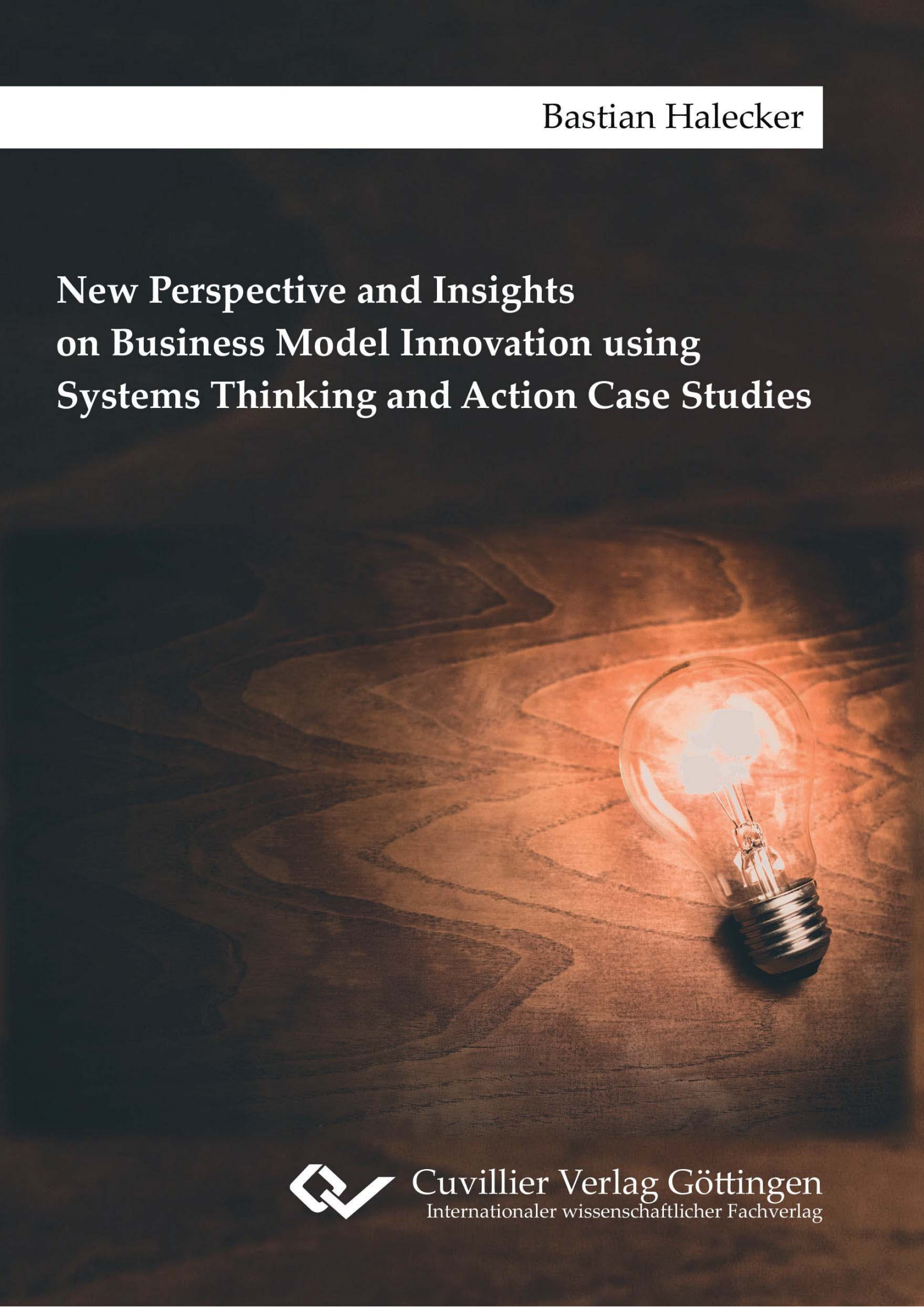
Bastian Halecker

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



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

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Submitted by

Bastian Halecker

from Berlin, Germany

Supervised by

Prof. Dr. Katharina Hölzle (University of Potsdam)

and

Prof. Dr. Matthias Hartmann (HTW Berlin)

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DANKSAGUNG

Eine Dissertation zu erstellen ist für jemanden, der an einer Fachhochschule studiert hat, einige Jahre als Unternehmensberater tätig war und der stark unternehmerisch getrieben ist, eine besonders große Herausforderung. Gerade das fundierte und tiefgreifende wissenschaftliche Arbeiten an einem spezifischen Thema über einen Zeitraum von mehreren Jahren ist überaus anspruchsvoll. Am Ende jedoch hat das Durchlaufen des gesamten Promotionsprozesses zu zahlreichen neuen Einsichten und Erfahrungen geführt. In den vier Jahren als wissenschaftlicher Mitarbeiter und Doktorand gab es verschiedene Phasen mit unterschiedlicher Intensität. Einige davon hatten direkt mit dem Promotionsvorhaben zu tun, andere eher weniger. Hierbei war es wichtig und hilfreich, neben der permanten Ausrichtung auf Ziel, Zeit und Ergebnis, sich auf zahlreiche Unterstützer und Wegbegleiter verlassen zu können.

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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 frequently than in the past (Doz & Kosonen 2010). They must often run two or more BMs

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

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]

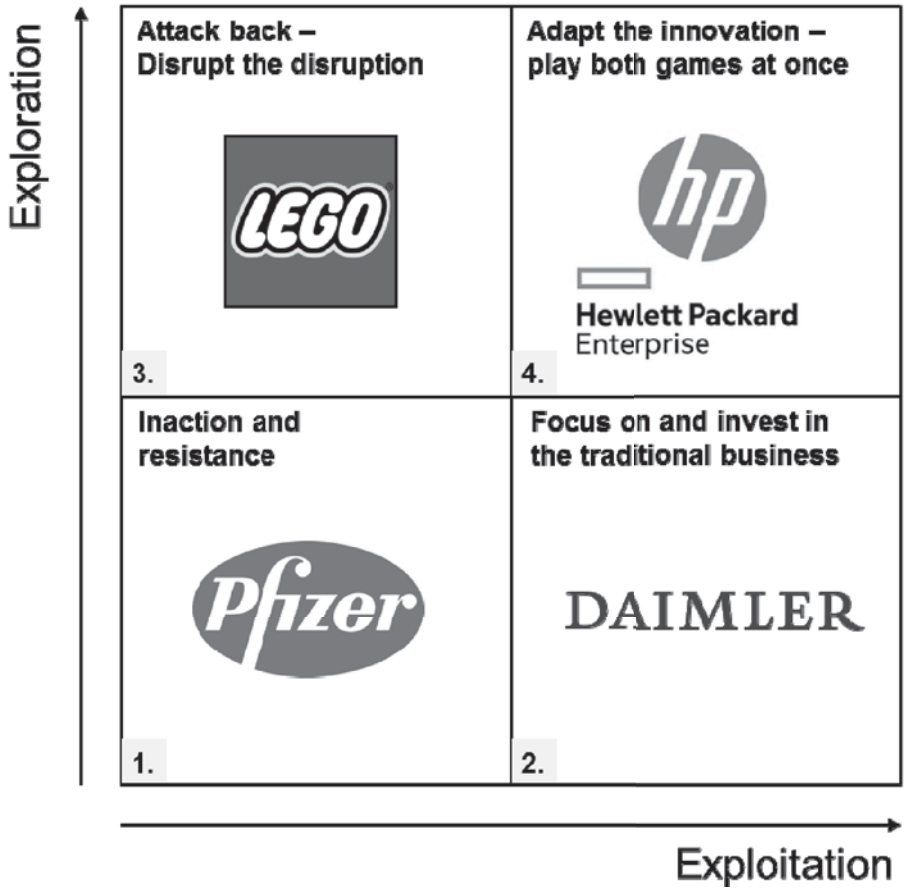

Figure 1: Options of incumbent firm responses to external changes i.e. disruptions (Source: Author's figure)

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

[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

a digital therapy approach. Another innovative BM uses location based data to alter 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

[8] More details on www.propellerhealth.com

explore new avenues for growth. The company developed new and relatively inexpensive 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