.09.2013	Siemens	Berlin	Hr. Baars; Hr. Dr. Kuschel	Interview/ Abstimmung zum weiteren Vorgehen	Neue Erkentnisse zum aktuellen Vorgehen zum BD und BMI; Zusage zur gemeinsamen Forschung	90	Mitschnitt
14	16.09.2013	Toll Collect	Berlin	Hr. Dr. Blum	Kennenlernen/ Vorstellung	Forschungsvorhaben diskutiert, Feedback zu Unterlagen bekommen,	45	Mitschrift/ Notizen
15	26.09.2013	Toll Collect	Berlin	Hr. Dr. Blum	Interview/ Befragung zum Verständnis und Management von innovativen Geschäftsmodellen	Neue Erkentnisse zur Exploration, Bewertung und Umsetzung von Geschäftsmodellen - Toll Collect ist im Gesamtprozess sehr weit	70	Mitschnitt
16	27.09.2013	Cornelsen	Berlin	Hr. Biese	Interview/ Erläuterung des möglichen Vorgehens	Erkentniss über das Vorgehen bei Cornelsen hinsichtlich Exploration, Bewertung und Handlungsprogramm	45	Mitschnitt

17	30.09.2013	Sanofi	Berlin	Hr. Dr. Kietzmann	Erläuterung des möglichen Vorgehens	Erkennen der Schwierigkeiten innerhalb einer Landesgesellschaft hinsichtlich strategischer Themen gegenüber der Zentrale Hr. Kietzmann ist angetan vom Vorgehen und will es intern abstimmen	50	Notizen
18	30.09.2013	Siemens	Berlin	Hr. Baars	Interview + Case Study (Understanding), Projektskizze erstellen, Termine festlegen + weiteres Vorgehen	Verstehen der aktuellen Situation, Arbeitsweise und Themen hinsichtlich Business Development und Innovativen Geschäftsmodellen. Vorstellen von Methoden und Instrumenten (Strategie, Ziele, BSC,	60	Mitschnitt
19	27.02.2013	Societe General	Hamburg	Hr. Essig	Kennenlernen und Interview zur Vorstudie im Rahmen der Dissertation		60	Mitschnitt
20	08.03.2013	Cornelsen	Berlin	Hr. Biese	Kennenlernen und Interview zur Vorstudie im Rahmen der Dissertation		45	Mitschnitt
21	14.03.2013	Cassidian	Berlin	Hr. Schappauf	Kennenlernen und Interview zur Vorstudie im Rahmen der Dissertation		60	Mitschnitt

22	10.04.2013	Anaxon	Telefon	Dr. Rascher-Eggstein	Kennenlernen und Interview zur Vorstudie im Rahmen der Dissertation		45	Mitschnitt
23	13.04.2013	Sanofi	Berlin	Dr. Kietzmann	Kennenlernen und Interview zur Vorstudie im Rahmen der Dissertation		80	Mitschnitt
24	23.04.2013	BVG	Berlin	Hr. Gast, Fr. Rosenkranz	Kennenlernen und Interview zur Vorstudie im Rahmen der Dissertation		60	Mitschnitt
25	15.05.2013	MyToys	Berlin	Hr. Scholl	Kennenlernen und Interview zur Vorstudie im Rahmen der Dissertation		45	Mitschnitt
26	21.05.2013	Beiersdorf	Telefon	Hr. Biel	Kennenlernen und Interview zur Vorstudie im Rahmen der Dissertation		50	Mitschnitt
27	21.05.2015	Siemens	Berlin	Hr. Dr. Kuschel, Hr. Baars	Kennenlernen und Interview zur Vorstudie im Rahmen der Dissertation		60	Mitschnitt
Nicht verwendete Interviews								

	23.03.2015	*Sanofi*	*Persönlich*	*Hardy Kietzmann*	*Verstehen des Verlaufes der gemeinsam entwickelten Idee bis hinzum aktuellen Prototypen*	*Eine der entwickelten Ideen aus den Workshops wurde nach dem Ende unserer Zusammenarbeit weiterentwickelt und in einem umfassenden Konzept verpackt. Dieses steht kurz vor der Prototypischen Umsetzung in der ersten Stufe und wird zeitnah auch per Presse veröffentlicht*	*60*	*Mitschrift/ Notizen*
	22.11.2013	*Siemens*	*Telefon*	*Hr. Kahrimann (Vertriebsingenieur)*	*Kennenlernen/ Vorstellung + Abfrage von Erfahrungshintergund, Verständnis von Geschäftsmodell und Arbeit mit Geschäftsmodellen*	*Praxisorientierte Sicht auf (da Ingenieur) auf das Prüffeld und dem Vertrieb des bestehenden Produktes. GM gut definiert. Haben schon Überlegungen angestellt Prüfungen auch von anderen Materialien anzubieten und durchzuführen (u.a. Holz, Metall)*	*13*	*Mitschnitt*