

JYU DISSERTATIONS 275

Toni Luhti

Factors of Inertia in Technology- Triggered Business Model Transformation Process



UNIVERSITY OF JYVÄSKYLÄ
FACULTY OF INFORMATION
TECHNOLOGY

JYU DISSERTATIONS 275

Toni Luhti

Factors of Inertia in Technology-Triggered Business Model Transformation Process

Esitetään Jyväskylän yliopiston informaatioteknologian tiedekunnan suostumuksella
julkisesti tarkastettavaksi syyskuun 17 päivänä 2020 kello 12.

Academic dissertation to be publicly discussed, by permission of
the Faculty of Information Technology of the University of Jyväskylä,
on September 17, 2020 at 12 o'clock noon.



JYVÄSKYLÄN YLIOPISTO
UNIVERSITY OF JYVÄSKYLÄ

JYVÄSKYLÄ 2020

Editors

Marja-Leena Rantalainen

Faculty of Information Technology, University of Jyväskylä

Timo Hautala

Open Science Centre, University of Jyväskylä

Copyright © 2020, by University of Jyväskylä

Permanent link to this publication: <http://urn.fi/URN:ISBN:978-951-39-8263-8>

ISBN 978-951-39-8263-8 (PDF)

URN:ISBN:978-951-39-8263-8

ISSN 2489-9003

ABSTRACT

Luhti, Toni

Factors of inertia in technology-triggered business model transformation process
Jyväskylä: University of Jyväskylä, 2020, 99 p.

(JYU Dissertations

ISSN 2489-9003; 275)

ISBN 978-951-39-8263-8

Business model (BM) innovation is one of the key competitive forces that companies must focus on. For established companies, BM innovation often means BM transformation and often it is triggered by new technological innovations. However, there can be many factors that prevents BM transformation process and concurrently block existing businesses' ability to change. These different factors of inertia may arise from many different sources. This has not been considered in the current literature; therefore, this study attempts to address this gap.

Not all BM transformation processes succeed. We found that inertia plays a major role in incumbent companies' BM transformations and can contribute to a failure to implement the BM innovation. This is crucial for business executives, as they must understand how BM transformation is progressing, how they might speed up the process and how they might tackle potential inertia beforehand. In the existing BM transformation literature, inertia factors are rarely identified, and the understanding of these barriers is scattered. Based on the existing literature, we synthesized four types of inertia factors for incumbent companies.

To validate our findings, we constructed two case studies of carefully selected technology companies. The companies' BM transformation processes were already in their implementation phases. Therefore, we were able to gather deep insights about the prior phases of the transformation processes through interviews with the key decision-makers and key persons of the companies.

The results of this study revealed a remarkable number of different types of inertia at every stage of the transformation process. Our findings address the assumption that inertia exists in all stages of the BM transformation process, yet the form of inertia differs in each stage. This point was not found in the existing literature. Therefore, by combining the results of the literature review and empirical studies, our contribution relies on the evidence that inertia can be categorized, that it exists in all stages of the transformation process, and that different stages entail distinct forms of inertia.

Keywords: business model, change process, business model transformation, inertia, transformation process, barriers to change

TIIVISTELMÄ (ABSTRACT IN FINNISH)

Luhti, Toni

Inertiatekijät teknologialähtöisessä liiketoimintamallien muutosprosessissa

Jyväskylä: Jyväskylän yliopisto, 2020, 99 s.

(JYU Dissertations

ISSN 2489-9003; 275)

ISBN 978-951-39-8263-8

Liiketoimintamalli-innovaatiot ovat yksi tärkeimmistä kilpailutekijöistä, joihin yritysten on keskityttävä. Olemassa oleville yrityksille tämä tarkoittaa usein olemassa olevan liiketoimintamallin muutosprosessia, joka usein lähtee liikkeelle uudesta teknologisesta innovaatiosta. On kuitenkin useita tekijöitä, jotka estävät tai hidastavat liiketoimintamallin muutosta onnistumasta. Nämä monet erilaiset inertiatekijät voivat johtua monista eri syistä. Tämä näkökulma puuttuu nykyisestä kirjallisuudesta ja siihen tämä tutkimus keskittyy.

Kaikki liiketoimintamallien muutokset eivät onnistu. Havaitimme, että muutoksen hitaus voi olla merkittävä tekijä muutosprosessissa ja tämä voi pahimmillaan johtaa muutostyöstä luopumiseen. Tämä näkemys on elintärkeää yritysjohtajille, koska heidän on ymmärrettävä, miten liiketoimintamallin muutos etenee, miten he voivat nopeuttaa prosessia ja miten he voivat puuttua mahdollisiin estäviin tekijöihin mahdollisesti jo etukäteen. Nykyisessä liiketoimintamallien muutoskirjallisuudessa inertiatekijät tunnistetaan harvoin ja ymmärrys näistä esteistä on hyvin pintapuolista. Olemassa olevan kirjallisuuden perusteella kategorioimme neljän tyyppistä inertiaa.

Inertiatekijöiden validoimiseksi toteutimme kaksi tapaustutkimusta huolellisesti valituista teknologiayrityksistä. Yritysten liiketoimintamallien muutosprosessit olivat jo käyttöönottovaiheessa, joten pystyimme keräämään havaintoja muutosprosessien aikaisemmista vaiheista haastatteluilla keskeisten päätöksentekijöiden ja yritysten avainhenkilöiden avulla.

Tämän tutkimuksen tulokset paljastivat huomattavan määrän inertiatekijöitä muutosprosessin jokaisessa vaiheessa. Tuloksemme sisältävät olettamuksen, että hitautta ja esteitä esiintyy kaikissa muutosprosessin vaiheissa, mutta inertian muoto vaihtelee vaiheiden välillä. Tätä ymmärrystä ei löydy olemassa olevasta kirjallisuudesta. Siksi yhdistämällä kirjallisuuskatsauksen ja empiiristen tutkimusten tulokset, kontribuutiomme perustuu todisteisiin siitä, että inertiaa esiintyy kaikissa muutosprosessin vaiheissa, sitä voidaan luokitella ja eri vaiheissa inertia on erilaista.

Avainsanat: liiketoimintamalli, muutosprosessi, liiketoimintamallin muutos, hitaus, muutosprosessi, muutoksen esteet

Author Toni Luhti
Faculty of Information Technology
University of Jyväskylä
Finland
toni.luhti@gmail.com
0000-0001-8424-4966

Supervisors Mikko Siponen
Faculty of Information Technology
University of Jyväskylä
Finland

Eetu Luoma
Faculty of Information Technology
University of Jyväskylä
Finland

Reviewers Veikko Seppänen
Department of Economics
University of Oulu
Finland

Juan Garbajosa
Department of Computer Science
Technical University of Madrid
Spain

Opponent Xiaofeng Wang
Faculty of Computer Science
Free University of Bozen-Bolzano
Italy

ACKNOWLEDGEMENTS

This is a story of decisiveness. My journey started almost 12 years ago when I decided to become a doctor, and my friends laughed for me. Now, over 500 university-level credits later, it is time to express my gratitude to all those who supported or contributed to my lifelong dream. First, I would like to thank my dear friend and dissertation supervisor, Dr. Eetu Luoma, who passed away suddenly in January 2019. I could not have asked for more unselfish and understanding guidance for my studies. You left us too early. Second, I would like to give my deepest respect to Prof. Dr. Mikko Siponen and Prof. Dr. Tuure Tuunanen, who communicated all requirements, requests, and feedback in a form that I could understand. Without such support and professionalism, I would not have been able to finish my dissertation.

I would also like to thank all of my colleagues, managers and employers for making this happen. Twelve years of studying while working full-time demanded a lot of flexibility and understanding from all of us. Thanks to all my volleyball friends around Finland who have been asking about my graduation and expressed their interest in celebration; their interest pushed me to work through even the hardest of times. It is impossible to list all the people who directly or indirectly helped me throughout this process, so thank you all!

Finally, I cannot thank my daughter Ada and son Alex enough for the moments when you gave me comments that set my focus back on studying. Once Ada told her friends that her father was not smart enough, so he must study as a grown-up. This comment lit an internal fire within me regarding my priorities in daily life. Alex also mocked me multiple times about my need to study every evening and, in that way, forced me to foster my research and allocate time for them as well. I am more than grateful for these comments and proud of how you positively manipulated me to work harder – now it is our turn to laugh.

Tampere 16.04.2020

Toni Luhti

FIGURES

FIGURE 1	Osterwalder's nine-point decomposition of a business model (Chesbrough, 2010).	17
FIGURE 2	Adapted model for business model change (Cavalcante et al., 2011).	21
FIGURE 3	Adapted theory of business model creation and evolution (Ojala, 2016).	22
FIGURE 4	Scenario-based methodology for business model change (Pateli & Giaglis, 2005).	26
FIGURE 5	Key challenges in different types of business model change (adapted from Cavalcante et al., 2017).	31
FIGURE 6	Three-stage business model transformation process.	46
FIGURE 7	Timeline of the business model transformation in Alpha.	54
FIGURE 8	Analyzing Alpha's business model inertia in the transformation process.	60
FIGURE 9	Timeline of Beta's business model transformation.	65
FIGURE 10	Analyzing Beta's business model transformation inertia.	72
FIGURE 11	Summary of inertia factors in case studies.	79

TABLES

TABLE 1	Business model concepts.	20
TABLE 2	Organization of the review and literature (adapted from Pettigrew, 1987).	24
TABLE 3	Process stages of business model transformation.	28
TABLE 4	Process model for business model transformation.	36
TABLE 5	Literature-based propositions for analyzing BM transformation. ...	49
TABLE 6	Classified inertia factors in Alpha's business model transformation.	57
TABLE 7	A conceptual schema for analyzing Alpha's business model inertia.	59
TABLE 8	Classified inertia factors in Beta's business model transformation.	69
TABLE 9	A conceptual schema for analyzing Beta's business model inertia.	72

CONTENTS

ABSTRACT

TIIVISTELMÄ (ABSTRACT IN FINNISH)

ACKNOWLEDGEMENTS

FIGURES AND TABLES

CONTENTS

1	INTRODUCTION	11
1.1	Background and relevance of the topic	11
1.2	Motivation and purpose of the research	13
1.3	Structure of the dissertation	13
2	LITERATURE REVIEW	15
2.1	Identifying the literature.....	19
2.2	Structuring the review	23
2.3	Analysis.....	27
2.3.1	Process of business model transformation.....	27
2.3.2	Context of business model transformation	30
2.3.3	Content of business model transformation.....	32
2.4	Synthesis	33
2.5	Discussion of the literature review	38
2.5.1	Implications for research.....	38
2.5.2	Implications for practice.....	40
2.5.3	Limitations	40
2.6	Conclusion of the literature review.....	41
3	CASE STUDIES: ANALYSIS OF BUSINESS MODEL INERTIA	42
3.1	Introduction.....	42
3.2	Business model transformation review	44
3.3	Business model inertia review	47
3.4	Research method.....	48
3.5	Business model transformation case study: Alpha Ltd.	51
3.5.1	Alpha's transformation process	51
3.5.2	Inertia in Alpha's business model transformation.....	54
3.5.3	Discussion of Alpha's case study.....	57
3.6	Business model transformation case study: Beta Ltd.....	61
3.6.1	Beta's transformation process	61
3.6.2	Inertia in Beta's business model transformation	65
3.6.3	Discussion of Beta's case study	69
3.7	Case study comparison.....	73
3.8	Conclusion of the case studies	74
4	DISCUSSION	76

4.1	Summary of the literature review	76
4.2	Summary of the case studies.....	77
4.3	New contributions	78
4.4	Implications for further studies and business decision-makers	79
4.5	Limitations of the study.....	80
5	CONCLUSION	81
	YHTEENVETO (SUMMARY IN FINNISH).....	83
	REFERENCES.....	84
	APPENDIX A - LIST OF JOURNALS	92
	APPENDIX B - CODING RESULTS OF THE IDENTIFIED PAPERS.....	96
	APPENDIX C - BASIC DETAILS OF INTERVIEWS	99

1 INTRODUCTION

This chapter explains the background of this dissertation and the relevance of the topic, motivation and purpose of this research. It highlights the research gaps that this dissertation focuses on. This chapter also includes an outline of the dissertation's structure.

1.1 Background and relevance of the topic

The main focus in the application of digital technologies is shifting from engineered innovation to business practices. However, technological solutions do not return almost any value if they are not utilized correctly through BMs to provide and capture value (Chesbrough, 2010). In other words, the technology itself does not provide any value without proper utilization. This is a direct call for BM innovations and transformations.

Literature describes business models (BM) in many ways. One simple way to think of it, is "how companies make money" and naturally that changes over times. Existing literature presents the business model transformation process as a continuously flowing, linear process. We, however, argue that this is not the case. For example, there can be some barriers to BM transformation, especially with incumbent firms. Many different process models, such as lifecycle models and evolution models, are available for use in the BM transformation process. However, many of these models are many times overly complicated for considering and evaluating the BM transformation process, and the existing models can be synthesized as a simple staged model. To address this, we conducted a systematic literature review and used the unified points of view regarding transformation models to develop a three-stage model that we then tested with two case studies.

Business model transformations are mostly studied in the Business Management field but also constantly increasing topic in Information Systems (IS) research. The strong research background from Business Management field can

be also recognized from the reference list of this study but as this is a dissertation for IS, we tried to use as many IS literature sources as possible and take a look for business model transformation from IS perspective. Regardless of large number of studies, there is still no common understanding of why BMs do not change. Technology is one of the most common triggers for BM change (Bucherer et al., 2012). However, a company may still end up in a situation where the BM transformation process is extremely slow or does not progress at all. Existing literature uses terms like inertia, barriers, preventers and inhibitors to describe factors that prevent BM transformation. Factors that block BM transformation are rarely observed, so no generally accepted knowledge has been found or even systematically examined. In general, almost everything—from the terminology used to a mutual understanding regarding why BMs do not change—is widely scattered and is no systematic research has been done from our perspective. We see this as an important research gap in IS literature.

In terms of contribution, there is a crucial need for structured research to provide a deeper understanding of why BMs do not change. As an example, imagine a situation in which a new technologically disruptive innovation becomes available on the market, and two competitive incumbents begin to innovate their existing BMs so that they can benefit and utilize this innovation. One of the companies understands the new technology properly; the company's decision-makers form a consensus as to how to change its current BM and then implement the new model. At the same time, decision-makers at the other company may have lack of understanding or believe to the new technology. They do not develop a mutually cognitive model for their future BM, and changes in their existing BM are prevented by their existing organizational hierarchy, compensation models and rigid processes. The competitive advantage of the first company increases because of the factors that prevent the second company from changing. The technology was available for both of these companies. It was a matter of how the companies chose to utilize it and how they understood, planned and executed their new BM.

In this study, we focus on the problems (different forms of inertia) that incumbent companies might encounter during their BM transformation process. We differentiate between the transformation processes of start-ups and incumbent companies because the transformation process is quite different in newly founded companies (i.e., start-ups). In order to provide such an understanding, we began by synthesizing the available literature. We then conducted two case studies to investigate different types of BM inertia in the transformation process. Based on the insights gathered, we developed a three-stage process conceptual schema for transformation processes that involved identifying and analyzing sources and symptoms of sociocognitive, economic, psychological and sociotechnical inertia. Specifically, we analyzed the process, context and content of a BM transformation and sought to help managers and entrepreneurs understand troubled transformation processes.

1.2 Motivation and purpose of the research

As BM innovations and the ability to reform are key competitive factors, companies cannot afford to waste new opportunities on BM transformation problems. Therefore, it is crucial for practitioners to understand what kind of transformation process they are dealing with and what types of inertia they might face during BM transformations. With this understanding, practitioners could transform their existing business faster, thereby achieving a competitive advantage. For researchers, this study provides a deeper understanding around the urgent need to investigate why BMs might not change even when there is a clear trigger for the change.

Thus, the purpose of this research is to identify potential types of inertia in the BM transformation process of incumbent companies. Our academic contribution is to add one comprehensive point of view to the BM research: factors of inertia in BM transformation. The results of this study will also help business decision-makers to see their own transformation process from the perspective of inertia and most likely to predict potential inertia factors before they even face them. With such an understanding, fostering BM transformation away from the existing BM will be much easier, faster and more effective. In today's fast-paced world of technological disruptions, companies' competitive advantage lies in their capability to innovate their BM and the execution of it.

Our study challenges the current understanding of the literature that companies change their BMs when they encounter an external or internal trigger to do so. The current understanding holds to the illusion that the transformation process is straightforward and smooth. The trigger for BM change could lead to the BM transformation process, but even this does not mean that BMs will change as planned or wanted. Companies face multiple types of inertia coming from multiple sources. These types are not generally examined; this research is likely the first attempt to do so. A number of new research directions for BM transformation research are prosed in this study.

1.3 Structure of the dissertation

This doctoral thesis consists of two major studies. In Chapter 2, the relevant literature is presented and discussed, followed by an overview and explanation of research gaps. This section reveals many individual perspectives of BM transformation but none through the lens of inertia. This led us to build a unified conceptual schema for investigating BM transformation process stages and the inertia factors found in each stage.

The latter part of this thesis focuses on an empirical study. In Chapter 3, we present our methodology and data collection of case studies. Also, an analysis with discussions and a comparison of the case studies is presented later in this part. The last section of this chapter includes conclusion for the case studies and

leads us to discussions in Chapter 4. Chapter 5 discusses the results, contribution, implications for practitioners, limitations of the study, and suggestions for future research, followed by a summary to conclude the research.

This dissertation includes material from two unpublished research papers co-authored by Dr. Eetu Luoma and Prof. Tuure Tuunanen. They are mainly used as commentary on other articles. The use of these articles is the reason why this dissertation is presented in the third person (“we,” “us,” and so on). My role in the literature review was to gather relevant articles by screening, filtering and searching relevant databases, magazines and books. I formed a literature-based understanding of the topic and then, along with Dr. Luoma, wrote an article. In the empirical study, I created an interview-body for actual research, selected two companies, interviewed participants and then again formed a literature- and interview-based body for an article. During both article creation processes, Prof. Tuunanen helped with multiple iteration cycles and helped interpret the feedback from the article reviewers. Without the support of Dr. Eetu Luoma and Prof. Tuure Tuunanen, these articles would not have been completed.

2 LITERATURE REVIEW

Theory related to the topic of this dissertation was drawn from the extant literature on BMs, BM transformation, BM change, inertia factors and transformation processes. This section provides an overview of the current literature in these areas.

Increasing market competition requires organizations to use and improve their BM transformation capabilities (Zott & Amit, 2007; Rai & Tang, 2014). Business model transformation is typically triggered by technological disruptions that may help businesses to exploit new market opportunities (Voelpel et al., 2004; Chesbrough, 2010). This is especially the case when multiple companies have the same capabilities and access to the same technologies (Lucas & Goh, 2009). This means that competitive advantage must be gained from BM innovation rather than technological solutions. A contemporary example of this is the cloud computing technology offered by Microsoft, which has attained a twofold market share compared to its rivals despite Microsoft's fairly standardized technology and the fact that its rivals have vast resources.

Furthermore, value for customers is delivered through technological solutions; the technology itself is not the value received by the customer (Al-Debei & Avison, 2010; Gambardella & McGahan, 2010). The value comes from the way in which technology is utilized to deliver value. Using cloud computing as an example, the essential change in the past decade has occurred not only in technology but also in how information technology (IT) value chains have reorganized and how IT functions and IS are now outsourced (Iyer & Henderson, 2010) from a single software-as-a-service vendor, like Salesforce or Hubspot.

Technology operates as an enabler for change in value generation. We see that BMs, therefore, are needed to highlight how the same technology can be delivered to customers using two or more differing value creation and delivery logics, which produce different value for users and customer organizations (Krantz et al., 2016). Consequently, BMs are a new source of organizational transformation that is complementary to the traditional sources of novelty, such as products, processes and structures (Zott et al., 2011; Foss & Saebi, 2017). One of the major examples of this is the global megatrend of servitization in which

many companies deliver the same value as before but using a consumption-based model. In many cases, servitization is a BM change that leads companies through organizational transformation.

We followed Webster and Watson's (2002) structure in conducting our review but adopted some IS-related practices for the process (described later). The literature review was carried out in accordance with a systematic-mapping type of review (Bandara et al., 2015). It falls under the scoping and integrative reviews described in Pare et al.'s (2015) classification of reviews. That is, this literature review aims to describe the size and nature of the literature available, to classify and synthesize the existing literature and to identify gaps to commission further research by demonstrating what aspects of change in BMs have yet to be studied sufficiently. The review methodology is based on the systematic literature approach, as described by Okoli and Schabram (2010) and Rowe (2014). The approach is divided into four main steps: screening and extracting the relevant literature, organizing the literature, analyzing it and reporting the findings. Two critical considerations include how to identify the relevant literature and how to structure the analysis of the included literature (Webster & Watson, 2002).

The literature defines BM as a description of how a company operates, organizes itself and makes money (Magretta, 2002; Osterwalder et al., 2005; Casadesus-Masanell & Ricart, 2010). In other words, it is a description of the value creation and capture logics (Al-Debei & Avison, 2010; Teece, 2010). Generally, the literature contains many different descriptions of and sets of elements for the BM concept. One example of these is Osterwalder's nine-point decomposition of a BM (Chesbrough, 2010) (Figure 1), which is one of the most popular conceptual schemas, containing nine individual elements. However, the five key elements of a BM can be identified in the existing literature. In the literature, these elements have been modeled for many different business models descriptions and definitions, so we classify these as key elements for our study. These elements are 1) a value proposition, 2) the activities of the company, 3) the resources of the company, 4) a structure describing how the company organizes its activities and resources and 5) a revenue logic describing the structure of the income (Hedman & Kalling, 2003; Osterwalder et al., 2005; Johnson et al., 2008; Al-Debei & Avison, 2010; Demil & Lecocq, 2010; Wirtz et al., 2016).

Based on the perception of the five key elements, BMs are highly related to understanding, learning, describing and visualizing how companies make money. Thus, a BM is also a cognitive conception (Doz & Kosonen, 2010; McGrath, 2010; Velu, 2017; Massa et al., 2017) and an interpretation of the aspects that are relevant to conducting business and their interrelations. While a BM is also described as an activity system that incorporates the tasks accomplished by a firm in order to serve customer needs and to generate profit for the focal firm (Zott & Amit, 2010; Achtenhagen et al., 2013), we argue that the management makes decisions based on the cognitive interpretations of the BM. These interpretations, in turn, have economic implications for the firm (Aspara et al., 2011; Velu, 2017; Massa et al., 2017).

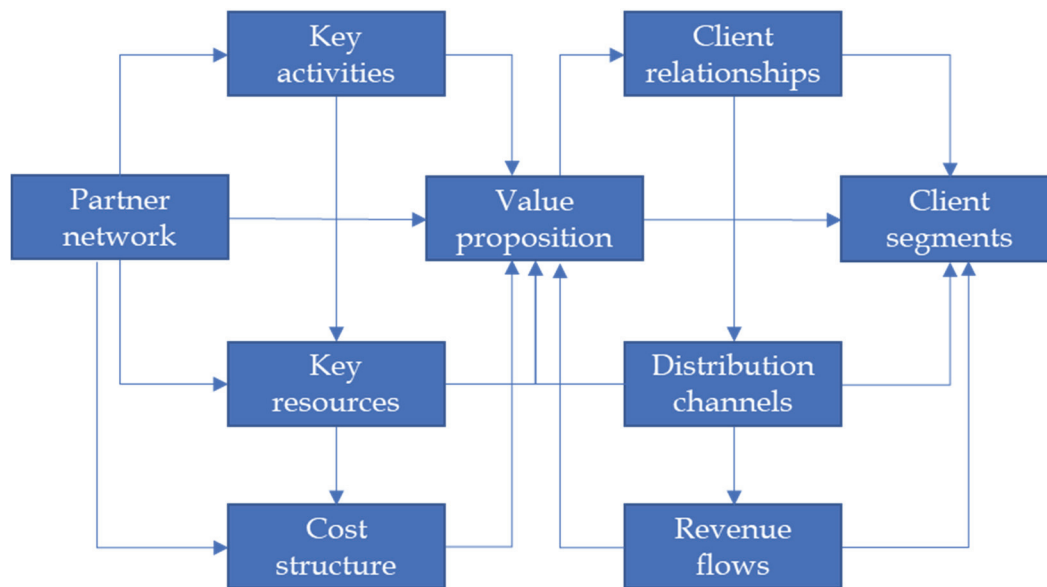


FIGURE 1 Osterwalder's nine-point decomposition of a business model (Chesbrough, 2010).

Furthermore, the BM literature suggests that changes in the BM can often be related to the different lifecycle phases of a business venture (Morris et al., 2005; Ojala, 2016). Business models also have a number of change process steps, from designing to implementing the change (e.g., Pateli & Giaglis, 2005; De Reuver et al., 2009), and different approaches to managing the change (e.g., Sosna et al., 2010; Bohnsack et al., 2014). The literature also suggests that BMs may change in response to both external influences (like regulations, technological innovations and customer needs) and internal influences (like strategic changes) (Demil & Lecocq, 2010; Aspara et al., 2011; Kuk & Jansen, 2013) and that certain capabilities are needed to initiate and execute changes successfully (Achtenhagen et al., 2013; Teece, 2017).

Interestingly, the literature search identified a relatively small number of studies of the dynamic aspects of BMs and BM changes (Foss & Saebi, 2017). Dynamic aspects involve seeing BMs as a set of elements that impact and influence one another dynamically and evolve over time. Instead of a dynamic point of view, the literature focuses more on the static aspects and attempts to define the BM concept (Wirtz et al., 2016). The static view can be imagined as an ongoing BM without evolving integrity. Pateli & Giaglis (2004) and Osterwalder and Pigneur (2013) have called for research into the dynamic aspects of BMs. They argue that research in the IS field is well suited to forming a view of the processes for developing and changing BMs.

However, compared to the static view, the reasons as to why changes occur in BMs and the mechanisms by which these changes occur are seemingly scattered and inconsistent in the extant literature. Without a comprehensive understanding of BM changes, dynamics in BMs may break during the change process, and companies may end up with a non-functional BM. Explorations of

the literature on BM changes may provide researchers and practitioners with varying and perhaps even incompatible views on understanding and carrying out BM changes.

The current literature contains many different patterns for BM change. Many of these transformation models are multi-step and multidimensional but still straightforward and clearly progressive processes, with no problems. This potential fallacy is mostly due to the explanations of the circumstances before and after the change (e.g., Antero et al., 2013; Ghessi et al., 2015; Clohessy et al., 2016) but not during the transformation. We assume that when only the circumstances before and after a transformation process are described, this produces a potentially incorrect illustration of the entire process as phases, obstacles and other factors remain hidden. Furthermore, when depicting a successful case of BM change (e.g., Ojala, 2016; Teece, 2017), there is an illusion of a regular, successive progression of the change process steps. In practice, this means a situation in which a transformation process contains, for example, five individual steps, and moving from one step to the next is considered automatic and easy progress with no obstacles to prevent this change from occurring.

In contrast, the emphasis of our literature review and the resulting synthesis is on troubled BM transformations. By troubled BM transformations, we refer to cases in which the change process does not advance at all, advances in an unintended manner, or produces unintended results. Understanding the needed drivers, inhibitors and inertia as well as the integrative model of the change process can help managers, entrepreneurs and scholars to diagnose troubled BM changes and apply appropriate interventions. For practitioners, the findings of this study can assist firms in designing and changing different aspects of their BMs and communicating these changes to their customers and stakeholders.

We recognize that the need to understand how different factors affect BMs is still partially unfulfilled. We, therefore, argue for more research on how dynamic BM change is induced by technology. Our objective, thus, is to integrate the scattered knowledge of the dynamic aspects of the BMs, the reasons for changes in the models and the activities related to changing the model. We apply organizational transformation (Pettigrew, 1987; Gersick, 1991; Lyytinen & Newman, 2008; Besson & Rowe, 2012) as our basis in mapping the literature as it provides a way to categorize problems related to BM change into three different classes of transformation: process, context and content.

In reporting the literature review, we conform to the reporting structure suggested by Webster and Watson (2002). We next present our systematic method for reviewing the literature. We then analyze the identified literature according to specific research questions and synthesize the results into an integrative view, more specifically, a process model for BM transformation. Finally, we discuss the implications of our work for both research and practice and form a conclusion.

2.1 Identifying the literature

The systematic screening method applied in this review followed the steps described by Okoli and Schabram (2010) and Rowe (2014). Screening began with the establishment of the objective of the literature review and the research question and was followed by the development of a protocol for searching and screening the relevant literature. Subsequently, a search for the literature and systematic filtering were performed based on the developed protocol.

Choosing an appropriate review protocol required us to study the most cited articles about the topic first. Two observations were immediately made. First, changes in BMs appeared to be studied in several different research domains, and an interdisciplinary review was needed to achieve a comprehensive view of the literature. Second, while the definition and the key elements of a BM were seemingly consistent, terms associated with the BM changes, such as BM transformation and BM evolution, were used confusingly and inconsistently.

To define the relevant keywords for our search and to filter applicable works in the literature, we had to agree on a definition of BM and the terms associated with BM change. Our synthesis of BM concepts is presented later in Table 1. Aligned with the literature (Chesbrough & Rosenbloom, 2002; Al-Debei & Avison, 2010, Demil & Lecocq, 2010), we defined BM as a multilevel, granular, cognitive and convergent model of how a company generates and captures value. This means that a BM is not an isolated aspect of business, such as a value proposition or revenue logic; instead, it is a configuration of multiple elements. We advance a set of five main BM elements: value proposition, activities, structure, resources and revenue logic (Hedman & Kalling, 2003; Osterwalder et al., 2005; Johnson et al., 2008; Al-Debei & Avison, 2010, Demil & Lecocq, 2010; Wirtz et al., 2016).

However, there are scenarios in which this set of elements must be adapted for specific businesses. Practitioners who engage in developing BMs may choose the elements needed to describe and interpret the business on a case-by-case basis, depending on the aspect of business to be modeled and the level of granularity required for the BM development at hand. Therefore, we suggest that the five elements listed above are essential for considering cognitive BMs (Aspara et al., 2011; Velu, 2017).

Finally, through congruence, we denote that a firm's structural aspects are and, in our opinion, should be aligned with the elements of the firm's BM and its partners and customers. Otherwise, the chosen BM with all its elements may not be fully aligned with the needs of external environment and business landscape. Thus, the benefits of operating on a BM level may be lost.

TABLE 1 Business model concepts.

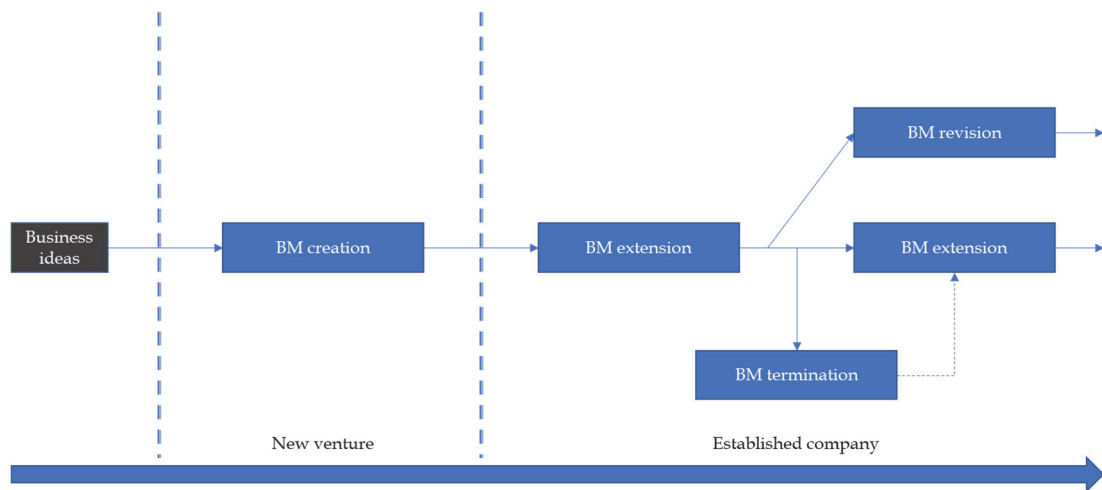
Concept	Definition	Source
Cognitive BM	A BM is a business decision-maker's interpretation of the relevant resources, transactions and value structures of a firm in a coherent and viable configuration. A BM is used by executives and entrepreneurs to understand and change the value proposition, activities, resources, structure and revenue logic of a firm.	Al-Debei and Avison (2010), Demil and Lecocq (2010), Casadesus-Masanell and Ricart (2010), George and Bock (2011) and Velu (2017)
Economic BM	A BM represents an economic manifestation of the resources, transactions and value structures of a firm in a coherent and viable configuration. The actors of the firm execute the BM to generate and appropriate value.	Al-Debei and Avison (2010), Demil and Lecocq (2010), Casadesus-Masanell and Ricart (2010), George and Bock (2011) and Velu (2017)
BM innovation	BM innovation refers to "designed, novel, and nontrivial changes to the key elements of a firm's BM and/or the architecture linking these elements." The term denotes the content and outcome of the BM changes, especially in cases in which revision produces desired and beneficial outcomes in terms of fit and performance.	Foss and Saebi (2017)
BM lifecycle	A BM lifecycle consists of the creation of new BMs (i.e., new firms), periods of revision and extension and the termination of BMs.	Morris et al. (2005), Kindström (2010) and Cavalcante et al. (2011)
BM evolution	BM evolution refers to "A fine-tuning process involving voluntary and emergent changes in and between permanently linked core components." This involves ongoing minor changes between major BM transformations and the process of searching for new BMs through a trial-and-error approach.	Demil and Lecocq (2010) and Sosna et al. (2010)
BM transformation	A holistic, systemic and time-limited process introduced to bring about major changes in cognitive and economic BMs. Such changes include replacing or extending resources, transactive structures and value structures to improve the fit and performance of the overall BM under the contextual factors driving or restraining the change.	Aspara et al. (2011) and Aspara et al. (2013)

Note. BM = business model.

The dynamic dimension of a BM refers to how the cognitive and economic views of an organization change and adapt over time. In other words, the dynamic dimension considers how the managers' interpretations and decisions, as well as the progression on the operational level, modify the elements of a firm's BM over time. Based on a recent analysis by Foss and Saebi (2017), the term "BM innovation" stresses the innovative end state as the reason for a change and as the basis for the illustration of the change, which emphasizes the teleological perspective regarding the change (van de Ven and Poole, 1995). However, occasionally, accounts of innovation also examine the process of changing the BM elements and the firm's business logic (e.g., Bucherer et al., 2012).

Changes in a BM are also expressed via the lifecycle of the BM (see Figure 2) and the focal firm (e.g., Morris et al., 2005; Cavalcante et al., 2011). The BM continuously evolves (see Figure 3) to adapt to and align with external and internal forces (reassessments) (e.g., Demil & Lecocq, 2010; Ojala, 2016) and as more radical transformations occur in which the BM elements are replaced altogether (Voelpel et al., 2004; Aspara et al., 2013). In addition, prior studies illustrate and depict BM generation (Osterwalder and Pigneur, 2010), BM renewal (Doz & Kosonen, 2010), BM transition (Kindström, 2010) and BM modification (Demil & Lecocq, 2010).

In summary, the extant literature explains BM change (or dynamics) as the factors that stimulate change within a cognitive and economic BM, as a process of change and as the outcomes or impact of the change process. Moreover, the literature review revealed an appropriate set of keywords, consisting of BM paired one of the following: change, evolution, transformation, generation, renewal, transition, modification, impact and innovation.



Note. BM = business model.

FIGURE 2 Adapted model for business model change (Cavalcante et al., 2011).

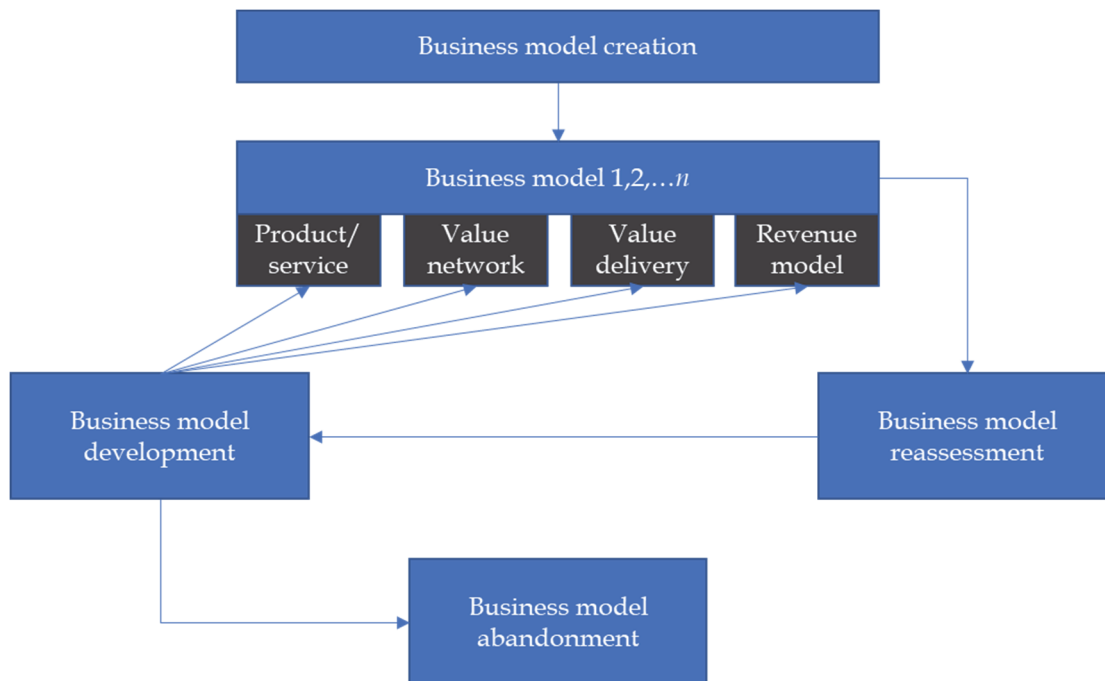


FIGURE 3 Adapted theory of business model creation and evolution (Ojala, 2016).

Our selection of the leading journals was based on available articles identifying and discussing journals relevant to IS research (Hardgrave & Walstrom, 1997; Peffers and Ya, 2003; Willcocks et al., 2008). We noticed that Peffers and Ya (2003) provided a comprehensive and interdisciplinary list. We chose it as a basis, cross-checked it and combined it with the lists of top IS conferences presented by Hardgrave and Walstrom (1997) and Willcocks et al. (2008). By combining these lists, we determined the leading IS journals and conferences relevant to our study (see Appendix A for details).

The keyword search targeting the list of journals was conducted on September 14, 2017, through the Scopus abstract and citation database. Our search produced 1470 articles. Two researchers read the abstracts to screen the articles for inclusion in the review, which resulted in the inclusion of 112 articles. They then read the articles to perform a quality appraisal procedure (Okoli & Schabram, 2010). In both phases, the articles were filtered based on specific criteria for relevance. First and foremost, an article needed to contribute to the objectives of the study. These criteria led us to exclude many articles concerning BM innovations in which the change or the impact of the change was considered by comparing prior and subsequent BMs; we also excluded articles that described several successive models. Because of our focus on objectives, we also excluded articles that described or compared innovative BMs (e.g., Feller et al., 2011; Giessmann & Stanoevska-Slabeva, 2012) and articles on the development of model-driven systems in which a BM denotes a description of a business domain (e.g., Xiao and Greer, 2007). Second, a selected article needed to include a conceptualization of a BM as a configuration of elements. Introducing these criteria led the exclusion of articles that covered one aspect of business (e.g.,

Pauwels & Weiss, 2008; Jetter et al., 2009) and articles that were missing conceptualizations altogether (e.g., Giesen, 2010). Third, we removed literature reviews about BMs and BM changes from the analysis but performed reverse searches by reviewing their citations. Five relevant articles, which also conformed to the two main criteria, were found and included in the survey.

After two rounds of filtering the articles of inclusion and checking for quality, we arrived at 58 articles relevant to our review. We carefully documented the selection of the literature and the reasons why an individual article was included based on the above criteria. We continued the analysis by applying coding based on our synthesis of the organizational transformation theories of the list papers. The coding procedure involved one author providing the initial codes, which were then reviewed together. After presenting and reviewing the initial coding, the authors agreed on the coding of the articles. This approach was selected to avoid inter-coder reliability issues. Comparing the initial and agreed upon coding, we calculated the overall percentage of agreement to be 83.8 percent between rounds. The difference is largely explained by the more accurate coding of the conceptual-analytical studies in the identified list of relevant articles. Finally, the 58 selected articles were analyzed and synthesized against the specific research questions introduced below.

2.2 Structuring the review

Previous literature reviews of changes in BMs (Schneider & Spieth, 2013; Spieth et al., 2014; Foss & Saebi, 2017) have not considered existing theories in their literary classifications. In order to unify existing knowledge, we chose to use existing information as a basis for classifications. In this literature review, the transformation of the BM is seen as an organizational transformation because the change can be seen not only as a change in the cognitive model but also as a change in the company's economic activity. Our choice to use existing theories as lenses for the review was supported by Besson and Rowe (2012), who see studies in organizational transformation as the basis for understanding the nature and systemic effects of IT innovations and the digitalization of business. Additionally, as Besson and Rowe (2012) point out, these lenses have been applied and utilized within the IS literature in several studies to discuss the interconnections and dynamics between technology, organization and business (e.g., Chatfield & Bjorn Andersen, 1997; Chatterjee et al., 2002; Mithas et al., 2011). We envisioned that such utilization would give us the best possible answer to our research questions.

Organizational change frameworks, therefore, provide several opportunities to structure BM literature, for example, through contingency frameworks (Miles and Snow, 1984), punctuated equilibrium models (Gersick, 1991) and evolutionary frames (Hannan & Freeman, 1984). Pettigrew (1987). Lyytinen and Newman (2008) described organizational change as a rich and complex phenomenon that should be looked at by examining multilevel systems (content), reviewing the steps included in the change (process) and determining

the factors driving the change (context). We organized our review and the literature according to the basic elements of organizational transformation, as shown in Table 2.

TABLE 2 Organization of the review and literature (adapted from Pettigrew, 1987).

Organization transformation	BM transformation perspectives	Guiding questions for review
Process	<ul style="list-style-type: none"> - Horizontal transformation process stages - Vertical layers: cognitive and economic 	What are the stages of the change process in the BM, and in what ways can the steps be taken?
Context	<ul style="list-style-type: none"> - Exogenous opportunities and uncertainties - Endogenous drivers and inhibitors 	What factors enable and drive a change in the BM, and what factors can prevent and hinder the change?
Content	<ul style="list-style-type: none"> - Alignment of BM with the environment - Alignment of the elements in a BM - Improving economic performance through fit 	What are the desired and unwanted effects of a change in the BM?

Note. BM = business model.

First, we focused on processual analysis by mapping and integrating a clear and comprehensive description of a change and the related challenges in the BM of a firm. We assumed that established companies were more likely to change their BMs infrequently due to the resources and capabilities that are slow and costly to develop. Following Gersick's (1991) and Lyytinen and Newman's (2008) views of punctuated organizational transformation, we perceived changes in established firms' BMs as a comprehensive system that is more than just the sum of BMs' elements (holistic), systemic and time-limited transformations.

Accordingly, from the literature, we identified the horizontal transformation process stages in which the change is initiated as a result of external triggers and conditions in which the change is implemented and the BM is stabilized in the operational BM stage. Whereas a planned and punctuated change appropriately represents the overall change process in a firm's BM, it may fall short of capturing the details of the search for a new BM after the decision to transform the BM has been made. As an example of such a horizontal transformation process, Pateli and Giaglis (2005) describe a scenario-based three-stage transformation model that starts with understanding existing BMs, proceeds through technology's influence stage, and ends with an evaluation of upcoming change (see Figure 4 later in this Section). This is just one example of how external triggers and conditions may launch a comprehensive BM transformation process without taking additional factors into account.

We assume that there are a lot of additional factors involved in the process from the decision to transform to the completion of the transformation. According to Hannan and Freeman (1984) and Orlikowski (1996), due to the

complexity of BM changes, it is unlikely that the realization of a new BM would be exactly as originally intended. Rather, the fit between the BM and the environment requires learning and a series of adaptations and alterations. That is why the transformation includes an evolutionary search for a successful BM.

Furthermore, whereas a cognitive model can be changed easily and frequently, an economic BM requires that resources be mobilized and that actors execute the intended BM through their internal and external interactions. Based on Barley and Tolbert (1997) and Avgerou (2000), we suggest that, after a suitable cognitive BM is found, it needs to be institutionalized as an accepted way of executing the economic BM. By institutionalizing, we mean the actual implementation when the cognitive BM turns, for example, into practices, culture and daily operations through which it starts to form an economic BM. We further suggest that the processual analysis should, therefore, include a stage for implementing changes in the economic BM.

Accordingly, we analyzed the identified literature to understand the horizontal process stages for sensing a change, designing the change, implementing the change, establishing a new BM and stabilizing the BM. Regarding the vertical levels of a processual analysis, we acknowledged Pettigrew's (1987) process of separating actor- and system-level analyses as well as analyzing both abstract structures and definite conduct. Lyytinen and Newman (2008), in addition, suggest separating a working system that executes information-related work and a building system that enacts the changes. To be consistent with these views, we distinguished between analyses of the cognitive BM on the managerial level and on the level of executing the economic BM. As the main focus of our research was to examine different forms of inertia during the transformation, we decided to first divide the entire change process into individual stages. Thus, the first guiding question was as follows:

GQ1 What are the stages of the process of change in the BM and how do these stages align?

Second, we focused on contextual drivers of change that describe the triggers of or the pressure on a BM change originating from the external context of a firm; we also focused on organizational change motors that operate within a firm and either drive or slow change (Pettigrew, 1987; Lyytinen & Newman, 2008). The external context covers newly available technologies (Chesbrough & Rosenbloom, 2002; Casadesus-Masanell & Ricart, 2010), pressure from competitive environments (Amit & Zott, 2001; Demil & Lecocq, 2010) and other environmental changes, such as macroeconomic or political changes (Tankhiwale, 2009). These can be seen either as opportunities or threats in terms of developing and changing a BM when they are reflected against the company's resources.

Internal organization-level factors that drive or slow a BM change can be classified into available resources (Morris et al., 2005; Demil & Lecocq, 2010) and capabilities (Pateli & Giaglis, 2005; Teece, 2017) or lack thereof. Regarding the organization-level factors, we also identified sources of organizational inertia (Besson & Rowe, 2012) as well as management models and organizational culture that drive change.

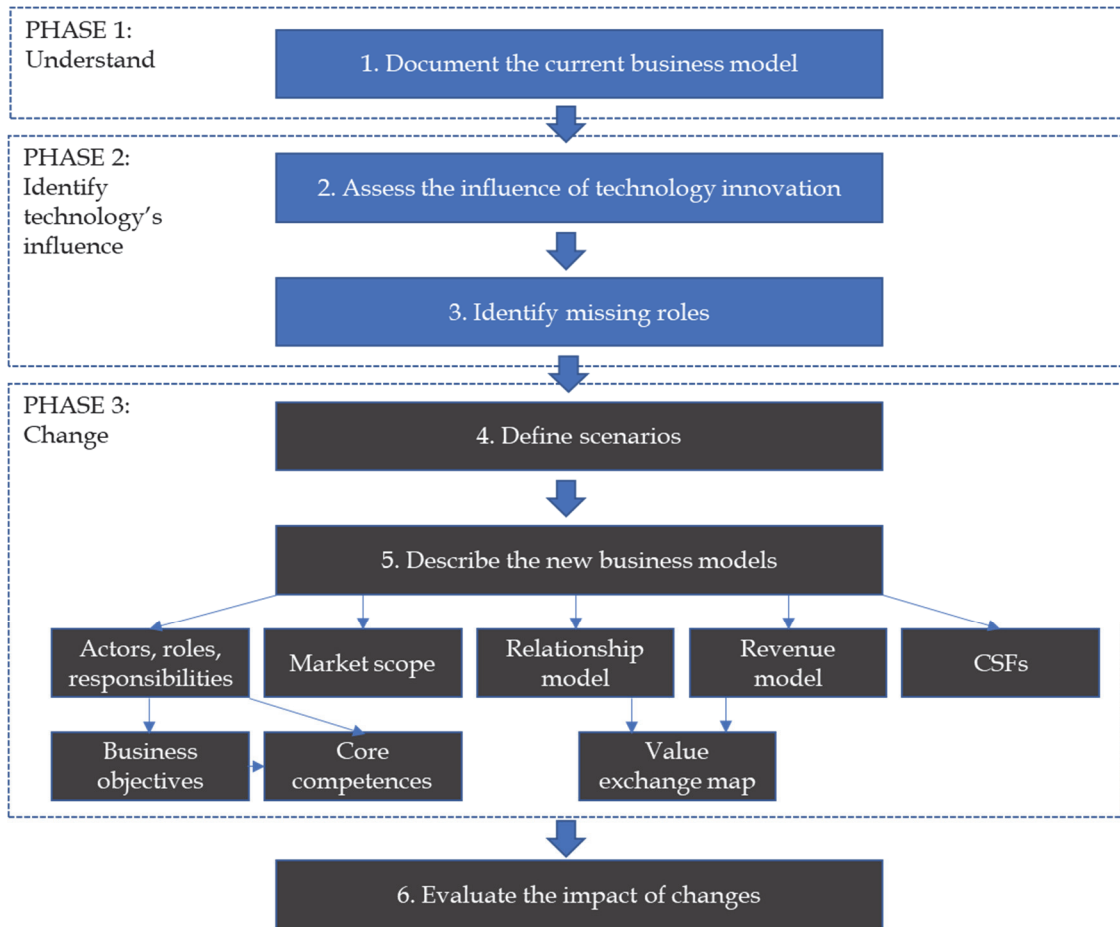


FIGURE 4 Scenario-based methodology for business model change (Pateli & Giaglis, 2005).

Internal individual-level factors include managerial abilities (Aspara et al., 2013) and individual propensities (Cule & Robey, 2004) or lack thereof. Because our goals were to understand the factors that promote change in the BM and to help diagnose problematic changes, the second guiding question of the analysis addressed both aspects:

GQ2 What factors enable and drive change in a BM and what factors prevent and hinder that change?

Third, our analysis looked at the content of a BM change and the BM's ability to describe the origins and outcome of the change in a generalizable way in order to generate comparable results among companies. Based on our review, we suggest that firms seek to align their activities with external environmental conditions (Miles & Snow, 1984), such as customer demand and competition, as well as to find the fit between the structural elements of their BMs (Siggelkow, 2002; Lyytinen & Newman, 2008), especially in terms of economic BMs. Therefore, we focused on analyzing the extent to which extant literature captures the alignment or misalignment of the BM with the firm's environmental factors and the fit or misfit between the BM elements. We found that these qualities may

explain the consequences of BM change as well as the dynamics between BM elements. Thus, we defined the third guiding question as follows:

GQ3 *What are the desired and unwanted effects of a change in a BM?*

2.3 Analysis

Our method resulted in the identification of 58 articles, covering the years 2004–2017, published in 24 journals and three IS conferences. We coded the articles according to their consideration of external and internal contexts, their horizontal process stages and vertical layers and their outcomes (cf. Appendix B). In the following section, we present the results of the analysis of the identified literature, structured according to our specific research questions.

2.3.1 Process of business model transformation

We considered 32 articles that focused on the process of BM transformation. Based on our review of organizational transformation theories, we expected to find descriptions of minor adaptations as well as narratives and normative models about sensing, designing, implementing and establishing a change in planned transformations. Our coding suggested several accounts of sensing and deciding to initiate the change, indicating an ongoing process of identifying and recognizing the reasons and need for change. Also designing and testing in a proper way in order to implement the decided change. All these stages are elaborated on later in this section.

In contrast, only a few of the identified empirical articles considered institutionalizing the change (Cule & Robey, 2004; Sosna et al., 2010; Bucherer et al., 2012) or actions in the stable stage (Moyon & Lecocq, 2010; Sosna et al., 2010). In fact, our analysis of the BM literature led to the conclusion that, after implementing and institutionalizing changes in the BM, the focal firm proceeds by sensing the environment for new contextual developments. We also noticed that designing BMs is an activity in both the initiating stage (Bucherer et al., 2012; Andries et al., 2013) and recursive experiments to find new cognitive and economic BMs (Chesbrough, 2010; Martins et al., 2015; Kranz et al., 2016). Each of these individual steps is clearly intended for a specific purpose, and each can be examined separately. This idea of treating the transformation process in simple stages allowed us to consider individual phases for a specific purpose, which is one of the main reasons for using stage models (Karjalainen et al., 2020). We, therefore, regarded designing as a task within the stages. Our analysis detected tasks for three stages of the BM transformation process, as summarized in Table 3. The column “Total” contains the number of articles where particular stage was clearly identified.

The identified literature generally described the sensing stage as being concerned with recognizing the market signals for opportunities to create value

(Voelpel et al., 2004; Voelpel et al., 2005; Aspara et al., 2011; Bucherer et al., 2012; Frankenberger et al., 2013; Kranz et al., 2016; Teece, 2017). Executives also need to identify the impact of new technologies (Pateli & Giaglis, 2005) and understand the needs of the stakeholders (Frankenberger et al., 2013). The identification of opportunities leads to the evaluation of viable alternative BMs and courses of action (Bucherer et al., 2012; Andries et al., 2013; Aspara et al., 2013; Berends et al., 2016; Ojala, 2016; Remane et al., 2017). We found that this stage also involved assessing which assumptions and practices of the old BM should be discarded and unlearned (Cule & Robey, 2004; Frankenberger et al., 2013; Mehrizi & Lashkarbolouki, 2016).

The analysis of the literature also indicated an emphasis on developing cognitive BMs. Some authors stress the integration of knowledge (Sosna et al., 2010) and holistic reflections of the logics of business (Mehrizi & Lashkarbolouki, 2016). Others imply that the transformation is set in motion through the conceptualization of a BM (De Reuver et al., 2009; Kranz et al., 2016). This stage results in decisions and communications regarding the new BM and courses of action (Cule & Robey, 2004; Sosna et al., 2010).

TABLE 3 Process stages of business model transformation.

Stage	Definition	Total
Sensing	Sensing is the first stage. It is an ongoing activity to monitor the environment and tasks for analyzing market signals and technological developments. It is a stage for conceiving alternative cognitive BMs and making decisions about BM renewal.	16 articles
Searching	Searching is a stage for generating assumptions about new cognitive BMs. It is for planning, designing and executing experiments with economic BMs. It is also for collecting feedback to test and revise the assumptions about cognitive BMs in order to arrive at new, viable and profitable economic BMs.	32 articles
Implementing	Implementing is a stage for transferring knowledge about the new cognitive and economic BMs to the whole organization and for standardizing the execution of the BM across the organization.	4 articles

Note. BM = business model.

The searching stage involves undertaking experimentation and trial-and-error learning to develop a new cognitive and economic BM (Dunford et al., 2010; Yunus et al., 2010; Sosna et al., 2010; Frankenberger et al., 2013; Martins et al., 2015). Berends et al. (2016) present how the search for a BM is perceived in the literature: "Experimentation entails purposeful actions to learn: planning, designing, and executing relatively controlled situations to develop new knowledge and validate existing forms." The predominant approach to carrying

out experiments in practice seems to be a parallel launch of the new BM with the prevalent model (Bucherer et al., 2012).

The cognitive model is augmented in the searching stage by the generation and testing of assumptions (Voelpel et al., 2005; Chesbrough, 2010; McGrath, 2010). The key tasks involve improving the understanding of how the operations are associated with performance (Bouwman et al., 2016; Cosenz & Noto, 2017), processing feedback from experiments and redefining the cognitive model based on the experiences and information gathered (Chesbrough, 2010; Sosna et al., 2010; Andries et al., 2013; Martins et al., 2015; Kranz et al., 2016). In this stage, cognitive models and their underlying operations are visualized, communicated and debated (Pateli & Giaglis, 2005; Chesbrough, 2010; Kindström, 2010). According to the literature, the search for a new cognitive BM results in the notable redesign of the BM configuration, integrating all pieces of the new BM (Voelpel et al., 2004; Johnson et al., 2008; Frankenberger et al., 2013; Remane et al., 2017; Teece, 2017).

Searching for new economic BMs requires the commitment of resources, the development of competencies and the actual realization of new or adapted BM components (Morris et al., 2005; Berends et al., 2016; Teece, 2017). It also requires firms to invest in new technologies and roll out technologies that support BMs (De Reuver et al., 2008; Kamoun, 2008), to develop products that match the technological evolution and market needs (Ojala, 2016) and to test the interaction between BM elements in practice (Chesbrough, 2010). Experimenting with economic BMs involves trying out alternative BMs with real customers (De Reuver et al., 2009; Chesbrough, 2010) and implementing various adaptations to align new BMs with business environments (Cavalcante et al., 2011). The experiments and managers leading the changes in their organizations result in the establishment of new viable economic BMs (Cule & Robey, 2004; Chesbrough, 2010).

The identified literature best describes the implementation stage of a new BM in an organization as exploitation following exploration (Dunford et al., 2010). This stage involves an organization transferring the knowledge attained during its search to the whole organization (Sosna et al., 2010) and standardizing the execution of the economic BM across the organization to support the successful model discovered in the preceding stage (Cule & Robey, 2004; Sosna et al., 2010; Teece, 2017). Finally, the literature suggests that executives and entrepreneurs should manage the exploitation of the new BM (Sosna et al., 2010; Dunford et al., 2010; Bucherer et al., 2012) – which, in our thinking, refers to executing the new profitable economic BM. Finally, few sources in the identified literature advocate employing change management practices in BM transformation, such as persuading internal and external actors of the need for change (Kamoun, 2008; Lucas & Goh, 2009) and building employee commitment to the change (Kindström, 2010; Achtenhagen et al., 2013). In conclusion, our analysis of the BM transformation process is summarized in the following proposition:

Proposition A1. *The transformation of a BM includes the process stages of sensing the need for a new BM, searching for it and implementing it, with the focus shifting from developing a cognitive BM to developing an economic BM as the process advances.*

Propositions that begin with the letter A (e.g. A1) apply to the first part of this study, meaning this literature review. Propositions at a later stage, those beginning with the letter B (e.g. B1) are related to the empirical part of our research.

2.3.2 Context of business model transformation

Our analysis of the literature led us to confirm that, by and large, changes in customer demand, competition, economies and new technologies are the contextual drivers that provoke managerial actions. These drivers do not trigger change spontaneously, but the ability to identify technology-push and market-pull pressures is needed (Kindström, 2010; Wirtz et al., 2010; Lin & Hsia, 2011; Bucherer et al., 2012). The contextual drivers are also seen as a source of uncertainty; it is difficult to predict a priori how technologies or markets will evolve (Andries et al., 2013), whether the BM will succeed and how competitors and other actors will respond to the changes in the BM (Berends et al., 2016; Björkdahl, 2009). In addition, 14 of the 40 mapped articles discuss the firm's internal context as the driver of BM transformation. The firm's internal context is seen here as a combination of technical, human and process resources and business capabilities (Brink & Holmén, 2009; Kuk & Jansen, 2013; Rai & Tang, 2014).

Consequently, management's competency in detecting and understanding the contextual changes and forming a vision for change is essential (Williamson, 2010; Yunus et al., 2010; Sitoh et al., 2013; Teece, 2017; Velu, 2017). Strategic awareness (Vlaar et al., 2005; Doz & Kosonen, 2010), the capacity to absorb new knowledge (Al Humaidan & Sabatier, 2017) and personal networks (Wang et al., 2017) enable executives to recognize possibilities for value creation and threats in competitive erosion (Voelpel et al., 2005; Aspara et al., 2011). The identified literature also stresses decision-making capability as a driver (Wang et al., 2017) as well as an inhibitor (Aspara et al., 2011) of change in BMs. That is, management is required to reach a consensus about the cognitive BM (Smith et al., 2010; Aspara et al., 2013), integrate technology with it (Lehoux et al., 2014), avoid the stagnation originating in routines and commit to the existing BM (Voelpel et al., 2004; Cavalcante et al., 2011; Kranz et al., 2016).

One of the most comprehensive views of challenges in BM transformation is Cavalcante and other's (2017) work on key challenges in different types of BM changes (Figure 5). In the identified literature, we found several potential drivers and inhibitors related to a firm's dynamic capabilities. Dynamic capabilities are defined as the internal ability to reconfigure and build new resources and capabilities (Doz & Kosonen, 2010; Basile & Faraci, 2015; Velu, 2017). This is needed for the renewal of cognitive BMs (Kranz et al., 2016) and to acquire and redeploy resources to enact changes in economic BMs (Lin and Hsia, 2011; Teece,

2017). First, since it was discovered that new BMs require the testing of assumptions associated with cognitive BMs, many researchers have embraced the need for organizational culture for experimentation (Chesbrough, 2010; Dunford et al., 2010; McGrath, 2010; Svejenova et al., 2010; Achtenhagen et al., 2013; Martins et al., 2015; Teece, 2017). This is seen as important for overcoming the problems associated with the fear of the negative consequences of change(s) to the existing BM while exploring a new BM (Sosna et al., 2010; Cavalcante et al., 2011; Kranz et al., 2016; Mehrizi & Lashkarbolouki, 2016; Velu, 2017). Second, having control of, developing, maintaining and mobilizing resources is necessary to force changes in economic BMs (Kamoun, 2008; Rai & Tang, 2014; Velu, 2017; Wang et al., 2017).

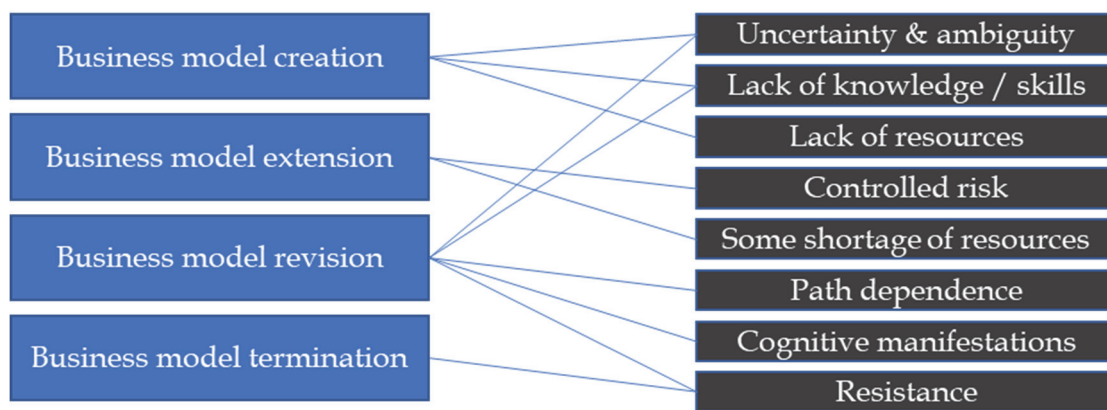


FIGURE 5 Key challenges in different types of business model change (adapted from Cavalcante et al., 2017).

Furthermore, we identified several insights into the internal friction or inertia of BM change, which can be classified as originating from managerial cognitions as well as the economic and internal firm context. Cognitive inertia typically stems from existing business logics or from a reluctance to invest in refining and extending an existing BM. It can result in misunderstandings and biased perceptions of opportunities and threats, leading to the filtering and suppression of new ideas (Voelpel et al., 2004; Sosna et al., 2010; Bohnsack et al., 2014; Berends et al., 2016; Mehrizi & Lashkarbolouki, 2016). Otherwise, the cause of inertia can also be a lack of knowledge (Bucherer et al., 2012) or the mere inability to imagine, understand and conceive a superior BM (Chesbrough, 2010; Bucherer et al., 2012).

Economic inertia, in turn, predominantly arises from investments in existing capabilities and resources, from existing contractual relationships and from the simultaneous execution of the current BM (Vlaar et al., 2005; Voelpel et al., 2005; Williamson, 2010; Mehrizi & Lashkarbolouki, 2016). Economic inertia often causes the actors to protect and improve their old cognitive and economic BMs and the disinclination to unlearn the current BM (Johnson et al., 2008; Mehrizi & Lashkarbolouki, 2016).

The literature also reports various other causes and consequences of general change resistance. These stem from the internal context with “multiple cognitive, structural, cultural and political dependences on the existing BM” (Mehrizi & Lashkarbolouki, 2016, p.298). The main causes include prevailing routines and beliefs (Vlaar et al., 2005; Sosna et al., 2010), the rigidity of employees (Lucas & Goh, 2009; Bucherer et al., 2012), conflicts of interest and power (Bucherer et al., 2012; Berends et al., 2016) and unfamiliarity with the benefits of new BMs (Bucherer et al., 2012). The ramifications of these inertial forces include a general lack of willingness and social groups’ opposition to BM transformation initiatives (Cule & Robey, 2004).

We considered 40 articles focusing on the contextual drivers and inhibitors of BM transformation. Our analysis is summarized in the following propositions:

Proposition A2. *Contextual drivers for BM transformation include technical and economic developments in the focal firm’s environment, the availability of resources and dynamic capabilities and the management’s change management abilities.*

Proposition A3. *The contextual inhibitors of BM transformation include external technical and economic uncertainties; a lack of resources and capabilities; the internal inability to detect and decide on responses to external changes, resulting in cognitive and economic inertia; and a rigid organizational culture that disallows experimentation.*

2.3.3 Content of business model transformation

Business models can be considered holistic by definition as the concept connects value creation, value capture and all other BM elements together (Al-Debei & Avison, 2010; Sitoh et al., 2013). The literature offers several suggestions as to what “fit” or “alignment” means for BMs and why achieving congruence is the principal objective of BM transformation. A fit and aligned BM consists of a logical set of supporting and reinforcing elements (Morris et al., 2005; Berends et al., 2016). For instance, an inside sales model is a suitable choice when the BM is aimed at a low marginal cost per customer and a low-cost value proposition. However, when one begins to travel to meet customers, the personal sales model begins to generate extra costs and thus creates a misfit or conflicting implications for other BM elements (Lehoux et al., 2014; Berends et al., 2016). A BM innovation, therefore, is likely to involve changes to multiple elements; the alignment view means that outcomes depend on whether the BM elements reinforce one another following the BM transformation (Demil & Lecocq, 2010; Casadesus-Masanell & Ricart, 2010; Berends et al., 2016). The configuration and fit of the BM elements may result in an increase or decrease in the firm’s economic performance (Johnson et al., 2008; Demil & Lecocq, 2010; Rai & Tang, 2014).

The identified literature points out that a BM can achieve fit in several ways. First, a BM achieves external fit when it is aligned with the market conditions, technological opportunities, regulatory environment, competition and, most importantly, customer demand (Voelpel et al., 2004; Morris et al., 2005; Kamoun, 2008; Björkdahl, 2009; Frankenberger et al., 2013; Bouwman et al., 2016). Second, the BM achieves internal fit when the model’s elements are aligned consistently

(Morris et al., 2005; Frankenberger et al., 2013). Finally, the BM may also exhibit fit if it is consistently aligned with the firm's management model and strategic objectives (Basile & Faraci, 2015; Teece, 2017), the technology that the firm employs and the technology embedded in the BM's value proposition (Kuk & Janssen, 2013, Teece, 2017). Conversely, a BM evolution or BM transformation may result in a misfit between the external and internal factors. In this setting, we define a BM transformation as troubled when this produces unintended results in the form of misaligned BM elements.

Berends et al. (2016) suggest that misalignments between BMs and the external and internal factors arise due to the complexity of these models, as several elements and interactions must be considered. Finding an optimal BM is a challenging managerial undertaking both cognitively and in terms of the economic BM, especially when simultaneously running the existing BM and developing a new BM (Berends et al., 2016). However, according to the literature, the prime reason for a BM misfit has to do with permanent changes to the economic BM. Demil and Lecocq (2010) propose that the BM evolves incrementally even without planned BM transformations, as sequences of minor adaptations. Minor adaptations may preserve the fit and reinforce a successful model, but they may also result in misalignments. Some can be fixed via managerial decisions (Demil & Lecocq, 2010), but some may require BM transformations.

We considered 15 articles focusing on the content of BM transformation. Our analysis of BM transformation is summarized in the following proposition:

Proposition A4. *A BM transformation should ensure that the BM is externally aligned with customer needs, technological capabilities and the firm's strategic objectives, and that the BM elements internally support and reinforce one another.*

2.4 Synthesis

Following our analysis, we synthesized the identified literature into a proposal for an integrative process model for BM transformation. Our aim was to integrate the literature available on BM transformation and identify the antecedents and consequences of troubled BM transformations. Theories of organizational transformation served as the basis for the analysis of the literature (Pettigrew, 1987; Lyytinen & Newman, 2008). We identified sensing, searching and implementing as the process stages for BM transformations. These stages not only are visible in the extant literature but also conform to the complementary views of organizational transformation as punctuations, evolution and the institutionalization of practices. The novel observation in our analysis was that the focus in the identified literature shifted from redesigning cognitive BMs toward revising economic BMs as the transformation advances. Similarly, we identified the following as contextual drivers: technical and economic

developments, the availability of resources and dynamic capabilities and management competencies in change management.

Furthermore, the unpredictability of the external context, indecisiveness, lack of resources and capabilities, cultural rigidities and a variety of cognitive, economic and organizational inertia were identified as inhibiting BM transformation. We suggest that these are also the primary explanations for troubled BM transformations in which the transformation process has stalled or is advancing too slowly to match managers' intentions. Finally, we identified the alignment of cognitive and economic BM elements, customer needs, technological capabilities and the firm's strategic objectives as the means to define the content of BM transformation and as the successful outcome of the transformation. Moreover, we proposed misalignment as an indicator of troubled BM transformations and also as a cause and internal contextual driver of further BM transformations.

Several literature reviews have identified contemporary themes in BM research and have suggested research agendas (Pateli & Giaglis, 2004; George & Bock, 2011; Zott et al., 2011; Lambert & Davidson, 2013; Veit et al., 2014; Wirtz et al., 2016). In addition, reviews have also focused on defining BMs (Al-Debei & Avison, 2010; Massa et al., 2017) and, more recently, on the compounding literature on BM innovation (Schneider & Spieth, 2013; Spieth et al., 2014; Foss & Saebi, 2017). The contributions in BM innovations have their merit in depicting the volume and variety of the extant literature and in introducing compelling avenues for research. However, they are intended to broaden the scope of research and, therefore, are not helpful in integrating the knowledge already available. By focusing on changes in established firms' BMs as holistic, systemic and time-limited transformations, we can provide actionable frames of reference to practitioners in designing and changing various aspects of their BMs. In addition, by applying the lens of organizational theory, our analysis arrives at an integrative theoretical model and propositions about the process, context and content of the BM transformation.

Pettigrew (1987) advises employing multiple lenses to conceptualize organizational change in order to observe both continuity and change. He also identified an approach for a multilevel, contextual and processual analysis of organizational transformation (Pettigrew, 1987). This means that a detailed analysis of a transformation needs to include consideration of 1) transformation process stages on an individual and system level, 2) the external and internal contexts affecting the process and 3) the past, present and future of the organizational aspects.

If we translate these into BM transformations and perceive a BM as the nucleus of an organization, we see actors performing tasks that are part of the process stages and that advance the BM transformation process. We also see customer demand, opportunities and the uncertainties of new technologies and other forces external to the company initiating, driving and affecting the transformation process and its outcomes. Moreover, we find internal factors, such as the availability of resources and capabilities, the use of technologies and

management models similarly bringing about, driving and influencing cognitive and economic BMs and their transformations. Finally, the past, present and future of cognitive and economic BMs are reflected in the alignment of the BMs with the external contexts and internal factors. In other words, the misalignment of a BM with customer demand, the resources available or the technology in use is the likely cause of BM transformations. The internal alignment of the BM with contextual factors is logically the desired outcome as it has the potential to improve financial performance.

Organizational transformations can be treated as holistic, systemic and time-limited transformations or, by contrast, as the patchy and continuous evolution of structures (Besson & Rowe, 2012). We recognize a similar contrast between the suggested view of BM transformation compared with the prevailing, interpretation of BM change as an evolutionary process through trial-and-error learning (Chesbrough, 2010; Sosna et al., 2010), or as “dynamic consistency,” where minor adaptation occurs spontaneously as a result of daily operations (Demil & Lecocq, 2010).

As a complement to the enduring perspective, in line with Gersick (1991), we propose a punctuated sequence of the process model for BM transformation. With the use of the model, we argue that management can make informed decisions regarding how to respond to context and BM misalignments and recognize a stable period when firms are exploiting the aligned BM and are reinforcing it. The model also recognizes situations in which managers terminate a BM to accommodate the rollout of a new BM or when managers make drastic changes to its elements, such as replacing technologies central to the value proposition, replacing partners or substituting revenue logics. This understanding is already usable now but the latter part of this study provides an even more practical insight into this topic.

Further, because the identified literature provides evidence of emergent changes, where, in line with Orlikowski (1996), the realization of cognitive and economic BMs are not known a priori, we combine an evolutionary frame with our model of BM transformation. We propose that evolutionary development takes place between the decision to react to the external conditions and the discovery of profitable cognitive and economic BMs that align with the external context. We also recognize that both the punctuated and evolutionary views of BM transformation fall short in explaining how cognitive and economic BMs align with the internal context, and how the potential of aligned BMs is unified across the organization. We, therefore, propose merging the lenses of institutional theory with the prior two theoretical perspectives. In practice, in line with Avgerou (2000), this requires acknowledging the process stage for standardizing the economic BM and aligning it with the firm’s internal context.

The details of the proposed process model for BM transformation are illustrated in Table 4. We aimed to explain complex BM transformation in a simple and generalizable way while simultaneously highlighting the main findings in our literature review. Furthermore, in our model, the demand for multilevel analysis (Pettigrew, 1987) is reflected in the cognitive and economic

BM. The cognitive BM represents the manager’s interpretation of the focal firm’s BM, formed via the cognitive processing of the contextual factors and, in the BM transformation process, employed to make decisions regarding the economic model. The economic BM refers to the manifestation of the firm’s resource, transactive and value structures. In the BM transformation process, managerial decisions and actions shape the new economic BM, and its alignments or misalignments affect the development of the cognitive BM.

TABLE 4 Process model for business model transformation.

Process stages	Stage 1: Sensing	Stage 2: Searching	Stage 3: Implementing
Process tasks	Monitor the environment for opportunities	Run experiments with the economic BM	Standardize the economic BM across the organization
	Review alternative cognitive BMs, and decide about BM renewal	Test and revise the cognitive BM	Employ change management procedures
Drivers	Technology-push and market-pull pressures	Dynamic ability to reconfigure the economic BM	Virtuous cycle resulting from BM alignment
	Management’s cognitive competencies	Organizational culture supporting experimentation	Economic profitability and BM performance
Inhibitors	Technical and economic uncertainties	Lack of resources and capabilities	Organizational inertia
	Inability to sense changes and to unlearn the prevailing cognitive BM	Rigid organizational culture	Technical and economic discontinuities
Alignment tasks	Achieve alignment between the external contextual factors and the cognitive BM	Achieve external alignment between the cognitive and economic BMs	Achieve fit between the internal contextual factors and the economic BM

Note. BM = business model.

First, the model needs to identify the horizontal process stages and tasks belonging to each of the stages (Pettigrew, 1987). We suggest three process stages – sensing, searching and implementing – as the main process stages in BM transformation, as argued earlier in Proposition A1 (cf. section “Process of Business Model Transformation”). The process stages and associated tasks, appearing in the literature, are described in a normative manner to assist firms in designing and managing BM transformation. Yet one important use of the process stages is analytical use as we used it in the second part of the study. The sensing stage involves systematically collecting information and reviewing the potential opportunities and uncertainties related to the BM. The BM

transformation advances once the cognitive BM is revamped, and the decision to engage in BM transformation has been made. The searching stage consists of running experiments with a new economic BM to increase the understanding of the viable and profitable cognitive BM. This conceptualization is in line with the reviewed literature, which suggests that companies test the new BM in parallel with the old BM before deciding to roll out the new economic BM. The implementation stage is where the rollout and standardization of the economic BM take place and where change management practices (Iveroth, 2010) are applied to secure the transition.

Second, the model needs to identify the mechanism that links contextual variables with the cognitive and economic BM and the horizontal process stages (Pettigrew, 1987). In line with Pettigrew (1987), the drivers and inhibitors included in our process model enable and constrain the BM changes; the BM transformation process also enacts changes in the internal and external contexts, as argued earlier in Propositions A2 and A3 (cf. Section 2.3.2). We adopted terminology from Hannan and Freeman (1984) and their organizational change studies for “inhibitors.” Hereafter, we use the term “inertia” as an impression for factors that prevent or slow down transformation.

Based on the literature review, we argue that in the sensing stage, technological and competitive forces have the potential to affect managerial cognition and to shape the cognitive BM. Through experimentation in the searching stage, a viable, profitable and aligned cognitive BM is found. When an aligned BM is found, it enjoys a virtuous cycle of reinforcing the dynamics between the BM elements and the external context. In plain terms, the BM appeals to customers. In the implementation stage, by executing and exploiting the economic BM, the focal firm has an impact on competition in the industry. Therefore, competitive pressures affect the firm’s BM transformation; but once the changes have been accomplished, BM alignment may increase competitive advantage.

Finally, the model needs to identify the content of BM transformation (Pettigrew, 1987), which we interpret as the origins of change, objectives for the transformation initiatives and the outcomes of BM transformation. Our process model suggests that the basic objective of BM transformation is to seek alignment, as alignment implies improved performance in the markets, as argued in Proposition A4 (cf. Section 2.3.2). Based on our literature review, we suggest that in the early stage, managers should seek to achieve alignment between external contextual factors and their cognitive BM. This means the managers should decide how a renewed BM responds to the opportunities and uncertainties of the operating environment. Furthermore, we suggest that in the searching stage, the key design principle should be to reach external alignment with the cognitive and economic BMs. In other words, the focus should be on making sure that the cognitive BM is appealing to customers and is fitting for partners. Finally, we propose that in the final stage, achieving a fit between the internal contextual factors and the economic BM is essential for further realizing improved BM

performance. In practice, this potentially requires reorganizing and standardizing technologies in use, the management model and daily routines.

2.5 Discussion of the literature review

In this chapter, we have analyzed the process, context and content of BM changes and have synthesized our findings into an integrative process model for BM transformation. We have also highlighted the value of our integrative analysis against the current literature review studies, as this is the first review to integrate separate research streams. We have additionally pointed out the value of integrating opposing processual views and matching them with the context and content of the BM transformation process. In the following section, we discuss the implications of this study for research and practice, along with its limitations.

2.5.1 Implications for research

The proposed process model of BM transformation is based on our literature review and argumentation, which means it is not yet empirically tested. It is in the researcher's own interest to continue research on these issues, but this cannot be done alone, and support is needed. Hence, we motivate other researchers to develop and test the proposed process model and its details under various boundary conditions to provide narratives and develop specific task descriptions and instructions for tackling inertia in the process stages and further investigating the role of IT in shaping the process and outcomes of BM transformation.

Prior literature reviews have already pointed out the need to extend the research scope to include and compare both entrepreneurial and incumbent firms in high-tech and traditional industries, as well as start-ups and established firms (Foss & Saebi, 2017). In light of this, we submit that the first research challenge is to validate the proposed process model as a general and practical frame of reference. Although the three process stages and the related tasks are similar for start-ups and incumbents alike, we expect variation in the internal and external contexts that would reveal differences in the execution of the stages and tasks, thus leading to various outcomes (Chesbrough, 2010; Andries et al., 2013; Kuk & Jansen, 2013; Berends et al., 2016; Mehrizi & Lashkarbolouki, 2016).

Furthermore, we note the role of technology in BM transformation when considering internal and external contexts. Technology can be an external condition triggering BM transformation, and an external condition can imply the possibility of acquiring the resource or of developing the technical capability of the organization (e.g., Kamoun, 2008; Ojala, 2016, Teece, 2017). Technology is also seen as a source of uncertainty when unavailability or changes in technology may cause misalignment (e.g., McGrath 2010; Bohnsack et al., 2014). It is viewed as a threat when technology negatively affects customer demand or competition (e.g., Frankenberger et al., 2013; Kuk and Jansen, 2013; Teece, 2017). Thus,

technological development requires the sensing of the external environment, as Kranz et al. (2016) have suggested.

In addition, our analysis identified situations in which technology was perceived as an internal condition, resource or capability. This affects the searching stage, as technological resources and capabilities enable firms to develop value propositions (e.g., Björkdahl, 2009; Rai & Tang, 2014). Firms may also develop and introduce new value propositions to the market based on technological innovation(s) to learn about the alignment while implementing and exploiting an old BM (Krantz et al., 2016). For this, Rai and Tang (2014) have presented a model in which strategic intent drives the search for a cognitive BM and drives the development of technical competencies. Their model thus suggests that technology can serve as an opportunity only if the firm possesses it. Consequently, changing technologies has the potential to cause misalignment; therefore, changing technology components results in an examination of the overall BM.

In addition to the comparisons of the external and internal contexts and the possible triggering conditions for BM transformation, we suggest adding and alternating vertical process layers to enrich the analysis of the dynamics in BM transformations. That is, besides capturing the interaction between cognitive and economic BMs, research should examine the dyadic interactions among technology and cognitive and economic BMs in a similar manner to how Lyytinen and Newman (2008) instructed. Furthermore, the interactions could be between a technology supplier and its value chain partners or, in the context of the contemporary IT industry, between the “keystone” or “orchestrator” and members of the business ecosystem (Iansiti & Levien, 2004; Manikas & Hansen, 2013).

Finally, our review and conceptual development inherently miss “the drama that characterizes change processes” (Lyytinen & Newman, 2008). We expect drama in all three stages of our model as managers try to comprehend the BM, as the new BM takes shape and especially as it is implemented in the organizational context. Our analysis of BM transformation literature revealed three research gaps in both the volume and depth of studies in this regard: First, the process of transferring knowledge from the previous process stage, standardizing a BM across an organization, and thus, the overall process of institutionalizing a BM is missing narratives and normative process models. Second, although the sources of organizational inertia are well covered in the extant literature (cf. Besson & Rowe, 2012), BM transformation offers an even more complex setting, with inertial factors arising from both internal and external contexts. Thus, we recommend revisiting the types and role of inertia in BM transformations. Finally, the development of practices for dealing with inertial factors offers an interesting and important research challenge. Although applying change management practices (Iveroth, 2010) to the implementation stage of the process is a logical countermeasure for the types of inertia, these practices have not yet been tested and validated in the context of BM changes.

2.5.2 Implications for practice

Our review is mostly limited to the research-based literature on BM changes, many of the identified research papers report and provide insights regarding successful and troubled BM transformations. We can, therefore, argue that the results and the integrated process model presented here suggests best practices for BM transformation. Specifically, we have presented three synthesized process stages, key tasks, main objectives and drivers and sources of problems and delays for which to look. In doing so, we have provided feasible advice for planning a program for technology-induced BM transformation in a similar manner as Kettinger et al. (1997), who advise planning tasks for a change in business processes.

The latter part of this study does not focus on the drivers for transformation, but using the results of this literature review, we focus on the barriers of change. However, it is clear that in practice, this comprehensive literature review provides a good overview of the understanding of the business model transformation and the different perspectives on changing business models. Moreover, the identified drivers and sources of cognitive, economic, and organizational inertia can be employed to steer transformation initiatives towards success or, even more so, identifying the reasons for troubled transformations.

2.5.3 Limitations

This literature review has certain restrictions that should be recognized in the interpretation and application of results. A possible limitation exists in the analysis and synthesis of a specific selection of scientific articles from IS field and not including articles from economic or business management sciences. This may rule out some interesting studies in the scientific literature, and it has certainly ruled out some of the popular practitioner-oriented literature available, including the evolutionary start-up process that Blank (2013) suggests, the BM design principles illustrated by Osterwalder and Pigneur (2010) and the evolutionary business development process suggested by Ries (2011). Although the insights and guidelines are not inconsistent with the suggested process model, these could provide additional insights into the tasks, drivers and issues related to the BM transformation process.

In addition, in our review, we have not included several articles examining BM innovations, which cover the impact of specific technologies or events on BM elements and configurations. This non-consideration may have resulted in the loss of some insights that could have complemented and extended our simple and generalizable process model.

Finally, following the objectives of scoping and integrative reviews (Pare et al., 2015), we approached the literature with the ambition of analyzing the literature available and of proposing an up-to-date, integrative process model for BM transformation. Although this approach focused the analysis and helped to develop a set of propositions and a simple, generalizable process model, it has

also produced a confined perspective on the vast amount of knowledge available about BMs.

2.6 Conclusion of the literature review

This research has analyzed the size and nature of the literature available about BM changes, classified and synthesized the existing literature relevant to understanding BM transformation and identified gaps for commissioning further research on the topic. We applied a systematic method for reviewing literature and identified 58 scholarly articles on the subject in journals and IS conferences. Our analysis and synthesis of the identified literature were based on organizational transformation theories, which guided us to consider the process, context and content of transformation.

The proposed model integrates previously separate streams in BM research. It can be used to plan BM transformations and to diagnose troubled transformation processes. The proposed model has implications for future research on BMs. It encourages further examination to link theory and practice to help practitioners to respond effectively to opportunities and uncertainties induced by novel technologies and fluctuating customer demand.

3 CASE STUDIES: ANALYSIS OF BUSINESS MODEL INERTIA

In the previous chapter, we provided a comprehensive understanding of current literature and formed a simplified three-stage BM transformation process along with inhibitors and drivers for each stage. In this chapter, we explore more focused, real-life case studies to identify relationships between BM elements and troubles in BM transformation and test our three-phase (sensing, searching and implementing) transformation model. The following section (Section 3.1) clarifies our definition of BM and outlines the case studies and research question. Sections 3.2 and 3.3 on BM transformation and inertia describe the main terms presented in the literature review and build propositions to be tested in the case studies. The remaining sections focus more specifically on empirical research and the research target.

3.1 Introduction

This section examines BM transformations in established companies and how transformations can be understood and managed. We focus on the problems that established companies might encounter in their BM transformations. Specifically, we synthesize some of the relevant literature and, based on the understanding produced in the literature review, present two individual case studies to investigate different types of BM inertia in the transformation process. Based on the insights from these studies, we propose a conceptual schema for identifying and analyzing sources and symptoms of sociocognitive, economic, psychological and sociotechnical inertia that hinder decisions regarding new BMs and the activities involved in developing cognitive and economic BMs.

The implementation of digital technologies or technological innovations alone, such as cloud computing, artificial intelligence (AI), machine learning (ML) or digital platforms, is rarely the source of competitive advantage for incumbent firms. Practically all firms seek innovative ways to exploit opportunities

presented by digital technologies for efficiencies and new business (Wrigley et al., 2016), and almost every digital product innovation is readily available and can be easily copied. However, the very same digital technology can be delivered to customers using two or more distinct BMs, which create and capture value differently (Chesbrough, 2010). Success, therefore, lies in innovating and transforming a firm's BM to reveal and exploit the value of digital technologies (Kamoun, 2008; Al-Debei & Avison, 2010; Veit et al., 2014).

Considering how many successful digital platforms there are in each business segment, and how even Amazon and IBM have struggled to match Microsoft in the cloud computing business, innovating and transforming BMs is clearly difficult for incumbent and start-up firms. Managers can easily decide that a BM must be changed and call for change, but they also have to manage misalignments with external contextual factors, contradictions between technology and BMs and organizational inertia resulting from the current BM design (Sosna et al., 2010, Van Alstyne et al., 2016). Consequently, decision-makers and IT managers need a common understanding of changing BMs and, especially, the practical conceptual schema and tools required to innovate and transform into a digital BM.

Some tools for BM development already exist. Extensive discussion about the BM concept (Osterwalder et al., 2005; Al-Debei & Avison, 2010) and the key elements of BMs (Hedman & Kalling, 2003; Osterwalder et al. 2005) have resulted in a number of conceptual schemas to facilitate the innovation and design of new BMs and communication between the stakeholders. These BM ontologies function as practical tools in designing the aspects that are relevant for conducting business.

Conceptual schema to manage the process of BM development also exist. In utilizing new digital technologies in a BM, a company must reconcile the new structure, processes, competencies, and resources of its organization with external factors, such as opportunities and market threats (Al Humaidan & Sabatier, 2017). When changing several components, it is often difficult to predict in advance what is ultimately the optimal alignment (Berends et al., 2016). Therefore, BM development can be accomplished by experimenting with new BMs (Cavalcante et al., 2011; Blank, 2013) or by changing an existing business with an evolutionary model (Bohnsack et al., 2014; Ojala, 2016).

As noted in the literature review, there may be a fallacy in the idea of change in BMs being an easy-going and smoothly progressing process. However, the current ontologies and process models of BM development cannot explain why BMs do not change. Current literature related to BM transformations assumes a smooth process. This potential fallacy is mostly due to the explanations of the circumstances before and after the change. Also, when white-boxing a successful case of BM transformation (e.g., Ojala, 2016; Teece, 2018), there is an illusion of a regular, successive progression of the change process steps. As highlighted in the literature review, a lack of understanding of troubled BM transformations indicates a need for more research into BM inertia. Consequently, the purpose of this chapter is to introduce the types of inertia encountered in BM

transformations and derive a conceptual model that can aid in analyzing the occurrence of inertia in BM transformations. Our pragmatically motivated research question is:

RQ *How can we recognize and solve the inertia associated with BM transformation?*

We develop a conceptual foundation, synthesize prior observations and conduct case studies of an IT company and technology company, which have been in the process of transforming their BMs toward service-based businesses since 2014 and 2017, respectively, to detect the circumstances in which inertia arise. By integrating the extant literature and empirical observations, the resulting conceptual model of BM inertia can serve as a tool to identify sources of inertia and their symptoms as well as to design and realize measures to mitigate these problems. This part presents a versatile account of the issues in developing BMs as well as a conceptual foundation and a novel conceptual frame for analyzing BM inertia.

3.2 Business model transformation review

A BM, as a general concept, refers to an interpretation of the aspects that are relevant for conducting business. It is a description of how a company organizes itself, operates, creates and captures value (Magretta, 2002; Osterwalder et al., 2005; Casadesus-Masanell & Ricart, 2010). In other terms, a BM is a description of the value creation and value capture logics of a firm (Al-Debei & Avison, 2010; Teece, 2010). Below, we develop the conceptual basis for BM transformations by discussing the complexity of the BM concept, clarifying the difference between cognitive and economic BMs, and conceptualizing BM transformations as a three-stage punctuated change process.

A BM is a multilevel, granular and holistic concept. First, professionals engaged in developing, innovating and changing BMs can choose the level of detail needed to describe their business on a case-by-case basis. For instance, one may discuss general concepts, such as value proposition or revenue logic, or may add details by discussing different pricing logic and temporal rights as parts of the revenue logic of the firm.

Second, a BM is not a single aspect of business but consists of several BM elements. According to the extant literature, the five main elements of BMs are value proposition, activities, structure, resources and revenue logic (Hedman & Kalling, 2003; Osterwalder et al., 2005; Al-Debei & Avison, 2010, Demil & Lecocq, 2010; Wirtz et al., 2016).

Third, a BM is not an isolated aspect of business, such as value proposition or revenue logic. Instead, it is a configuration of multiple elements; altering one element of the overall BM affects the others (Johnson et al., 2008; Demil & Lecocq, 2010). The analytical focus is, therefore, not only on the elements of the BM but also on their dynamics. Hence, the main focus of transforming a BM is finding alignment between the separate elements of the model. In addition to aligning

the elements of the sociotechnical system (Lyytinen & Newman, 2008), BM transformation is about aligning technologies, actors, structure, and activities with the value creation and value capture logics.

Proposition B1. *A BM connects a firm's sociotechnical system (technologies, actors, structure and activities) to its value creation and value capture logics (value proposition and revenue logic), so the BM is not a single perspective of business or isolated configuration of BM elements.*

To discuss the dynamic aspects of BMs, we further distinguish between two connotations of the concept. Namely, a cognitive BM (defined in the literature review chapter) is a manager's interpretation of the relevant resources, transactions and value structures of a firm in a coherent and viable configuration; an economic BM (also defined in the literature review chapter) represents an economic manifestation of the resources, transactions and value structures of the firm in a coherent and viable configuration (Al-Debei & Avison, 2010; Demil & Lecocq, 2010; George & Bock, 2011; Velu, 2017). In simple terms, the former corresponds to a manager's vision of the BM design (Aspara et al., 2011), and the latter corresponds to the execution of how a company operates, organizes itself and makes money (Magretta, 2002).

This distinction facilitates the definition of BM transformation as a holistic and time-limited process introduced to bring about major changes in cognitive and economic BMs. Such changes include replacing or extending resource, transactive and value structures to improve the alignment and performance of the overall BM under the contextual factors driving or restraining the change. We can understand a BM transformation by its stages of the transformation process, the factors driving or inhibiting the transformation and its desired and unwanted outcomes in the focal firm.

Considering the outcomes of the transformation first, we find that the transformation is holistic in nature (Sitoh et al., 2013; Veit et al., 2014). This means that achieving alignment between separate BM elements is the principal objective of BM transformation (Morris et al., 2005; Rai and Tang, 2014). A BM transformation consequently involves changes in multiple elements, and the desired outcome of a BM transformation is the reinforcement of dynamics between the BM elements (Demil & Lecocq, 2010; Casadesus-Masanell & Ricart, 2010; Berends et al., 2016). In troubled BM transformations, we find misfits between the BM elements, misalignment between the customer demand and value proposition, and misalignment between managers' views of cognitive BMs and realized economic BMs. The alignment of BM elements may result in an increase or decrease in the firm's economic performance (Johnson et al., 2008; Demil and Lecocq, 2010; Rai and Tang, 2014).

Proposition B2. *Business model transformation is an alignment process of changed BM elements. Business model transformation involves (i) aligned cognitive and economic BMs and (ii) a logical and aligned set of reinforcing BM elements.*

Turning now to the transformation process, it can be seen both as a lifecycle model involving steps (e.g., Tapscott et al., 2000; Pateli & Giaglis, 2005; De Reuver

et al., 2009) and as an evolutionary change process (e.g., Casadesus-Masanell & Ricart, 2010; Spiegel et al., 2016; Ojala, 2016). We see the BM transformation primarily as a punctuated transformation (Gersick, 1991) in which change is first initiated as the result of external conditions. Then the change is implemented, and finally, the BM is stabilized. Following the reasoning of Hannan and Freeman (1984), mostly due to the complexity of the transformation, we believe that the alignment between the cognitive and economic BMs requires learning and a series of adaptations and alterations. That is why we believe that the transformation includes a stage of searching for a successful BM.

Our way of describing BM change using a stage model follows Tsohou et al.'s (2019) stage model description regarding the idea that variables and different factors may change from one stage to another. As an example, our research design is intended to identify forms of inertia occurring at different stages of BM transformation. This thinking is also supported by the core of stage models, which suggest that the development of a phenomenon is divided into distinct stages (Tsohou et al., 2019). The utilization of a stage model kept our research focus on the factors of inertia and not on the transformation process itself, meaning that the stage model served the purpose of our study well and was easily utilized in our research context.

We define the sensing stage of BM transformation as an ongoing activity to monitor market signals and developments in digital technology, which results in generating alternative cognitive BMs (Voelpel et al., 2005; Aspara et al., 2011; Kranz et al., 2016) (see Figure 6). We also define the evolutionary searching stage of BM transformation as putting the cognitive BM into practice, that is, designing and executing experiments with an economic BM to test and revise the assumptions about the cognitive BM (Dunford et al., 2010; Yunus et al., 2010; Martins et al., 2015). Moreover, we define the implementation stage of BM transformation as transferring knowledge about the new cognitive and economic BMs to the whole organization and standardizing the execution of the BM across the organization (Cule & Robey, 2004; Sosna et al., 2010).

Proposition B3. *Business model transformation involves an evolutionary search for a successful BM, along with a series of adaptations and alterations. During the process stages of sensing the need for a new BM, searching for it and implementing it, the focus shifts from developing a cognitive BM to developing an economic BM as the process advances.*



FIGURE 6 Three-stage business model transformation process.

3.3 Business model inertia review

After discussing the stages and outcomes of BM transformation, this section addresses the factors driving and inhibiting change. Contextual drivers of BM transformation describe the triggers and the dynamics originating from the external and internal context of a firm. The literature widely highlights two external factors that drive BM transformations: advances in contemporary technology and competitive forces (Demil & Lecocq, 2010; Veit, 2014; Wirtz et al., 2016). Business model changes also originate from within companies. The choice of cognitive and economic BM is up to the company's managers, interpreting the changes in the environment and making decisions with regard to changing the BM (Demil & Lecocq, 2010; Aspara et al., 2011; Cavalcante et al., 2011). The availability of resources, dynamic capabilities of a firm and managers' change management skills are required to turn the developed cognitive model into a functional economic BM (Doz & Kosonen, 2010; Velu, 2017). Consequently, a firm's ability to transform a BM successfully can be seen as its efficiency of transformative activities and changes in the business environment (Aspara et al., 2011).

Existing BMs, however, contain mechanisms that prevent companies from actually changing them. In troubled BM transformations, the process does not advance at all, advances in an unintended manner or produces unintended results. One of the reasons for this is BM inertia, which we define as the tendency of the transformation process to advance slower than intended or to remain unchanged regardless of the decision to change the BM. This definition stresses the propensity of the transformation process. In the following paragraphs, we develop a conceptual schema for analyzing inertia in BM transformations based on the extant BM literature and notions of inertia in human, economic and sociotechnical systems. The schema highlights the properties of different types of BM inertia.

Sociocognitive BM inertia (cognitive inertia in the literature review) appears as norm enactment (Gersick, 1991) and typically occurs due to a cognitive bias towards existing business logic and the inability to commit to refining and extending the existing BM. The cause of inertia may also be a lack of knowledge (Bucherer et al., 2012) or the mere inability to imagine, understand and conceive of a superior BM (Chesbrough, 2010; Bucherer et al., 2012). In fact, many companies seemingly fail to understand their existing BMs and their natural interdependencies, strengths and limitations (Johnson et al., 2008). Sociocognitive BM inertia results in misunderstandings and the biased perceptions of opportunities and risks, leading to the filtering out and restraining of new ideas (Sosna et al., 2010; Berends et al., 2016; Mehrizi & Lashkarbolouki, 2016). This means that even if there is a perceptible trigger for change, a firm's BM will not transform.

Economic BM inertia takes shape in economic path dependencies and an inability to mobilize resources for new purposes (Hannan and Freeman, 1984;

Besson and Rowe, 2012). It stems from investments in existing capabilities and resources or shortages thereof, existing contractual obligations and the difficulties of cannibalizing the existing business (Voelpel et al., 2005; Mehrizi & Lashkarbolouki, 2016). Economic BM inertia manifests in managers' reluctance to unlearn the current BM and in protecting and improving old cognitive and economic BMs (Johnson et al., 2008; Mehrizi & Lashkarbolouki, 2016).

In addition, sociotechnical BM inertia (technological inertia in the literature review) appears as path dependencies in the sociotechnical system (Lyytinen and Newman, 2008; Besson and Rowe, 2012) and results in the inability to exploit technologies to develop a new BM. Technological resources and capabilities enable firms to develop value propositions (e.g., Björkdahl, 2009; Rai & Tang, 2013; Ojala, 2016). Digital technology can, therefore, serve as an opportunity only if the firm understands its potential, possesses it and has the capability to exploit it. Consequently, firms that lack resources and have inabilities may not develop or introduce new value propositions to the market (Kranz et al., 2016) nor learn about the alignment of technology with BM elements.

Finally, psychological BM inertia covers general change resistance and threat perception (Klaus and Blanton, 2010; Besson and Rowe, 2012), blocking the development of the new BM. In the literature review, this form of inertia was classified as organizational inertia. But as organizations are compounded by humans, change resistance and threat perception are actually human-level factors, meaning it is a psychological type of inertia. The main causes include endorsement of prevailing practices and assumptions (Vlaar et al., 2005; Sosna et al., 2010), the rigidity of employees owing to inflexibility embedded in the organizational culture (Lucas & Goh, 2009; Bucherer et al., 2012) and unfamiliarity with the benefits of the new BM (Bucherer et al., 2012). The ramifications of these inertial factors include a general lack of willingness and social groups' opposition to BM transformation initiatives (Cule & Robey, 2004).

Proposition B4. *Business model transformation advances slower than intended or remains unchanged because of the existence of sociocognitive, economic, sociotechnical and psychological BM inertia.*

3.4 Research method

Our review of the relevant literature resulted in the definition of a set of concepts to discuss the inertia present in BM transformations and integrated the prior literature into four propositions (listed in Table 5). The propositions capture the essence of the BM concept (Proposition B1), the main objective for the BM transformation (Proposition B2), the three stages for the BM transformation (Proposition B3) and the conceptual schema for analyzing BM inertia (Proposition B4). Understanding inertia can help managers, entrepreneurs and scholars to diagnose troubled BM transformations and apply appropriate interventions.

TABLE 5 Literature-based propositions for analyzing BM transformation.

#	Proposition
B1	A BM connects the firm's sociotechnical system (technologies, actors, structure and activities) to the firm's value creation and value capture logics (value proposition and revenue logic), so the BM is not a single perspective of business or isolated configuration of BM elements.
B2	Business model transformation is an alignment process of changed BM elements. Business model transformation involves (i) aligned cognitive and economic business models and (ii) a logical and aligned set of reinforcing business model elements.
B3	Business model transformation involves an evolutionary search for a successful BM, along with a series of adaptations and alterations. During the process stages of sensing the need for a new BM, searching for and implementing it, the focus shifts from developing a cognitive BM to developing an economic BM as the process advances.
B4	Business model transformation advances slower than intended or remains unchanged because of the existence of sociocognitive, economic, sociotechnical and psychological BM inertia.

Note. BM = business model.

This study empirically examines the inertia confronted in the BM transformation of a European IT firm (especially its Finnish branch) and a Finnish-based technology company. These two case studies, which focus on the transformations and their associated difficulties, enable us to address the lack of an integrated conceptual schema and empirical insights of the circumstances in which the inertia occurs. An empirical investigation was designed to assess the four identified types of BM inertia in each firm: sociocognitive, economic, sociotechnical and psychological.

In particular, our study applies an interpretive case study approach (Walsham, 1995; Klein and Myers, 1999) to produce new insights to understand and portray the inertia in BM transformation. Overall, these case studies are a suitable way to examine changes within a firm and its environment (Eisenhardt, 1989), to comprehend the experiences of practitioners and to capture the complexity of the phenomenon (Benbasat et al., 1987). Moreover, the approach allows for generalization from the case to theory (Walsham, 1995). The present study is a holistic study with two individual case designs, which is generally suitable for exploration at the outset of theory generation (Benbasat et al., 1987).

These cases were selected for theoretical reasons, as advised by Eisenhardt (1989). They were selected based on the following criteria: (i) the BM transformation had been initiated by a decision to engage in major changes in the firm's BM; (ii) the BM transformation had advanced to the implementation stage, thus making it possible to observe all stages of the transformation; (iii) the BM transformation had a long time span, thus indicating the existence of inertia in the process. Following the notion of purposive sampling (Miles and Huberman, 1994), the cases were selected so that it was possible for researchers to observe the firm in question over a longer period of time.

To gather insights from these cases, which spanned several years, from 2014 to the present, a variety of data collection techniques were employed. Data about

the process of the BM transformations were obtained through open-ended interviews, documentary sources and many informal discussions with the former CEO of Alpha and current CEOs in charge of the transformations in these companies. The written documents included 22 memoranda and minutes of meetings, five press releases, and the companies' websites. The data about the BM transformations process was collected by one of the authors between July 2014 and April 2020.

Primary data providing insights into inertia in BM transformations were obtained through interviews in July 2018 and April 2020. Specifically, six informants were named from both companies to participate in semi-structured interviews based on their role in the transformation process. All selected persons were acting in key roles for the BM transformation. We spoke with both CEOs and concluded that six employees per company was a relevant number of interviews compared to the company size and the number of persons who were involved in the change process from the beginning in key positions.

Based on the three criteria listed above, we selected two companies (Alpha and Beta, both pseudonymized) that operated in different industries, had an existing profitable business and were at least medium-sized companies in their own industry in Finland. The key BM change for both of these firms was based on technical innovation or new technological capability that led these companies to change their existing BM towards service business and continuous value creation. It was assumed that existing business, structures, culture, know-how, and many other factors contributed to the process of BM change, slowing it down, if not stopping it altogether.

The informants included former CEOs, a current CEO, and four other managers or persons responsible for developing and implementing the new BM. The interviews lasted from 30 minutes to 41 minutes. An interview guide was developed prior to the interviews. Data collection focused on the BM transformation process and the types of inertia. In particular, questions were asked about the stages of the transformation process and on the issues, inactivity and related causes in the BM transformation. Interviews were recorded and transcribed for analysis. Basic details of interviews are listed in Appendix C.

Data analysis followed the principles of qualitative research on data reduction, data display and drawing conclusions (Miles & Huberman, 1994). In the data reduction step, a historical narrative of a BM transformation was constructed, following guidelines suggested by Davidson (1997). We mapped our data to the structural components of narrative accounts: (i) relevant contextual information about interviewee's view of the transformation process, (ii) interviewee's description of the kind of inertia encountered, (iii) interviewee's perceptions of the past events leading to inertia in the process and (iv) interviewee's perception of the outcome of the events.

In the data display step, the insights into the narratives were coded according to the four identified categories of BM inertia. The coding procedure involved one author providing the initial codes after conducting the interviews in the first case study, which were then reviewed by the authors together. After

reviewing the initial coding, the authors agreed on the coding of the inertia identified. This approach was selected to avoid inter-coder reliability issues. Comparing the initial and agreed upon coding, we calculated the overall percentage of agreement to be 86.4% between rounds in the first case study. The second case study followed the same coding mechanism and criterion for classifying inertia factors. In the conclusion step, aspects relevant to the present study were identified, and a tool for identifying the sources of inertia was developed.

It is noteworthy that in this part of our study, we focused only on barriers on transformation of business models, and in the interviews we did not consider factors that enable or support a change of business model in order to maintain the focus of our research.

3.5 Business model transformation case study: Alpha Ltd.

Alpha Ltd. is a midsize company in Finland, established in 1995. It is an IT distributor and service provider (IT distributors are wholesalers of software and hardware that act as intermediaries between vendors and value-added resellers). Alpha offers a wide range of computer equipment (laptops, servers and mobile devices) and software (operating systems, office tools and productivity applications). The BM transformation in question was to respond to the market trends and the demand for cloud-based solutions, dynamic licensing and usage-based pricing. Interviews and documentation also revealed decreasing product margins and tightening competition as causes of the transformation. These market conditions led Alpha to launch a broad strategic move to turn its product-based business into a service-based business. It was believed that integrated services would bring added value, but also reinforce customer relationships.

3.5.1 Alpha's transformation process

A portrayal of the BM transformation process at Alpha provides the necessary contextual information to understand the circumstances in which the inertia may arise. Based on the documents and informants' narratives, it is possible to reconstruct the timeline of change and review the reasons for the transformation. The developments are summarized in Figure 7.

The strategic decision to turn into a service provider launched a sequence of events in 2014. Alpha first acquired a new technology, which enabled value-added resellers to provision software-based solutions themselves. It was soon understood that the introduction of new technology would cause several other changes in the company's business. In other words, this acquired technology triggered a wider BM transformation. At the same time, it allowed a new value proposition for Alpha's customers but also brought about a major change in the mode of sales and in customer deliveries. To manage the transformation process, Alpha hired employees who brought an understanding of service-orientation to

the company. The business development manager (BDM), who took the position in 2014, explained the basis for developing the BM:

“The assumption was that our customers also wanted to follow the megatrend, get everything as a service. The platform also became a key resource for improving our efficiency and customer experience. But, initially, there were no plans on just how the technology should be used.” (BDM, Alpha)

The current CEO (who was also the former CFO) firmly believed that completely new models could not be planned upfront, but a bold decision needed to be made to develop a vision for the future BM:

“The purchase of cloud technology was a relatively small action compared to the implementation of our strategy. But we decided to try a new path and soon learned what [was] the best direction.” (CEO, Alpha)

The former CEO supported the same approach:

“Even though we hired new professionals to take care of [the] new business type, we really didn’t know what that would demand from the rest of the organization or any other employee.” (ex-CEO, Alpha)

In the months after the recruitments, the early idea of the new cognitive BM was developed further into something that could be tested with selected customers. Running technology trials and testing the cognitive BM required the building of new internal processes, integrating the new technology into the existing systems and developing proofs-of-concept with technology vendors. The new value proposition was based on the ease of buying and provisioning IT services. In practice, Alpha would provide all IT services and adjacent services (e.g., financial services, logistic services) through a single point of contact online. The revenue logic was converted from selling single product items to monthly subscriptions for all services with a single invoice. An account manager (AM) noticed a holistic change in the firm:

“Starting from changing the corporate culture, automating tasks, improving customer experience, and this brutal openness to increasing understanding about the change.” (AM, Alpha)

The cognitive change occurred during the transformation, not upfront, as a business unit manager (BUM) described:

“We have started to learn after we started execution. After years of doing, we are finally starting to understand how comprehensively our business is moving towards services.” (BUM, Alpha)

Alpha tested and revised the BM iteratively, one proof-of-concept at a time, and chose a large number of customers for the trials. This allowed for gradual learning about the renewed customer experience, finding suitable means for marketing communications and increasing the degree of automation in service delivery. A business development manager described the approach forthrightly:

“It was experimental. No one knew what we would face next. We had to improvise as we went on.” (BDM, Alpha)

The current CEO stated their iterative approach similarly:

“It’s rare that something [so] big can be planned beforehand. At the end, the operational model looks so different than the model we thought it supposed to be. [Our] own opinion is that we need to experiment and iterate substantially on the way.” (CEO, Alpha)

The former business development manager expressed a complementary opinion when he described how different parts of the organization were still developing their own operations in a new direction:

“It can be said that this kind of transformation is never done in a company [that] has so long and deep background from a business that is so fundamentally different than the new direction. We tackle these legacy matters and learn ways to do as we go.”

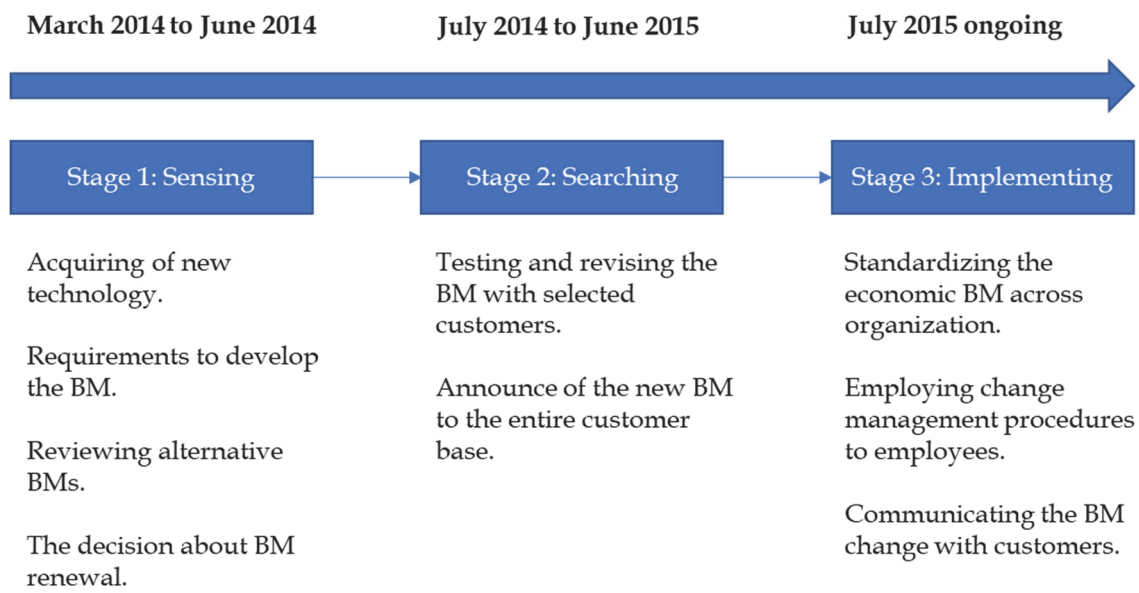
Alpha announced the new BM to its entire customer base in mid-2015. Still, many of the managers felt that the firm was far from ready to become a service-based business. They reported using the next few years to learn how to run the economic BM. The former CEO and the business development manager described the implementation as a prolonged period of time:

“We spent the next few years learning the new model. We continued the integration of services to the platform and simultaneously trained our employees and learned the best practices.” (CEO, Alpha)

“First two years, while we were trying to fix our internal issues, we also focused a lot on training our customers, repeated our key message and built trust for our new business model.” (BDM, Alpha)

After rolling out the new BM to its customers, Alpha kept adding services to its platform and used the platform as the means to standardize and cement its economic BM. The change management procedures included training salespeople and developing a reward system to encourage employees to follow the new economic BM. Finally, the interviewees stated that the implementation of the economic BM, and thus putting the service-based strategy into practice, is still an ongoing activity.

The timeline of the events and activities of Alpha’s BM transformation is shown in Figure 7. As can be seen, the transformation began in 2014 with the sensing stage, which resulted in the decision to renew the BM. The decision prompted a search for a new cognitive and economic BM which was tested with selected customers. We counted the start of customer testing as a trigger to move to the second stage. After a fitting model was found, Alpha implemented the economic BM and started to communicate new BM to their entire customer base. We counted this communication as a move to a final stage.



Note. BM = business model.

FIGURE 7 Timeline of the business model transformation in Alpha.

3.5.2 Inertia in Alpha's business model transformation

The narratives shared by Alpha representatives about the BM transformation indicate the presence of factors slowing down the process. In the sensing stage, it was mostly about sociocognitive inertia that slowed down the decision-making process regarding the new BM. In the searching stage, the development of the new economic BM was hindered by economic, sociotechnical and psychological inertia. Finally, in the ongoing implementation stage, Alpha experienced inertia arising from employees' unwillingness to change and the inflexibility of the organization, as well as from customers' inability to take on the new economic BM. In the following paragraphs, we present results related to the inertia experienced during Alpha's BM transformation. The types of inertia observed, and their effects are summarized in Table 6 (presented later in this Section).

At an early stage of the change, when a plan was needed to implement the strategy and exploit technology, the company's executives perceived uncertainty as to the decisions related to the new BM. Uncertainty slowed down the building of the overall picture of change and the communication of plans and change targets to middle management and employees. The lack of vision regarding the new cognitive BM also prevented the old BM from being abandoned. The current CEO (former CFO) described the complexity of the BM and the obstacles to decision-making:

"Do we even understand the basics? Why do our customers actually buy from us? Then we see the need to introduce monthly service fees and combine these two different worlds together. And when adding other compulsory elements, the complexity of the whole will multiply . . . We can make calculations, analyze markets, and more, and these are all external influences, but when we need to evaluate internal

activities, and what we have to change, then we realize we don't know how to do it right." (CEO, Alpha)

Focusing on the new technology instead of customer needs also caused difficulties in conceiving the new cognitive BM. A business development manager commented,

"First, we made it all technological. Cloud platform was sold on the basis of its technological value, but there really was nothing that anyone could buy." (BDM, Alpha)

"It is also notable that whenever we started to talk about platform or cloud business, the discussion always ended in a discussion about standards and technologies instead of value [that] we could offer. Always [the] CTO or CIO were invited to discussions because business decision-makers had a huge challenge to understand new ways to do business on top of technical solution. But this can also be IT industry-related issue." (BDM, Alpha)

The same perception was noticed by another business unit manager:

"It is actually weird that we were talking about platform business when we were doing service business. All marketing materials and communication were related to cloud business, not the business value." (BUM, Alpha)

"It's a problem in [the] IT industry that every decision is based on technologies, and new opportunities are evaluated from a technological point of view." (BUM, Alpha)

In the searching stage, Alpha ran trials with the new platform and tested the new economic BM. At this stage, and later in the implementation stage, managers at Alpha encountered several different types of economic BM inertia associated with executing the old product-based model together with new service-based BM. First, the salespeople at Alpha were inadequately skilled at selling services, and they were not pushed to learn the needed routines. At the same time, the managers promoting the new economic BM faced a lack of priority over the old model combined with a lack of resources allocated to experimenting with the new BM. As a consequence, it was difficult to get managers and salespeople involved, as there were no incentives. In fact, moving to sell services was even discouraged as the initial sales commission of product items was much higher. This is because, in service sales, the commission accumulates over time. A business line manager (BLM) and the former CEO commented,

"When a person has worked in a certain way for a long time and then suddenly you need to start selling services and commercializing them, it does not happen as easily as you could imagine." (BLM, Alpha)

"For example, measuring the success and incentives. If the managers, including me, had been in a closer dialogue with the folks making the change in practice, these things would certainly have been solved earlier." (ex-CEO, Alpha)

Moreover, other respondents noted that Alpha continued providing its customers with one channel for purchasing products and another for ordering services via two separate technology platforms. As a result, most customers did not start subscribing to services and did not notice the new value proposition of

the renewed economic BM. Surprisingly, sociotechnical inertia was not a major issue in the change stemming from the introduction of the new platform technology. The respondents speculated that the integration of technologies could cause impediments to the process, but these could be easily fixed by assigning resources to the task.

Interviewees recognized a number of causes and types of psychological inertia that slowed down the developments, both in connection with experiments with the customer and later in the process of implementing the changes to the economic BM. The reasons for Alpha's transformation were predominantly related to the rigidity of the organization and its employees: the inertia was related to the outdated roles, which did not align with the new BM. It was about the failure to understand the benefit of transitioning the BM and generic change resistance. The inertia also stemmed from a lack of courage to try new things and hire new talents. A business unit manager observed,

"Roles, responsibilities, a clear understanding of what you are selling and in what ways. It's missing . . . If the salesperson's objective is around half a million a month, then it is clear that she will not sell the cheaper service packages with monthly payments because she does not get anything from it." (BUM, Alpha)

Psychological inertia may also be seen as a lack of prioritization or ability to find time during daily business to take part in and learn about new business initiatives. One business development manager stated,

"One reason is certainly that people are really bad at prioritizing things. If an organization makes a strategic decision about something, then it applies to everyone. So, everyone should allocate time for it. For example, find time to attend trainings. If I personally organized over 30 trainings in half a year and none of them suited some of the people, it must say something about prioritizing." (BDM, Alpha)

A business line manager also noted that Alpha's employees who worked on the trials failed to collect and appreciate the experiences of each case. They also failed to apply that practical knowledge in the following case.

Finally, the respondents made several mentions of the inability of customers to convert to the new model. These were resellers who understood the strategic change and the new mode but did not have the capability to purchase and deliver the service further. Besides their lack of capability, the customers also had difficulty perceiving the benefits of the new approach and BM. It was believed that this issue was linked to the paucity of incentives among salespeople. The business development manager and the former CEO commented,

"Customers were not aware of whether their IT staff should configure some cloud service settings several hours for their customers when our platform can do it for free . . . The customers were saying that this cannot be free, what is the problem, how do you get the money from this?" (BDM, Alpha)

"In the initial stages, we often faced the challenge that our customers understood the strategic change and the new model, but they did not have the capability. Because our resellers are companies that produce their own services on top of our solutions or sell them forward, radical change also required the customers to have the capability and to be able to act according to the new model." (ex-CEO, Alpha)

The classified types of inertia observed in Alpha’s BM transformation, as well as their symptoms and sources, are summarized in Table 6. The results obtained from the case suggest that sociocognitive BM inertia appeared in the sensing stage of the BM transformation, economic BM inertia appeared mainly in the searching stage, and psychological BM inertia affected the change in the implementation stage. Overall, the results indicated that sociocognitive BM inertia hindered decision-making about the new cognitive BM, whereas economic and psychological BM inertia impeded the activities of developing and implementing the new economic BM. Interestingly, in this case, the sociotechnical BM inertia appeared in the implementation stage as the resellers’ inability to exploit the new model produced by Alpha.

TABLE 6 Classified inertia factors in Alpha’s business model transformation.

Process stages	Stage 1: Sensing	Stage 2: Searching	Stage 3: Implementing
The main types of BM inertia	Sociocognitive BM inertia	Economic BM inertia	Psychological BM inertia and sociotechnical BM inertia
Observed BM inertia: Sources and symptoms	The complexity of BM design and uncertainty hindered the decision about the new cognitive BM	Running the old economic BM reduced the priority of the transformation effort	Ignoring the need for change impeded the transition into the new economic BM
	Technological emphasis limited that formation of the new cognitive BM	Lack of resources and incentives hindered the uptake of the new BM among managers and employees	Customers were unprepared to transition owing to their lack of capability

Note. BM = business model.

3.5.3 Discussion of Alpha’s case study

Alpha’s BM transformation case was characterized by repeated conflicts and problems that slowed down the envisioned developments. In Alpha’s case, the value proposition and revenue logic were changed using platform technology, but the new model was incompatible with the mode of sales and customer capabilities, that is, misalignment between activities and the rest of the BM. We associated this observation with Proposition B1 (the connection between the BM elements) and Proposition B2 (alignment as the goal of the transformation process). Specifically, we interpret this as a result of the holistic nature of the BM. Changing one element of a BM causes a change in another; that is, a change in a BM element might cause misalignment with other elements.

Alpha’s BM transformation shows that change cannot be completely planned in advance, but it must be carried out iteratively by experimenting with

different cognitive and economic BMs. This means that, in addition to the tools used to design the BM at the beginning of the change, another set of tools is needed in the search and implementation of the BM. In our opinion, the current tools for developing BMs (such as the lean start-up process) have been designed for new businesses. Furthermore, established companies need help transforming their businesses, which involves a different process than launching a start-up company. The incumbents have contractual obligations to serve the needs of their clientele and cannot “pivot” when the first problems arise. They need to solve problems and inertia. For the established companies, the question is:

RQ *How can we recognize and solve the inertia associated with BM transformation?*

In examining the forms of inertia observed in this case, we found that the BM inertia at different stages of the Alpha’s BM transformation followed the conceptual schema we built by integrating the extant literature. We connected this observation with Proposition B3 (the process stages in BM transformation) and Proposition B4 (the different types of BM inertia). On the basis of literature and empirical observations, we propose a tool for analyzing inertia in BM transformations, which uses the concepts and the relationships between concepts to identify and describe BM inertia at different stages of the transformation process. The details of the proposed schema are illustrated in Table 7.

First, the schema identifies three stages of BM transformation: (i) The sensing stage is for monitoring market signals, developing cognitive BMs and making decisions about BM renewal. (ii) The searching stage is for testing the assumptions of the cognitive BM, executing experiments with the economic BM and deciding on the details of the economic BM. (iii) The implementation stage is for standardizing the execution of the economic BM across the organization.

Second, the schema identifies four main types of BM inertia and how these are associated with the cognitive and economic BM and the process stages. Based on the literature review and Alpha’s case, we argue that, in the sensing stage, managers are inclined to follow the current business logic and unable to imagine new BMs causing sociocognitive BM inertia. This type of inertia is inherently associated with the cognitive BM, which is a BM design in the manager’s mind. This may also delay or prevent a decision about BM renewal.

Through experimentation in the searching stage, a viable and profitable BM is found. Our schema suggests that this development may be hindered by economic BM inertia because of existing resources, capabilities and incentives and the lack of resources and reward scheme assigned to support the new BM. As witnessed in Alpha’s BM transformation, this has the potential to be a vicious cycle in which employees are not motivated to contribute to the execution of the new BM and, without success in attracting new revenues, managers are unlikely to allocate resources for the execution. In such an instance, the searching stage is also decelerated by psychological BM inertia. In the case of developing new BM incorporating digital technologies, the lack of know-how or lengthy deployment of the novel technology may impede the search for a viable BM. In this stage, the companies are mostly working to develop their economic BM. However, the

stage also includes an assessment of the cognitive BM. Thus, the economic BM inertia affects the development of both the cognitive and economic BM.

TABLE 7 A conceptual schema for analyzing Alpha’s business model inertia.

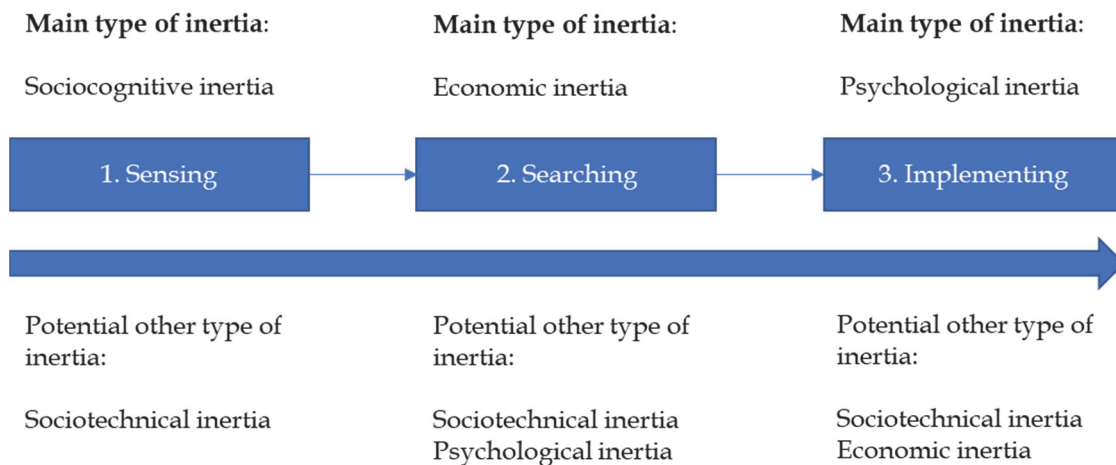
Process stages	Stage 1: Sensing	Stage 2: Searching	Stage 3: Implementing
Target for development	Cognitive BM	Economic BM	Economic BM
Main type of BM inertia	Sociocognitive BM inertia	Economic BM inertia	Psychological BM inertia
Other potential types of inertia	Sociotechnical BM inertia.	Sociotechnical BM inertia. Psychological BM inertia.	Sociotechnical BM inertia. Economic BM inertia.
Sources and symptoms relevant to analyzing BM inertia (incl. but not limited to)	<p>Managers decline new ideas due to the complexity of BM, lack of knowledge or conflicts of interest.</p> <p>Managers are unable to decide on the new BM because of technical and economic uncertainties.</p> <p>Inability to conceive alternative BM designs due to bias towards existing business logic and technology.</p>	<p>Managers are protecting the old BM owing to investments in existing capabilities and resources.</p> <p>Managers are unable and reluctant to unlearn the prevailing BM because of profitable agreements and cash flow.</p> <p>Inability to exploit technology due to lack of resources, know-how or delayed deployment.</p>	<p>Employees’ opposition to change or new technology owing to the inability to perceive the benefits.</p> <p>Employees’ lack of readiness to change because of the need to unlearn current practices and assumptions.</p> <p>Inflexibility due to rigid organizational structure or culture.</p>

We consider that, in the implementation stage, the process of standardizing the economic BM is likely to be affected by psychological BM inertia. Employees are likely to ignore or oppose the change as long as the benefits of turning to the new BM are unclear or the burden of learning the necessary competencies required to carry out the activities of the new BM outweigh the benefits. In the implementation stage, the firm may also encounter economic BM inertia in the form of inadequate resources required to perform the transition as fast as the managers would hope. Economic and psychological BM inertia inhibits the alignment of the BM elements.

Third, the schema recognizes the possibility of secondary types of inertia in the process stages. In particular, sociotechnical inertia appears as the inability to understand the potential of technology as part of the BM; as a lack of

technological resources, capabilities, and know-how to employ the technology; and as organizational inflexibility, preventing the exploration and exploitation of novel technologies as part of the BM.

Finally, the conceptual schema includes conceptual elements relevant to analyzing and managing BM inertia in the transformation process (see Figure 8). The concepts examined in the present study include sources and symptoms of BM inertia, which facilitate the identification and analysis of the three types of BM inertia. Managers encountering BM inertia in their transformation effort should (i) identify the symptoms of BM inertia blocking the development and (ii) eliminate the sources of BM inertia to advance decisions and activities.



Note. BM = business model.

FIGURE 8 Analyzing Alpha’s business model inertia in the transformation process.

As can be verified by Alpha’s case of BM transformation, the types of BM inertia can be identified based on their symptoms. In this case, sociocognitive BM inertia was observable in delayed conclusions about the new BM. In turn, the slow adoption of the new BM among managers and employees was a symptom of economic and organizational BM inertia in the searching stage. In the final stage of Alpha’s transformation, our respondents noticed that employees and customers’ lack of readiness to change held back the preferred outcome of the process. Alpha’s case also exemplifies how inertia can be eliminated to advance the transformation. For example, to deal with the sociocognitive BM inertia that arose from a lack of competencies, Alpha’s CEO hired a business development manager and other experts in the service-based business to help design a feasible cognitive BM.

3.6 Business model transformation case study: Beta Ltd.

Beta Ltd. is a medium-sized company in Finland. It operates on a global business segment, offering technological solutions in smart industry or smart factory domains. The company was founded in the 1970s and consists of several different business units and models. None of the existing BMs had previously been service-type operations but instead project- and supply-contract solutions. So, it was more or less obvious that at some point in time, a service-based offering will be needed to respond to developing customer and market needs. The company's first idea for a service business began in 2017 with the need for the development of an existing solution with trending technological possibilities. At the beginning of 2017, Beta started to investigate how machine learning (ML) and artificial intelligence (AI) solutions could help it to improve its current solution toward data-based pricing, continuous service production and service-based BM. That combination launched Beta's BM transformation process.

3.6.1 Beta's transformation process

As with Alpha, Beta's need to change its BM and technology-driven change can be verified using several documents and interviews conducted with employees of the company. The three-stage transformation of the BM began in 2017. The entire transformation flow is illustrated in Figure 9.

The first idea of developing the existing solution by using ML and AI to the direction of completely new solution began at the beginning of 2017. The idea was accepted instantly by the decision-makers. The initial idea was to improve the existing solution, not to change the BM directly in the direction of a service-based business. However, immediately after the first meetings, it became clear that the BM also needed to be changed. In practice, this meant that the technical implementation as part of the new solution to be developed led directly to a change in the BM and initiated a chain reaction of changing several different parts.

A relatively limited number of people were involved during the change process, prior to the company-wide implementation, which enabled rapid technological development but also unified the interviewees' thoughts on the scope of the change. The 2017 project manager (PM) commented,

"By following the development of technology and retrieving information from the Internet, we quickly realized that our existing customer solution can be significantly developed with artificial intelligence. At that point, we had no idea what other business model changes this will bring when it comes." (PM, Beta)

The current business director (BD) highlighted that, even today, all impacts of a BM transformation cannot be predicted:

"At that moment, it was just easy to start planning how the new technology would be used and how it could be utilized. At that point, we did not realize how huge change it could lead us to. We still do not really know today how big [a] change moving towards service business will be for us across the corporate level. This is a

change in only one of our businesses, and if successful, all other business operations will follow.” (BD, Beta)

In other words, experimenting with how new technology could be utilized was a much more realistic approach than trying to plan too far ahead in the future. As the CEO noted,

“I thought that the implementation of a completely new kind of technology would be easy for us, but I could not even guess its effects on our business, even though I have experience [with] large change processes. However, we could not [keep thinking] about all that the future will bring but [had] to accept the change step by step, even without a grand plan.” (CEO, Beta)

With the people involved in the company’s previous customer solution project, the core team boldly proposed the introduction of the new technology to the company’s management as soon as the end of 2017. In the sensing stage, discussing practical ideas regarding how to benefitting from AI, it was determined that the pricing model for customers should at least be changed toward a service-based pricing model and away from the project and consulting models. A project engineer (PE) found the service-based pricing model flagrant in today’s consumption centric world:

“Well, it’s actually responding to the changing market circumstances, customer needs and the pressure from the external environment. All businesses, regardless of the industry, are serviced, although it is not yet the prevailing theme in our industry.” (PE, Beta)

It took a while for the promising idea to move to the implementation stage. Convincing management and building financing options in the middle step took almost a year and required more funding applications before moving on to the first implementations and proof-of-concept. A service director (SD) suggested that they could have been faster to move to the experimentation phase if they had had enough commitment from the top-level management and, as a result, better financial support to the initiative:

“Actually, we waited months until the funding for the project was secured [and] it was time to really began working. Until then, doing was on the level of speeches and ideation. When management secured the project funding, we saw that now we are really developing and there is no going back.” (SD, Beta)

It was clear to Beta from the very beginning that its own expertise in the new technology was not at the level where new technology could be implemented or used to build a suitable solution for customers. It was strategically decided that, in order to enable a quick and easy start, the technology should be subcontracted for outsourcing. A business director found the use of subcontractors much more effective in the first experiments than spending a lot of money and resources to train their own employees:

“In many cases training our internal resources to do something completely new is a long way to gain real competence about new technologies or innovations. For most

people, it is also almost impossible to spend that much time on trainings concurrently to their existing responsibilities.” (BD, Beta)

Thus, after months of waiting for funding and an understanding of the inadequacy of internal resource skills, it was a step to onboard the subcontractor to carry out the technical implementation under the guidance of Beta’s own project team. This phase led to a change in the proof-of-concept phase of the process, where a new service development project was carried out for an existing customer, and a whole new value promise and the idea of a new service-type business surfaced from a collaboration with the customer. In practice, therefore, after Beta’s technological success, it was clear how technology would change the BM, and the extent of its impact began to be felt as the company moved to the second stage of the transformation process: the search for the right BM.

Business director perceived a holistic change in the company:

“When we realized that service-based business logic matched better to the value promise of our new solution, we began to understand what constant value generation and capturing requires from our company, support services, sales, metrics, and just about everything else.” (BD, Beta)

Also, a cognitive change was noted during the experimentation in proof-of-concept:

“Commercial and business know-how and the lack of them came to the fore more and more as we found that our value proposition was changing. All that testing and learning helped us to understand many things again and more broadly.” (BD, Beta)

Beta built and discussed the new BM and its implications, both internally and with customers, to find the right elements for different parts of the BM. The first version of the BM often took shape through iterative ideas, and the process of change began to move into the implementation phase, which is still ongoing to this day. A service director mentioned that learning by doing is probably the only way to get this change done at some point in time:

“We didn’t have competencies or knowledge, but we can learn them by doing or from the customers, and that is [an] important part on our transformation process.” (SD, Beta)

The launch of a new model for all customers, both old and potentially new, is currently underway, and some small things still need to be modeled before the large outward-looking phase of deployment begins on a large scale. One service director thought that still there would be many iterations after official launch:

“Only after we get large amounts of new service sold [will] we begin to really understand what works and what doesn’t. In addition, we collect data on what is actually happening to customers, what our time and resources are being spent on, whether the metrics we use are even close to what should be measured, and whether customers are getting value for their money. This implementation phase is really only the first step on the path to continuous change.” (SD, Beta)

The current CEO stated the next steps similarly:

“The technical solution works, everything else is uncertain. It will take a long time for us to train sales, stack materials, set the right metrics and acquire new skills. But this is part of the constant change we learn and develop every day.” (CEO, Beta)

The complementary perception of a business leader (BL) describes how other parts of the organization are likely to have to change as well. Through that, the introduction of a new technology really affects the entire company in the long run:

“If there is a situation that two salespersons who sell equivalent solutions to customers, one with a traditional project model and the other with a new service model. The other gets better compensation of this or the metrics prefer one of these, it is clear that things indirectly related to [the] new business model must also change. In continuous value creation and capturing, management must also change.” (BL, Beta)

Beta employees stated in many interviews that the new technological solution was in use with some customers and ready for use among all other customers, but the service-type BM for the internal organization was far from complete and would still have to change many times. A business director envisioned,

“This is going to fundamentally change the structures of our organization as the earnings logic changes, the company’s customer segments change, the company profile changes and everything from communication to skills needs seeks a new direction.” (BD, Beta)

A project engineer supported this opinion by saying:

“I have learned that [not] all people are . . . as good at change, and our business is changing so radically logically, it is likely that many of the roles need to be changed.” (PE, Beta)

The CEO expressed optimism:

“It may be that even with old ways or models that we have not yet noticed, we are preventing the realization or full utilization of something good in our new business model. I believe that these things will be improved and changed for a long to the future.” (CEO, Beta)

After getting the technological solution into a viable and sufficiently good phase for customers, Beta planned to continue to drive change, stabilize its economic and cognitive BMs and communicate the whole to the customer base. Methods for stabilization would include increasing technical expertise, updating marketing and communications to fit the new BM, educating customers about the new value proposition and lifecycle model and updating management methods to suit continuous service production and lifetime customer relationships.

None of the interviewees thought that the execution and success of the technical solution was the biggest or most challenging part of the change, although it was the only part of the change that was actually ready at the time of

this study. Figure 9 shows that the change started in 2017. Now, at the beginning of 2020, the implementation phase of the transformation is underway and will continue. The introduction of new technology triggered a process of change in the holistic BM that led Beta to search for a new cognitive and economical BM.

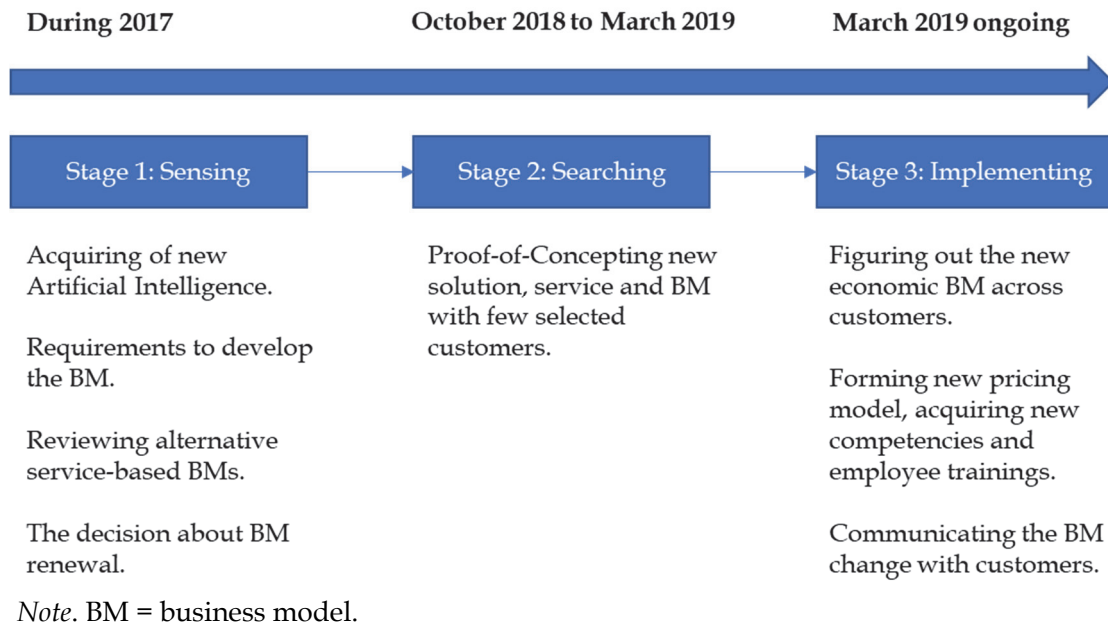


FIGURE 9 Timeline of Beta's business model transformation.

3.6.2 Inertia in Beta's business model transformation

Interviewees from Beta described the inertia factors in the different stages of the BM transformation as follows: during the sensing phase, the main retarding factor was sociocognitive inertia, which prevented faster decision-making and thus project prioritization along with financial support. In the same stage, the company also noticed the first signs of economic inertia. In the second phase, the searching stage, economic inertia emerged even more strongly, although sociocognitive inertia continued to play a key role, and various forms of psychological inertia began to emerge. In the last stage of implementation, psychological and economic inertia were seen as key challenges, but the effects of sociotechnical inertia were still seen. In the following section, we present the results related to the slowness experienced in changing Beta's BM in the second case study. The types of inertia factors observed and their effects are shown in Table 8 (presented later in this Section).

In the early stages of the change, there was an idea regarding leveraging new technology, but the new opportunity that emerged from the core team needed the support and funding of the company's management to succeed. There were two types of challenge for company management in describing new technology, modeling the value proposition, creating the belief that it is worth investing in the new technology and embarking on development work: (i) dialogue and understanding of a new business opportunity and (ii) resources and

financing. The CEO even saw himself as one of the slowdowns in the early stages, along with other top management:

“I also didn’t personally understand what we [were] supposed to do and was it really worth the investments. Although there were discussions with the core team, with lack of understanding, I cannot easily go to the management team to present the idea or gather support it.” (CEO, Beta)

“I think overall, the dialogue on such a fundamental change should be much deeper, broader and there should be [many] more discussions between the core team and management. If technically savvy engineers try to explain the value proposition of a new service in their own terms to senior management, there is not even a common language, so there cannot [be a] consensus in understanding.” (CEO, Beta)

This view was complemented by the business director’s description:

“Without a coherent and solid understanding of management and thereby sufficient financial and human resources, such a transformation cannot succeed. If there is no prioritization for the project, I believe that there is a lack of commitment behind that.” (BD, Beta)

All interviewees felt that they had sufficient technical understanding to carry out the project together with a skilled subcontractor. This is illustrated by the CEO’s statement regarding having sufficient technological know-how to acquire good enough technical know-how:

“We did not have hands-on knowledge of artificial intelligence or machine learning. But we had enough technical know-how to buy this from a suitable contractor in our business network.” (CEO, Beta)

The service director supported this by stating,

“While technology has never been a problem for a technology company like us. I still believe that only three to five persons of our core team really understood what was being done and what it was all about.” (SD, Beta)

In the searching stage, the implementation of the technical solution together with the customer and the subcontractor led Beta to outline a new BM and related elements. Actually, from the searching stage to today’s implementation stage, Beta management has faced economic inertia, while sociocognitive inertia has continued, and psychological inertia has also begun to take shape.

There was a concern about customers’ ability to understand the new technological solution and its value proposition. In addition, at Beta, solution deliveries changed in both pricing and logic to a lifecycle model, which meant that not all customers wanted or knew how to buy solutions from Beta in a new way. In conclusion, a situation in which a customer is offered something they may not fully understand (especially if the salesperson does not have all relevant arguments to convince the customer) and the sales model is not similar to the previous one and may not fit the customer’s acquisition ideas, may be a failure.

In addition to this, inertia was found in many forms in the searching stage, like sales, communications and marketing, and the need for everyone involved

in implementing a new service BM to understand how it differs from the previous BM.

Focusing on the technology, not to the proven business value, may prevent the success of Beta's new BM. A project specialist (PS) highlighted,

"We need to provide successful demos for our customers and show the business value, not go there and explain that we have the latest AI-based technology." (PS, Beta)

The service director envisioned,

"In fact, we should sell the work of what our solution does and thereby add value to our customers' own business. I do not think the customer should be terribly interested in what technology or how advanced a technology we will use when the work is done efficiently and with high quality. If we do not understand this, then the customer is unlikely to know how to buy a solution from us." (SD, Beta)

The CEO also raised the need to train all other indirectly engaged employees:

"I feel that the biggest challenges we have and will have is the training of those employees who are involved in the service-base business but have not been involved in this from the beginning and now they are needed. The first is to train sales and marketing as well as support staff. But yes, this will also change management practices and the metrics we use. These all slow us down, and there is a lot of work to be done." (CEO, Beta)

However, during the searching phase, some respondents saw that issues other than the implementation of the BM itself posed greater challenges and delays. Some of the challenges were forms of sociocognitive inertia or psychological inertia directly related to staff. The business director forecasted,

"Some people may not be able to change on a suitable schedule or want to change at all, so we will likely have to switch several people from one task to another." (BD, Beta)

A project manager observed,

"Not all people can be educated. Or it can be but it will be too long a road and when we sell a lifecycle service, we have to get the continuous service production running right from the start without any major worries so that the customers are happy with the new model." (PM, Beta)

The CEO expressed that

"Yes, this will also change our organizational structure, which will lead to resistance to change from many business units. On the other hand, we cannot help but do this, so we look for a way one step at a time." (CEO, Beta)

In the searching stage, economic inertia played a significant role in assessing the impact of the new BM on the entire operation. The CEO put forward a rather holistic view of economic inertia:

“If we don’t have the expertise for a service-based business, we don’t know what customers are willing to pay, we don’t know what the real cost of lifecycle services is, and we don’t even have the metrics or motivators for people to participate fully, there is a clear inertia to a viable economic model. Before it can really be said that the change has gone through and has been successfully implemented in the organization.” (CEO, Beta)

The service director voiced support for this:

“We do not yet have expertise in really anything related to a service-business perspective, we can’t plan this in advance. You need to collect data and iterate the business model throughout the planning and launch.” (SD, Beta)

The only phase in which technological inertia was observed by the Beta respondents was the implementation stage. In this stage, the new technological solution must be compatible with previous solutions, although this was seen only as a technical challenge, which may not be a significant challenge for such a technology-oriented company, as the business director described:

“Technical compatibility can always be solved in one way or another. We need to keep this in mind, of course, but fixing it is not a problem, only money and time.” (BD, Beta)

The main types of inertia observed in Beta’s transformation process and their symptoms and sources are listed in Table 9. These classifications suggest that the main type of inertia in the sensing stage is sociocognitive inertia. In the searching stage, it is economic inertia, and in the implementation stage, psychological inertia. It is noteworthy, however, that economic inertia also occurred strongly in the first stage. In addition to economic inertia, sociocognitive and psychological inertia also occurred significantly in the searching stage.

In summary, sociocognitive inertia in the case of Beta seemed to hinder management engagement, decision-making and access to financial support for the transformation process. Economic inertia, on the other hand, prevented the development and implementation of the full service-based BM for customers. It is notable that the organization-wide implementation was just beginning, and all its effects could be assessed mainly by the effect of psychological inertia.

TABLE 8 Classified inertia factors in Beta’s business model transformation.

Process stages	Stage 1: Sensing	Stage 2: Searching	Stage 3: Implementing
The main types of BM inertia	Sociocognitive BM inertia.	Economic BM inertia.	Psychological BM inertia.
Observed BM inertia: Sources and symptoms	The understanding of new technology and its value proposition, communication and lack of service-based business logic hindered the decision about the new cognitive BM.	Uncertainty of how to set the price point correctly, how to augment lifetime value for customers and all other unanswered business-related questions generated uncertainty of the economic BM.	Employees and managers at different levels felt that the change did not affect them and that they were not part of the transformation execution.
	The project was led by technicians, so it lacked all business-level understanding.	Lack of business-level understanding and know-how about service-based businesses.	Lack of understanding and unwillingness to change in Beta’s organization.

Note. BM = business model.

3.6.3 Discussion of Beta’s case study

In the case of Beta, the change in the BM was illustrated by highly technology-driven thinking, which involves other elements of the BM transformation process and related challenges and problems. Each of these factors of inertia, alone or in combination with others, slows the progression of development and change. The logic of Beta’s operations and value promise was changed by building a technical implementation equipped with AI, the only delivery model of which was service-oriented delivery, which differs in many respects from the previous project and delivery-type value-added logic and revenue model. This led to a lot of conflicting issues internally in terms of expertise, implementation and expectations.

In addition, the change in the external environment, for example, the involvement of an external contractor in the development stage, changed the customers’ sales model, lifetime value and pricing, so the internal and external issues of the BM were interconnected. In other words, the variation between individual elements of the new BM was clearly different. According to our interpretation, Proposition B1 (connections between the BM elements) and Proposition B2 (alignment as the goal of the transformation process) can be combined here. It can be stated that when change starts from one element of a BM, other elements connected to it will also change, and thus the whole BM will change. Changing one element of a BM leads to an imbalance in the BM.

As in the case of Alpha, it was clear that Beta could not plan its BM transformation beforehand or predict what the end result would be like. Thus, one changed BM element changed another, and so on. This means that the entire

BM transformation is basically achieved piece by piece, iteratively, and by actively looking for suitable increments.

As the interviews with Beta employees revealed, many variations of sociocognitive and economic BMs are possible, but the way to get it right is to gather customers' experiments and feedback. Beta's ten-year history of project-type BM operations showed that the process of transformation was very different for an incumbent company than a start-up or a company creating a completely new BM in addition to an existing one when there is no need to actually change something that already exists. When a new technology solution provider (like Beta) pays hundreds of thousands or millions of euros, a good business opportunity cannot be pulled back if the existing BM prevents or slows down the transformation process. All barriers and problems need to be solved.

In the case of Beta, different stages of the BM transformation involved different inertia factors. This follows very much the same structural formula as the case of Alpha. In Table 9 (presented later in this Section), we combined the literature and Beta's empirical findings to provide a comprehensive conceptual schema for how the inertia of BM change can be illustrated and analyzed at different stages of the transformation process. This combines Proposition B3 (process stages in BM transformation) and Proposition B4 (different types of BM inertia) on the changes of changing a BM and the inertia factors associated with these steps.

First, the conceptual schema defines three stages for BM transformation: (i) The sensing stage, designed to identify signals of market and technological development in the external environment and to develop a cognitive BM to decide to start changing the BM. (ii) The searching stage, which involves testing the cognitive assumptions and ideas of a BM, conducting various experiments, and thereby modeling an economic BM. (iii) The implementation stage, which involves the actual implementation of a viable economic BM throughout the customer base and in the organization itself.

Second, the conceptual schema includes the four main types of inertia factors listed earlier and how these relate to the different stages of the transformation process and the cognitive and economic BMs. Beta's interviews showed that, in the sensing phase, the ability of managers to understand the new technology being utilized and its impact on the new BM being developed is limited and thus results in sociocognitive BM inertia. If managers do not understand all the issues in the new BM and change well enough, they cannot lend their support or know-how to decisions, thereby delaying and preventing the progress of change.

The purpose of the searching stage is to find a cognitively and economically viable BM that suits the market environment. In the case of Beta, achieving the objectives of this phase slowed down for several reasons. First, other than the technological core team, very few in the company really understood what needed to be done and what needed to change. Regarding the management and sales functions, it became more difficult to decide on new metrics and, for example, a proper pricing model for the service. These had a retarding effect on the

discovery of an economic BM. In part, it seemed that the new BM was not yet agreed upon completely, even at the implementation stage.

In addition, feedback from the customer field and experiments regarding the difficulty of purchasing a service model for a lifecycle, estimating actual costs and benefits and producing continuous service delivery across all operations make it difficult to decide many of the BM's key elements. So cognitively, BM was not yet fully agreed upon at this stage either, which directly slowed the progress of change. Thus, there were enough challenges in almost every direction, covering both the validation of the cognitive BM and the continuous development of the economic BM toward a profitable and viable business. At this stage, other parties were already involved in the formation of the core group, so the first indications of psychological inertia were also found.

The final stage of implementing a new BM involves standardizing and implementing the new model throughout the organization and for all customers. In the case of Beta, it was clear that several other business units had a long history and moving toward a service model could raise psychological resistance that would slow the transformation. While the company collected evidence of the functionality of the economic BM from customer deliveries and developed metrics, psychological inertia risked hindering implementation if suitable indicators of the performance and success of the new model could not be presented to slow the resistance.

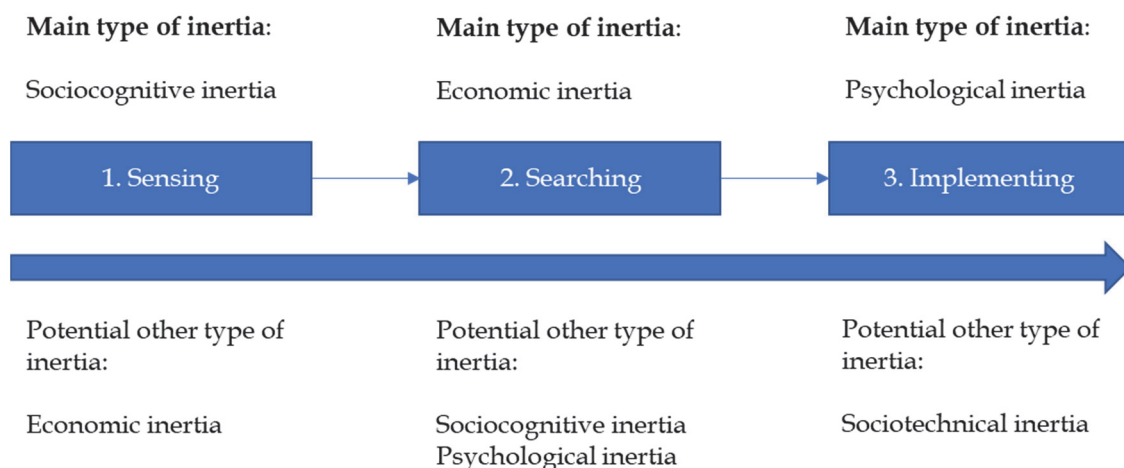
Third, the frame lists possible secondary types of inertia at different stages of the process. One form of sociotechnical inertia is the inability to understand how new technologies are applied as part of a business, that is, as a piece of implementation of a BM and value proposition.

To summarize, Table 9 contains the conceptual and key elements of the analysis of Beta's BM. Finally, Figure 10 shows the primary and secondary factors that slowed down the change in BM in this case. The key concepts and inertia factors of this case study help to identify and analyze the various reasons why the transformation process may not proceed during the change process. The first step for companies struggling to move forward is to identify the change and then remove identified barriers through decisions and actions.

TABLE 9 A conceptual schema for analyzing Beta’s business model inertia.

Process stages	Stage 1: Sensing	Stage 2: Searching	Stage 3: Implementing
Target for development	Cognitive BM.	Economic BM.	Economic BM.
Main type of BM inertia	Sociocognitive BM inertia.	Economic BM inertia.	Psychological BM inertia.
Potential other types of inertia	Economic inertia.	Sociocognitive BM inertia, Psychological BM inertia.	Sociotechnical BM inertia.
Sources and symptoms relevant to analyzing BM inertia (incl. but not limited to)	Managers decline new ideas due to a lack of knowledge. Managers are unable to decide on the new BM because of technical and economic uncertainties. Lack of consensus among the core team due to missing communication and too much technical language used.	Managers are unable to make a pricing decision, cost analysis and set metric because of inadequate knowledge about new service-based business logic and continuous value generation. Due to the changed value proposition and pricing model, customers are more likely to be skeptical about the new BM.	Employees oppose change or new technology owing to the inability to perceive the benefits. Employees’ lack the readiness to change because of missing proof that the new BM is worth of chance. Organizational inflexibility for change due to the wrong people in key roles.

Note. BM = business model.



Note. BM = business model.

FIGURE 10 Analyzing Beta’s business model transformation inertia.

Just as in the case of Alpha, the factors that slow down BM transformation were identified in Beta on the basis of symptoms. However, acting on symptoms is always reactive, with challenges are being corrected after they are noticed. According to our model, the first step in dealing with inertia factors is to identify them and thereby treat them. However, Beta had already started the technical implementation in the sensing stage, hiring a third party directly to implement the technical solution according to Beta's instructions. From this, it could be quickly concluded that the comprehensive training of our own staff for the development of the new solution could have taken even longer than it did now. Thus, the internal learning process could have been slow and expensive without guarantees of a sufficiently good qualitative end-customer solution.

From this point of view, it can be understood that many other factors of inertia can be tackled in advance. In the interviews, Beta managers said that if someone had told them in the beginning that they should consider these kinds of inertia factors, they could have saved perhaps two years of transformation process time.

3.7 Case study comparison

The cases of Alpha and Beta are quite similar. Both of the changes to BMs were very clearly triggered by a technology-driven approach, but technology itself has never been the biggest challenge of the change. Both of these case studies highlighted the most sociocognitive retardations in the first stage of the transformation process. By their nature, these changes were also remarkably similar, from the understanding of top management to the communication and uncertainty about numerous factors. The second stage of the change process was also almost similar in both cases, with economic inertia playing a major role. Likewise, the final stage mainly involved psychological inertia. However, both firms emphasized that the transformation process cannot be planned in advance and that their legacy know-how was not enough to foster the transformation.

It should be noted that, in both cases, the three stages presented by us were clearly identifiable in the change process, and the inertia factors were successfully identified in stages based on the interviews, although it was clear that secondary inertia factors were also found in each stage. In practice, there was more than one type of inertia found in each stage of change, and each respondent also identified inertia at each stage. Alpha, which considered itself more as a sales organization, quantitatively raised the importance of metrics and compensation models in change, while Beta placed more emphasis on the role of expertise and understanding at the company level. Both companies emphasized the need for communication and training company-wide, and they were both concerned about their customers' reaction, readiness to buy and sociocognitive or psychological inertia.

There are also other differences between these companies. Where Alpha hired external experts to build the business, Beta hired external experts to

implement the technical solution. This had no significant effect on the amount of inertia in either case, but based on the interviews, the proof-of-concept phase was almost twice as long for Alpha, which leveled off with the first phase contribution that Alpha made in few months. In short, between these two technology-centric companies, which had been in business for decades, the slowdowns in the change process were very similar. Although the companies did not operate in the same industry, they were the same size and conducted their business using technologies.

3.8 Conclusion of the case studies

In this chapter, we used two case studies to examine and synthesize the literature available about BM transformations and forms of inertia that hinder the process. We empirically investigated how BM inertia manifests in a BM transformation case. We asked how to recognize and solve the inertia associated with the BM transformation (RQ). To address this question, we proposed a conceptual schema of BM inertia (for Alpha and Beta) that managers and scholars can employ to identify and analyze BM inertia. After identifying the symptoms of BM inertia, managers and scholars may develop the means to eliminate the sources of BM inertia and advance with their decisions and activities.

In the two case studies, managers guiding their companies through BM transformations had to overcome several types of inertia to exploit the value of digital technologies the companies had acquired. Therefore, the present study is one of the many recent studies to argue that the value of digital technologies can be harnessed by combining its introduction with changes to a firm's BM. However, this is the first study to investigate troubled BM transformations and to focus on an analysis of the inertia present during the transformation process.

To pinpoint the theoretical contribution of the present study, we consider the recommendations of Osterwalder and Pigneur (2013). They found that IS research could contribute to work on BMs by developing and validating conceptual schemas, models and instances. They highlight the process of coming up with an entirely new and viable BM. In addition, we see room for studies aiming to capture processes and principles of implementing the transformation and stabilizing the BM after major changes. Against this objective, the present study provides a useful contribution by positioning BM transformation as an organizational change and accordingly developing four propositions about the outcome, process and inhibitors (not the drivers) of the BM transformation.

First, we propose a definition of the BM concept, which combines the sociotechnical system with the value creation and value capture logics. This interpretation facilitates theory development about the role of IS in BMs.

Second, we propose that BM transformation aims to turn the envisioned cognitive BM into a profitable economic BM and that the main objective of the BM transformation is to find an aligned set of reinforcing BM elements. This proposition supports developing theories of BM transformation in which the role

of human agents, their cognitions and actions as well as organizational characteristics of enabling or constraining technology-induced changes are considered.

Third, we propose a view of the BM transformation process as a time-limited and punctuated change. This view has three process stages for sensing, searching and implementing a new BM. This proposition facilitates theory development concerning the specific outcomes, tasks, drivers and inhibitors for the different stages. Finally, we propose a novel conceptual schema about BM inertia, which provides a detailed account of the properties of sociocognitive, economic, sociotechnical and psychological BM inertia. The notion of BM inertia challenges the prevailing view of BM development and innovation as a straightforward stepwise or iterative process. The proposed conceptual schema, therefore, provides a reasonable starting point for novel theory development about troubled BM transformations in which the process is decelerating or not advancing at all, is advancing in an unintended manner or is producing unintended results.

Regarding the implications for research and limitations of the present study, the proposed schema of BM inertia is based on our literature review and a single case of BM transformation, which means the schema should be validated and enhanced in further studies. We, therefore, encourage researchers to apply and develop the proposed schema and its details under various boundary conditions further to provide accounts of various sources and symptoms of BM inertia. Also, we find developing instructions for tackling the inertia as the logical next step for research. In our opinion, the instructions should include both precautions to avoid inertia and remedies to tackle arising inertia.

With respect to the practical implications, the present study provides numerous insights into troubled BM transformations. We can, therefore, argue that the results of our conceptual and empirical investigation and the resulting conceptual schema of BM inertia suggest best practices for analyzing troubled BM transformations. Understanding the types of BM inertia that can appear along the transformation process and the qualities of BM inertia can help managers, executives and entrepreneurs to identify sources of inertia and apply interventions and countermeasures to eliminate inertia. This allows decisions about the cognitive and economic BMs to be made and advances the BM transformation process.

In conclusion, the proposed model has implications for future research on BMs. It encourages further examination to connect the model with practical insights to help practitioners to respond effectively to factors that slow down or inhibit progress in BM transformations.

4 DISCUSSION

In this section, the outcomes of the earlier sections are summarized, and the discussions of the literature and the case studies are outlined. Implications and limitations of this study are then introduced. Finally, the conclusion addresses the research question.

4.1 Summary of the literature review

In this subsection, the findings of the literature review are presented. We proposed a three-staged transformation process for BM change. However, we did not manage to differentiate this model between start-ups and incumbents. The variance between incumbents and start-ups is a result of the internal and external contexts that impact their ability to move from one stage to another and to execute transformational tasks. This understanding indicates questions around alignment and matching BMs and BM elements to internal and external environments.

Technological innovations, along with changes in competitive environments, are seen as two of the most crucial triggers for BM transformation. Technological innovation is generally available to every company, so companies can achieve competitive advantage by transforming their existing BMs faster than their competitors. The sensing stage requires business decision-makers to pay attention to potential technological innovations that may disrupt existing BMs or value propositions in the business landscape. These technologies are all potential sources of uncertainty or misalignment of BMs when utilized incorrectly. For instance, a new technology-based improvement for a BM value proposition might generate a large number of support tickets or customer requests for another element of the BM and so on harm the sustainable economic model. Another example is the existing key performance indicators (KPI), which are used to measure implemented technical innovations in individual elements of existing BMs. For many companies, the present KPIs are not suitable for

monitoring changed BMs and may focus attention in the wrong direction or point to completely false root causes behind these indicators.

In the second stage—searching—organizations look for potential cost-effective BMs with different sets of BM elements. Companies must find the right technological resources, capabilities, and new value propositions for the market by experimenting with and learning about different aspects of the new model. If this stage is not done correctly, the end result might be a situation in which customers are not familiar with the new offering or, at worst, the value proposition is something that they do not want at all. This example also highlights the importance of external alignment. In the case of a radically changed BM, internal misalignment may also arise from multiple sources, such as a situation in which an employee compensation model that does not support the new model, employees are not motivated to foster new experimentations or the organization structure is not aligned with the new model.

In the implementation stage, organizations push for organization-wide execution of the new BM. The period of time is much longer for this stage, and new forms of inertia are encountered.

In addition to these practical findings, the literature review revealed many potential sources of inertia in BM transformation. We classified these sources into four categories: cognitive, economic, technological and organizational. In short, cognitive inertia is the inability to understand new BMs. Economic inertia is due to a desire to stick to the existing BM from an economic point of view. Technological inertia refers to technological barriers to implementing new BMs. Organizational inertia involves organizational-level factors, like organizational structure, compensation models and so on. Any number of these forms of inertia may exist in any stage of transformation, but we assumed that cognitive inertia is mostly recognized in the sensing stage, economic and technological inertia in the searching stage and organizational inertia in the implementation stage.

4.2 Summary of the case studies

In this subsection, the findings of the cases are presented. Our case studies synthesized and implemented findings from the literature about BM transformations and inertia preventing the process. We empirically investigated how BM inertia appeared in a BM transformation case. In the case studies, the managers executing BM transformations towards completely new BMs, parallel to their existing business, had to overcome multiple different types of inertia in each stage of the process. The beginning of BM change was rather easy if considering only the acquired new technological solution that needed to be implemented into the existing business environment.

Technological solutions are fairly easy to find and purchase, but organizations must be able to utilize them correctly in their BMs. Companies have to combine the value of digital technologies with innovative BMs. This leads companies to the BM transformation process. We believe that in every incumbent

company, there is some sort of inertia. This indicates troubles in all transformation processes, no matter what BM transformation process a company uses. Time and effort can be taken up by a slow transformation process if factors of inertia are not considered from the earliest phase of transformation.

Decision-makers in one of the case studies quickly realized that transformational change is not smooth, simple or fast. They faced inertia from many directions, feeling that they did not understand the new model themselves or did not know if it was something their customers really wanted. Creating a new value proposition using technology led to various misalignments between technology, the new value proposition and many other elements of the decision-makers' existing BM. Interviews revealed that each responder encountered different forms of inertia related to their own responsibilities. By tackling these symptoms one by one, the organization wasted its time and a lot of money.

4.3 New contributions

Understanding the many distinct aspects of the transformation process is vital when transformation does not advance or proceeds slowly. Clearly, the BM transformation process cannot be considered a straightforward, easy-flowing process. Existing research lacks an important viewpoint regarding this matter, although it is realistic that all transformation processes do not succeed.

In the literature review, we simplified the model for the BM transformation process to a three-stage model and utilized it in two case studies. We found that the transformation model did not have to be multilevel, multiphase or complex even in enterprise-level organizations, unlike the existing literature expresses. For many companies, the available transformation models may appear too complex or heavy. Often, less is more, and simple is beautiful.

One major contribution of our work is its emphasis on considering the inertia factor in the transformation process. We recognized many factors of inertia and classified them according to four categories. Summary of found inertia factors are visualized in Figure 11. Still, many inertia factors remain unidentified and hidden. Regardless of our (likely incomplete) list of inertia factors and possible lack of comprehensive classifications, our study provides evidence of the many reasons why organizations might resist BM transformation and why change might not advance even if there is a clear decision to change. This new viewpoint will help other researchers to explore the root causes of failed transformations and develop more targeted best practices to prevent such challenges.

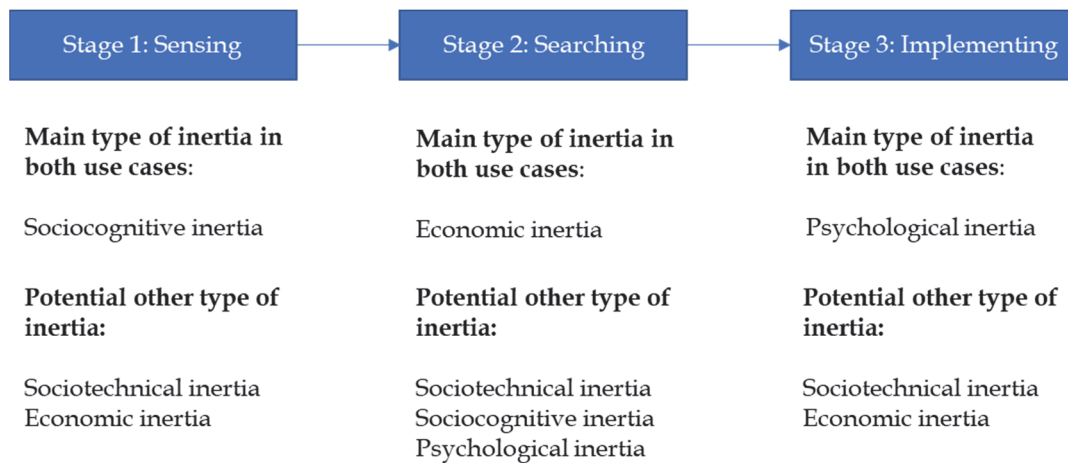


FIGURE 11 Summary of inertia factors in case studies.

4.4 Implications for further studies and business decision-makers

In a constantly changing world, the ability of companies to change successfully is becoming a key competitive factor. Technologies are one of the key triggers for BM change; rapid development of technologies calls for rapid change for BMs. The utilization of technologies in BMs leads to a continuous change in BMs, so change must succeed, or companies may risk falling behind and losing their competitive edge.

The current literature does not help business decision-makers succeed in the way they should. It presents change as straightforward and always successful. In addition, numerous complex and more varied models of change do not comprehensively consider factors that can prevent or slow down change. The change process is also typically customized for each individual company. Our research opens the door for companies to see the challenges of change more broadly and possibly anticipate potential problems. However, more research and best practices are needed to address these issues.

There are dozens of different studies of the BM change process and different change models in the current literature, and almost all of these have been done on a case-by-case basis at a given point in time and by one company. We followed same logic and produced new understanding of two case studies and instead of developing new model of change, harmonized few versions of existing models into a simple three-stage model. In our understanding, describing a change in a BM often does not need to be as complex and customized as it often is today. We hope that our simplified transformation model will be used to deepen, not necessarily expand, BM transformation research. There is certainly a difference between start-ups and mature companies as well, which is not comprehensively covered in the current literature.

In addition, by focusing more on why things are not happening, researchers can identify entirely new competing forces in the business world. Businesses also benefit directly from an understanding of what distinguishes successful change from failed change and the factors that influence a vital change process. The fact that our research has identified and categorized barriers to sociotechnical, sociocognitive, economic and psychological inertia is probably not enough to understand all possible reasons for troubled transformations. Thus, more research must be done to expand and deepen our understanding of potential sources of inertia and how to overcome these factors. However, this is still the first step towards best practices for reducing hold-ups and barriers. In this direction, the concentration of research, generation of knowledge and building of practical activities will serve both research and business.

4.5 Limitations of the study

Like every study, our study has some limitations. The study was conducted as two individual case studies of two incumbent companies from Finland; it requires the support of other studies on the same topic. Like all research based on case studies, our study needs validation studies from other industries, different size of companies and from other countries. In addition, it is noteworthy that current research on BMs is taking place on many fronts and at many angles, so it goes without saying that the literature review presented in this study may lack some of the key studies conducted in recent years.

The content of the study and the simplified transformation process may also have limitations to their applicability in different companies and industries. This could be especially relevant if attempting to implement them outside of the IT or technology industries and in companies of different sizes. This study involved midsize companies, so the transformation processes of small and enterprise firms may be very different. Thus, the results of this study may not be directly applicable to other industries, companies of different sizes or other countries. And should be noted, however, that similarities can also be found in startup companies even though they were not studied in this study. The inertia factors may also differ from those observed in this study. It is also to be expected that other factors of inertia will certainly be found in other researches and can be classified in a number of other ways that help to understand why BM transformation does not proceed.

5 CONCLUSION

The aim of our research was to build a literature review of what is known about business model change processes. According to the literature review, BM change has been studied extensively. There is a general understanding that BM innovation is a better competitive factor than, for example, technologies that can be easily copied or replaced by new and better technologies. It should be noted, however, that models for changing BMs are currently very different and even difficult to utilize. However, it is noteworthy that, based on the literature, each technology-triggered transformation leads to a change as the existing transformation models describes. We assumed that not all BM transformations can be as easy and straightforward as the literature suggests but there could also be a situation where, despite the decision to change, change does not proceed.

In the literature review, we built on existing models from our own simplified three-tier model for change, which included three steps: sensing, searching and implementing. The first step, briefly described, is to build an understanding of what is happening in the company's external business environment and which changes are likely to affect its current BM. The second step is to experiment and pilot a new, viable BM that will eventually be implemented in the third step. Our simplified model worked well when it was used to investigate the barriers to BM change in the second part of this study. In the literature, we also looked for factors that prevent change, but only a few references were found. No complete study has focused on the barriers to changing BMs. Based on this, we came to the conclusion that there is a variety of inertia in change processes and that change is not always as clear and successful as the literature suggests.

In the second part of our study, we used case studies and open-ended interviews to examine the transformation of two midsize incumbent technology companies from hardware and software businesses to service businesses and the challenges associated with such a transformation. The results of the studies were modeled according to our own three-step model mentioned above. The barriers identified in the interviews were categorized into these different steps. In the first sensing phase, companies were likely to encounter sociocognitive and

sociotechnical inertia. During the searching phase, companies suffered economic, sociotechnical and psychological inertia. In the final deployment phase, they experienced psychological, sociotechnical and economic inertia. It is noteworthy that almost all forms of inertia were found at every step of the transformation process, and there was some form of inertia found in every step. In light of this understanding, it is difficult to accept the view offered by current literature that the process of change is a clear and straightforward execution that always succeeds.

It is important for business decision-makers to identify and resolve all potential barriers to change, at best, even in advance. Our simplified three-step change process model can help leaders to simplify the change process and to view the change in clear steps. The identified inertia factors, in turn, indicate that there are obstacles and barriers at every stage of the change model. This is the opposite view from that presented by the existing literature. Based on the literature review and the case studies conducted, we argue that changes to a BM triggered by technology can be slowed down by multiple sociocognitive, economic, sociotechnical, and psychological inertia factors.

YHTEENVETO (SUMMARY IN FINNISH)

Teknologiat toimivat usein olemassa olevien yritysten liiketoimintamallien muutoksen käynnistävänä tekijänä. Yrityksillä on samat teknologiat tarjolla yli maiden rajojen pilvipalveluiden ja muiden ratkaisuiden kautta, joten on selvää, että teknologioista saadaan vain hetkellistä kilpailukykyä. Teknologioiden avulla voidaan kuitenkin innovoida täysin uudenlaisia liiketoimintamalleja, joissa näitä uusia innovaatioita hyödynnetään ja liiketoimintamallien kehittäminen tuottaa pidempiaikaista kilpailuetua ja vaikeammin kopioitavia kokonaisuuksia yrityksen kilpailueduksi. Näin ollen, uusi teknologia usein muuttaa joko suoraan tai välillisesti olemassa olevaa liiketoimintamallia ja käynnistää muutosprosessin. Liiketoimintamallia on siis osattava muuttaa oikein ja tehokkaasti, jotta aika ja resurssit eivät huku muutokseen, joka ei välttämättä edes etene.

Tässä tutkimuksessa ensiksi rakennettiin olemassa olevan kirjallisuuden avulla ymmärrys, miten liiketoimintamallin muutosta kuvataan ja tämän avulla muodostimme kolmivaiheisen liiketoimintamallin muutosta kuvaavan prosessimallin. Mallin ensimmäinen vaihe (sensing) on tarkoitettu tunnistamaan mahdolliset muutoksen käynnistävät tekijät. Toinen vaihe (searching) on oikeanlaisen uuden mallin kokeilua ja opiskelua. Kolmas vaihe (implementing) on viedä toisessa vaiheessa löydetty malli koko yrityksen laajuisesti käytäntöön ja alkaa tämän kautta tekemään uudenlaista liiketoimintaa. Liiketoimintamallin muuttaminen on siis kokonaisvaltaista, eikä yhden yksittäisen elementin muuttamista. Mikäli yhtä osaa olemassa olevasta liiketoimintamallista muutetaan, voi muutos aiheuttaa epätasapainon elementtien välillä ja näin ollen koko liiketoimintamallin on muututtava.

Lisäksi olemassa oleva liiketoimintamallien muutosta käsittelevä kirjallisuus näkee muutoksen suoraviivaisena ja sujuvana prosessina, joka alkaa, kun laukaiseva tekijä tälle näyttäytyy (tässä tapauksessa teknologia). Kirjallisuus ei kuitenkaan esitä tilannetta missä muutoksen käynnistävä tekijä on tunnistettu ja on päätetty lähteä muutosta toteuttamaan mutta silti muutos ei etene. Yrityksissä on siis erilaisia tekijöitä (inertiaa), jotka hidastavat tai jopa kokonaan estävät liiketoimintamalleja muuttumasta. Liiketoimintamallien muuttumisessa on meidän näkemyksemme mukaan aina jonkin asteista vastustusta tai esteitä. Näitä inertian muotoja tunnistimme useita, jotka luokittelimme neljään kategoriaan: sosio-kognitiivinen, ekonominen, sosio-teknologinen ja psykologinen. Näitä kaikkia inertian muotoja voi ilmetä missä tahansa muutosprosessin vaiheessa. Tämän tutkimuksen analyysi kirjallisuudesta ja toteutetusta tapaustutkimuksesta haastavat olemassa olevan käsityksen liiketoimintamallien kitkattomasta muuttamisesta. Liiketoimintamallien muutosta hidastavat sosio-kognitiiviset, ekonomiset, sosio-teknologiset ja psykologiset inertian muodot.

Mikäli muutoksen esteitä ei yrityksissä tunnisteta, voi liiketoimintamallien innovaatioista haettava kilpailuetu jäädä haaveeksi. Tämä tutkimus avaa ovia ymmärtämään miksi liiketoimintamallien muutos ei tapahdu ja millaisia inertiatekijöitä organisaatioista voi löytyä.

REFERENCES

- Achtenhagen, L., Melin, L. & Naldi, L. (2013). Dynamics of business models – Strategizing, critical capabilities and activities for sustained value creation. *Long Range Planning*, 46, 427-442.
- Al-Debei, M. M. & Avison, D. (2010). Developing a unified framework of the business model concept. *European Journal of Information Systems*, 19 (3), 359-376.
- Al Humaidan, S. & Sabatier, V. (2017). Strategic renewal in times of environmental scarcity: the mediating role of technology in business model evolution. *Journal of Organizational Change Management*, 30 (1), 106-120.
- Amit, R. & Zott, C. (2001). Value creation in e-business. *Strategic Management Journal*, 22 (6-7), 493-520.
- Andries, P., Debackere, K. & Van Looy, B. (2013). Simultaneous experimentation as a learning strategy: Business model development under uncertainty. *Strategic Entrepreneurship Journal*, 7, 288-310.
- Antero, M. C., Hedman, J. & Henningsson, S. (2013). Evolution of business models: A case study of SAP. In *ECIS 2013: 21st European Conference on Information Systems (Utrecht, 2013)*.
- Aspara, J., Lamberg, J. A., Laukia, A. & Tikkanen, H. (2011). Strategic management of business model transformation: Lessons from Nokia. *Management Decision*, 49 (4), 622-647.
- Avgerou, C. (2000). IT and organizational change: An institutionalist perspective. *Information Technology & People*, 13 (4), 234-262.
- Bandara, W., Furtmueller, E., Gorbacheva, E., Miskon, S. & Beekhuyzen, J. (2015). Achieving rigor in literature reviews: Insights from qualitative data analysis and tool-support. *Communications of the Association for Information Systems*, 37, 154-204.
- Barley, S. R. & Tolbert, P. S. (1997). Institutionalization and structuration: Studying the links between action and institution. *Organization Studies*, 18 (1), 93-117.
- Benbasat, I., Goldstein, D. K. & Mead, M. (1987). The case research strategy in studies of information systems. *MIS Quarterly*, 11 (3), 369-386.
- Berends, H., Smits, A., Reymen, I. & Podoyntsyna, K. (2016). Learning while (re)configuring: Business model innovation processes in established firms. *Strategic Organization*, 14 (3), 181-219.
- Besson, P., & Rowe, F. (2012). Strategizing information systems-enabled organizational transformation: A transdisciplinary review and new directions. *Journal of Strategic Information Systems*, 21 (2), 103-124.
- Björkdahl, J. (2009). Technology cross-fertilization and the business model: The case of integrating ICTs in mechanical engineering products. *Research Policy*, 38 (9), 1468-1477.
- Blank, S. (2013). Why the lean start-up changes everything. *Harvard Business Review*, 91 (5), 63-72.

- Bohnsack, R., Pinkse, J. & Kolk, A. (2014). Business models for sustainable technologies: Exploring business model evolution in the case of electric vehicles. *Research Policy*, 43 (2), 284-300.
- Bouwman, H., Heikkilä, J., Heikkilä, M., Leopold, C. & Haaker, T. (2016). Achieving agility using business model stress testing. *Electronic Markets*, 28, 149-162.
- Brink, J. and Holmén, M. (2009). Capabilities and radical changes of the business models of new bioscience firms. *Creativity and Innovation Management*, 18 (2), 109-120.
- Bucherer, E., Eisert, U. & Gassmann, O. (2012). Towards systematic business model innovation: lessons from product innovation management. *Creativity and Innovation Management*, 21 (2), 183-198.
- Casadesus-Masanell, R. & Ricart, J. E. (2010). From strategy to business models and onto tactics. *Long Range Planning*, 43 (2-3), 195-215.
- Cavalcante, S., Kesting, P. & Ulhøi, J. (2011). Business model dynamics and innovation: (re)establishing the missing linkages. *Management Decision*, 49 (8), 1327-1342.
- Chatfield, A. & Bjorn-Andersen, N. (1997). The impact of IOS-enabled business change on business outcomes: transformation of the value chain of Japan Airlines. *Journal of Management Information Systems*, 14 (1), 13-40.
- Chatterjee, D., Grewal, R. & Sambamurthy, V. (2002). Shaping up for E-commerce: institutional enablers of the organizational assimilation of web technologies. *MIS Quarterly*, 26 (2), 65-89.
- Chesbrough, H. (2010). Business model innovation: opportunities and barriers. *Long Range Planning*, 43 (2-3), 354-363.
- Chesbrough, H. & Rosenbloom, R. (2002). The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. *Industrial and Corporate Change*, 11 (3), 529-555.
- Clohessy, T., Acton, T., Morgan, L. & Conboy, K. (2016). The times they are a-changing for ICT service provision: A cloud computing business model perspective. In *ECIS 2016: Proceedings of the 24th European Conference on Information Systems (Istanbul, 2016)*.
- Cosenz, F. & Noto, G. (2017). A dynamic business modelling approach to design and experiment new business venture strategies. *Long Range Planning*, 1-14.
- Cule, P. E. & Robey, D. (2004). A dual-motor, constructive process model of organizational transition. *Organization Studies*, 25(2), 229-260.
- Davidson, E. J. (1997). *Examining project history narratives: An analytic approach*. In *Information systems and qualitative research*. Boston, MA: Springer.
- De Reuver, M., Bouwman, H. & MacInnes, I. (2008). Business model dynamics: a case survey. *Journal of Theoretical and Applied Electronic Commerce Research*, 4 (1), 1-11.
- De Reuver, M., Bouwman, H. & MacInnes, I. (2009). Business models dynamics for start-ups and innovating e-businesses. *International Journal of Electronic Business*, 7 (3), 269-286.

- Demil, B. & Lecocq, X. (2010). Business model evolution: in search of dynamic consistency. *Long Range Planning*, 43 (2-3), 227-246.
- Doz, Y. L. & Kosonen, M. (2010). Embedding strategic agility: A leadership agenda for accelerating business model renewal. *Long Range Planning*, 43 (2-3), 370-382.
- Dunford, R., Palmer, I. & Benveniste, J. (2010). Business model replication for early and rapid internationalisation: The ING direct experience. *Long Range Planning*, 43 (5-6), 655-674.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, 14 (4), 532-550.
- Feller, J., Finnegan, P. & Nilsson, O. (2011). Open innovation and public administration: transformational typologies and business model impacts. *European Journal of Information Systems*, 20, 358-374.
- Foss, N. J. & Saebi, T. (2017). Fifteen years of research on business model innovation: How far have we come, and where should we go? *Journal of Management*, 43 (1), 200-227.
- Frankenberger, K., Weiblen, T., Csik, M. & Gassmann, O. (2013). The 4I-framework of business model innovation: a structured view on process phases and challenges. *International Journal of Product Development*, 18, 249-273.
- Gambardella, A. & McGahan, A. (2010). Business-model innovation: General purpose technologies and their implications for industry structure. *Long Range Planning*, 43, 262-271.
- George, G. & Bock, A. J. (2011). The business model in practice and its implications for entrepreneurship research. *Entrepreneurship Theory and Practice*, 35 (1), 83-111.
- Gersick, C. J. (1991). Revolutionary change theories: A multilevel exploration of the punctuated equilibrium paradigm. *Academy of Management Review*, 16 (1), 10-36.
- Ghezzi, A., Cavallaro, A., Rangone, A. & Balocco, R. (2015). On business models, resources and exogenous (dis)continuous innovation: evidences from the mobile applications industry. *International Journal of Technology Management*, 68 (12), 21-48.
- Giesen, E., Riddleberger, E., Christner, R. & Bell, R. (2010). When and how to innovate your business model. *Strategy & Leadership*, 38 (4), 17-26.
- Giessmann, A. & Stanoevska-Slabeva, K. (2012). Business models of Platform as a Service (PaaS) providers: Current state and future directions. *Journal of Information Technology Theory and Application (JITTA)*, 13 (4), 31-55.
- Hannan, M. T. & Freeman, J. (1984). Structural inertia and organizational change. *American Sociological Review*, 49 (2), 149-164.
- Hardgrave, B. & Walstrom, K. (1997). Forums for Management Information Systems Scholars. *Communications of the ACM*, 38 (3), 93-102.
- Hedman, J. & Kalling, T. (2003). The business model concept: Theoretical underpinnings and empirical illustrations. *European Journal of Information Systems*, 12 (1), 49-59.

- Iansiti, M. & Levien, R. (2004). Strategy as ecology. *Harvard Business Review*, 82 (3), 68-81.
- Iveroth, E. (2010). Inside Ericsson: A framework for the practice of leading global IT-enabled change. *California Management Review*, 53, 136-153.
- Iyer, B. & Henderson, J. (2010). Preparing for the future: Understanding the seven capabilities of cloud computing. *MIS Quarterly Executive*, 9 (2), 117-131.
- Jetter, M., Satzger, G. & Neus, A. (2009). Technological innovation and its impact on business model, organization and corporate culture – IBM's transformation into a globally integrated, service oriented enterprise. *Business & Information Systems Engineering*, 1 (1), 37-45.
- Johnson, M. W., Christensen, C. M. & Kagermann, H. (2008). Reinventing your business model. *Harvard Business Review*, 86 (12), 57-68.
- Karjalainen, M., Siponen, M. & Sarker, S. (2020). Toward a stage theory of the development of employees' information security behavior. *Computers & Security*, 93, 101782.
- Kamoun, F. (2008). Rethinking the business model with RFID. *Communications of the Association for Information Systems*, 22 (1), 35.
- Kettinger, W. J., Teng, J. T. & Guha, S. (1997). Business process change: a study of methodologies, techniques, and tools. *MIS Quarterly*, 21 (1), 55-80.
- Kindström, D. (2010). Towards a service-based business model – Key aspects for future competitive advantage. *European Management Journal*, 28, 479-490.
- Klaus, T. & Blanton, J. E. (2010). User resistance determinants and the psychological contract in enterprise system implementations. *European Journal of Information Systems*, 19 (6), 625-636.
- Klein, H. K. & Myers, M. D. (1999). A set of principles for conducting and evaluating interpretive field studies in information systems. *MIS Quarterly*, 23 (1), 67-93.
- Kranz, J. J., Hanelt, A. & Kolbe, L. M. (2016). Understanding the influence of absorptive capacity and ambidexterity on the process of business model change – The case of on-premise and cloud-computing software. *Information Systems Journal*, 26 (5), 477-517.
- Kuk, G. & Janssen, M. (2013). Assembling infrastructures and business models for service design and innovation. *Information Systems Journal*, 23, 445-469.
- Lambert, S. C. & Davidson, R. A. (2013). Applications of the business model in studies of enterprise success, innovation and classification: An analysis of empirical research from 1996 to 2010. *European Management Journal*, 31 (6), 668- 681.
- Lehoux, P., Daudelin, G., Williams-Jones, B., Denis, J-L. & Longo, C. (2014). How do business model and health technology design influence each other? Insights from a longitudinal case study of three academic spin-offs. *Research Policy*, 43, 1025-1038.

- Lin, L-M. & Hsia, T-L. (2011). Core capabilities for practitioners in achieving e-business innovation. *Computers in Human Behavior*, 27, 1884–1891.
- Lucas Jr, H. C. & Goh, J. M. (2009). Disruptive technology: How Kodak missed the digital photography revolution. *The Journal of Strategic Information Systems*, 18 (1), 46-55.
- Lyytinen, K., & Newman, M. (2008). Explaining information systems change: A punctuated sociotechnical change model. *European Journal of Information Systems*, 17 (6), 589-613.
- Magretta, J. (2002). Why Business Models Matter. *Harvard Business Review*, 80 (5), 86–92.
- Manikas, K. & Hansen, K. M. (2013). Software ecosystems – A systematic literature review. *Journal of Systems and Software*, 86 (5), 1294-1306.
- Marston, S., Bandyopadhyay, S., Zhang, J. & Ghalsasi, A. (2011). Cloud computing - The business perspective. *Decision Support Systems*, 51, 176–189.
- Martins, L. L., Rindova, V. P. & Greenbaum, B. E. (2015). Unlocking the hidden value of concepts: a cognitive approach to business model innovation. *Strategic Entrepreneurship Journal*, 9 (1), 99-117.
- Massa, L., Tucci, C. & Afuah, A. (2017). A critical assessment of business model research. *Academy of Management Annals*, 11 (1), 73–104.
- McGrath, R. G. (2010). Business Models: A Discovery Driven Approach. *Long Range Planning*, 43, 247-261.
- Mehrizi, M. H. R. & Lashkarbolouki, M. (2016). Unlearning troubled business models: From realization to marginalization. *Long Range Planning*, 49 (3), 298-323.
- Miles, M.B. & Huberman, A.M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook*. California: Sage Publications.
- Mithas, S., Ramasubbu, N. & Sambamurthy, V. (2011). How information management capability influences firm performance. *MIS Quarterly*, 35 (1), 237–256.
- Morris, M., Schindehutte, M. & Allen, J. (2005) The entrepreneur's business model: Toward a unified perspective. *Journal of Business Research*, 58 (6), 726-735.
- Ojala, A. (2016). Business models and opportunity creation: How IT entrepreneurs create and develop business models under uncertainty. *Information Systems Journal*, 26 (5), 451-476.
- Okoli, C. & Schabram, K. (2010). A guide to conducting a systematic literature review of information systems research. *Sprouts Working Papers on Information Systems*, 10, 1–51.
- Orlikowski, W. (1996). Improvising organizational transformation over time: a situated change perspective. *Information Systems Research*, 7 (1), 63–92.
- Osterwalder, A. & Pigneur, Y. (2013). Designing business models and similar strategic objects: The contribution of IS. *Journal of the Association for Information Systems*, 14, 237-244.

- Osterwalder, A. & Pigneur, Y. (2010). *Business model generation: a handbook for visionaries, game changers, and challengers*. Hoboken, New Jersey: John Wiley & Sons, Inc.
- Osterwalder, A., Pigneur, Y. & Tucci, C.L. (2005). Clarifying business models: origins, present, and future of the concept. *Communications of the Association for Information Systems*, 16 (1), 140.
- Paré, G., Trudel, M. C., Jaana, M. & Kitsiou, S. (2015). Synthesizing information systems knowledge: A typology of literature reviews. *Information and Management*, 52, 183-199.
- Pateli, A. & Giaglis, G. (2004). A research framework for analysing eBusiness models. *European Journal of Information Systems*, 13, 302– 314.
- Pateli, A. G. & Giaglis, G. M. (2005). Technology innovation-induced business model change: a contingency approach. *Journal of Organizational Change Management*, 18 (2), 167-183.
- Pauwels, K. & Weiss, A. (2008). Moving from free to fee: How online firms market to change their business model successfully. *Journal of Marketing*, 72 (3), 14-31.
- Peppers, K. & Ya, T. (2003). Identifying and evaluating the universe of outlets for information systems research: Ranking the journals. *The Journal of Information Technology Theory and Application (JITTA)*, 5 (1), 6.
- Pettigrew, A. (1987). Context and action in the transformation of the firm. *Journal of Management Studies*, 24 (6), 649–670.
- Rai, A. & Tang, X. (2013). Research commentary – Information technology-enabled business models: A conceptual framework and a coevolution perspective for future research. *Information Systems Research*, 25 (1), 1-14.
- Remane, G., Hanelt, A., Nickerson, R. C. & Kolbe, L. M. (2017). Discovering digital business models in traditional industries. *Journal of Business Strategy*, 38 (2), 41-51.
- Ries, E. (2011). *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. New York: Crown Business.
- Rowe, F. (2014). What literature review is not: diversity, boundaries and recommendations. *European Journal of Information Systems*, 23 (3), 241–255.
- Schneider, S. & Spieth, P. (2013). Business model innovation: Towards an integrated future research agenda. *International Journal of Innovation Management*, 17 (1), 1340001.
- Siggelkow, N. (2002). Evolution toward Fit. *Administrative Science Quarterly*, 47 (1), 125-159.
- Sitoh, M. K., Pan, S. L., Zheng, X. & Chen, H. (2013). Information system strategy for opportunity discovery and exploitation: Insights from business model transformation. In *ICIS 2013: Proceedings of the 34th International Conference on Information Systems (Milan, 2013)*.
- Smith, W. K., Binns, A. & Tushman, M. L. (2010). Complex business models: Managing strategic paradoxes simultaneously. *Long Range Planning*, 43, 448-461.

- Sosna, M., Trevinyo-Rodríguez, R. N. & Velamuri, S. R. (2010). Business model innovation through trial-and-error learning: The Naturhouse case. *Long Range Planning*, 43(2-3), 383-407.
- Spiegel, O., Abbassi, P., Zylka, M. P., Schlagwein, D., Fischbach, K. & Schoder, D. (2016). Business model development, founders' social capital and the success of early stage internet start-ups: a mixed-method study. *Information Systems Journal*, 26(5), 421-449.
- Spieth, P., Schneckenberg, D. & Ricart, J. E. (2014). Business model innovation: State of the art and future challenges for the field. *R & D Management*, 44, 237-247.
- Svejenova, S., Planellas, M. & Vives, L. (2010). An individual business model in the making: A chef's quest for creative freedom. *Long Range Planning*, 43, 408-430.
- Tankhiwale, S. (2009). Exploring the interrelationship between Telco business model innovation and the change in business process architecture. *Journal of Telecommunications Management*, 2 (2), 126-137.
- Tapscott, D., Lowy, A. & Ticoll, D. (2000). *Digital capital: Harnessing the power of business webs*. Cambridge, MA: Harvard Business School Press.
- Teece, D. J. (2010). Business models, business strategy and innovation. *Long Range Planning*, 43(23), 172-194.
- Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning*, 51(1), 40-49.
- Tsohou, A., Siponen, M. & Newman, M. (2019). How does information technology-based service degradation influence consumers' use of services? An information technology-based service degradation decision theory. *Journal of Information Technology*, 35 (1), 2-24.
- Van Alstyne, M., Parker, G. & Choudary, S.P. (09.03.2018). 6 Reasons Platforms Fail. Retrieved from <https://hbr.org/2016/03/6-reasons-platforms-fail>.
- Van de Ven, A. H. & Poole, M. S. (1995). Explaining development and change in organizations. *Academy of Management Review*, 20 (3), 510-540.
- Veit, D., Clemons, E., Benlian, A., Buxmann, P., Hess, T., Kundisch, D., Leimeister, J. M., Loos, P., & Spann, M. (2014). Business models - An information systems research agenda. *Business & Information Systems Engineering*, 6 (1), 45-53.
- Velu, C. (2017). A systems perspective on business model evolution: The case of an agricultural information service provider in India. *Long Range Planning*, 50 (5), 603-620.
- Vlaar, P., De Vries, P. & Willenborg, M. (2005). Why incumbents struggle to extract value from new strategic options: Case of the European airline industry. *European Management Journal*, 23 (2), 154-169.
- Voelpel, S. C., Leibold, M. & Tekie, E. B. (2004). The wheel of business model reinvention: How to reshape your business model to leapfrog competitors. *Journal of Change Management*, 4 (3), 259-276.

- Voelpel, S., Leibold, M., Tekie, E. & Von Krogh, G. (2005). Escaping the red queen effect in competitive strategy: Sense-testing business models. *European Management Journal*, 23 (1), 37-49.
- Walsham, G. (1995). Interpretive case studies in IS research: Nature and method. *European Journal of Information Systems*, 4 (2), 74-81.
- Wang, D., Guo, H. & Liu, Lu. (2017). One goal, two paths: How managerial ties impact business model innovation in a transition economy. *Journal of Organizational Change Management*, 30 (5), 779-796.
- Webster, J. & Watson, R. T. (2002). Analyzing the past to prepare for the future: Writing a literature review. *MIS Quarterly*, 26 (2), xiii-xxiii.
- Willcocks, L. & Margetts, H. (1994). Risk assessment and information systems. *European Journal of Information Systems*, (3) 2, 127-138.
- Williamson, P. J. (2010). Cost Innovation: Preparing for a 'value-for-money' revolution. *Long Range Planning*, 43, 343-353.
- Wirtz, B. W., Schilke, O. & Ullrich, S. (2010). Strategic development of business models. *Long Range Planning*, 43, 272-290.
- Wirtz, B. W., Pistoia, A., Ullrich, S. & Göttel, V. (2016). Business models: Origin, development and future research perspectives. *Long Range Planning*, 49 (1), 36-54.
- Wrigley, C. & Straker, K. (2016). Designing innovative business models with a framework that promotes experimentation. *Strategy & Leadership*, 44 (1), 11-19.
- Xiao, L. & Greer, D. (2007). Towards agent-oriented model-driven architecture. *European Journal of Information Systems*, 16 (4), 390-406.
- Yunus, M., Moingeon, B. & Lehmann-Ortega, L. (2010). Building social business models: Lessons from the Grameen experience. *Long Range Planning*, 43 (2-3), 308-325.
- Zolnowski, A., Christiansen, T. & Gudat, J. (2016). Business model transformation patterns of data-driven innovations. In *ECIS 2016: Proceedings of the 24th European Conference on Information Systems (Istanbul, 2016)*.
- Zott, C. & Amit, R. (2007). Business model design and the performance of entrepreneurial firms. *Organization Science*, 18 (2), 181-199.
- Zott, C. & Amit, R. (2010). Business model design: An activity system perspective. *Long Range Planning*, 43 (2), 216-226.
- Zott, C., Amit, R. & Massa, L. (2011). The business model: Recent developments and future research. *Journal of Management*, 37, 1019-1042.

APPENDIX A – LIST OF JOURNALS

Academy of Management Executive
Academy of Management Journal
Academy of Management Review
ACM Computing Surveys
ACM SIGecom Exchanges
ACM Transactions on Database Systems
ACM Transactions on Information and System Security
ACM Transactions on Information Systems
Administrative Science Quarterly
American Economic Review
American Journal of Distance Education
Annals of Cases on Information Technology
Annals of Cases on Information Technology
Applied Artificial Intelligence
Artificial Intelligence
Australasian Journal of Information Systems
Automated Software Engineering
Behavior and Information Technology
Business and Information Systems Engineering
Business Process Management
California Management Review Interactions
Communication Research Interfaces
Communications of the ACM
Communications of the Assoc. for Information Systems International
Communications of the International Information Mgt.
Complexity
Computer
Computer Supported Cooperative Work
Computers and Industrial Engineering International
Computers and Operations Research International
Computers and Security International
Computers in Human Behavior International
Computers in Industry
Control and Cybernetics
Data and Knowledge Engineering
Datamation
Decision Sciences
Decision Support Systems
Distance Education
Electronic Commerce Research and Application
Electronic Commerce Research Journal
Electronic Journal of IS in Developing Countries
Electronic Markets
Empirical Software Engineering
Ethics and Information Technology
European Journal of Information Systems
European Journal of Operational Research
European Management Journal-+
Expert Systems

Expert Systems with Applications
Fortune
Government Information Quarterly
Group Decision and Negotiation
Harvard Business Review
Human Computer Interaction
Human Factors
Human Relations
Human Systems Management
IEEE Intelligent Systems
IEEE Multimedia
IEEE Software
IEEE Transactions on Engineering Management
IEEE Transactions on Knowledge and Data Engineering
IEEE Transactions on Professional Communication
IEEE Transactions on Software Engineering
Industrial Management and Data Systems
Informatica
Information and Organization
Information and Organization
Information and Software Technology
Information Management and Computer Security
Information Research
Information Resources Management Journal
Information Systems
Information Systems and e-Business Management
Information Systems Frontiers
Information Systems Journal
Information Systems Management
Information Systems Research
Information Technology and Management
Information Technology and People
Information Technology for Development
Information, Communication and Society
Informing Science
INFORMS Journal on Computing
Intelligent Data Analysis
International Journal of Accounting Information Systems
International Journal of Auditing
International Journal of Computer Vision
International Journal of Cooperative Information Systems
International Journal of Electronic Business
International Journal of Information Management
International Journal of Information Technology and Mgt.
International Journal of Innovation and Learning
International Journal of IT Standards and Standardization R.
International Journal of Mobile Communications
International Journal of Operations and Production Mgt.
International Journal of Production Economics
International Journal of Services, Technology and Mgt.
International Journal of SW Engineering and Knowledge
International Journal of Technology Management

International Transactions in Operational Research
Internet Research
JMM International Journal on Media Management
Journal Economic Dynamics and Control
Journal Interacting with Computers
Journal of Business Strategy
Journal of Advertising
Journal of Business Logistics
Journal of Computer Information Systems
Journal of Computer Mediated Communication
Journal of Consumer Research
Journal of Creative Behavior
Journal of Database Management
Journal of Decision Systems
Journal of Electronic Commerce
Journal of Electronic Commerce in Organizations
Journal of Electronic Commerce Research
Journal of End User Computing
Journal of Global Information Management
Journal of Global Information Technology Management
Journal of Healthcare Technology and Mgt.
Journal of Human Computer Studies
Journal of Human-Computer Interaction
Journal of Information Management
Journal of Information Science
Journal of Information Systems
Journal of Information Systems Management
Journal of Information Technology
Journal of Information Technology Education
Journal of Information Technology Theory and Application
Journal of Interactive Marketing
Journal of International Business Studies
Journal of Internet Commerce
Journal of IT Cases and Applications
Journal of Knowledge Management
Journal of Management
Journal of Management Information Systems
Journal of Management Studies
Journal of Managerial Issues
Journal of Managerial Issues
Journal of Marketing
Journal of Marketing Research
Journal of Medical Internet Research
Journal of Network and Computer Applications
Journal of Operation Research
Journal of Operations Management
Journal of Organizational Behavior
Journal of Organizational Change Management
Journal of Organizational Computing and EC
Journal of Political Economy
Journal of Relationship Marketing
Journal of Service Management

Journal of Service Research
Journal of Strategic Information Systems
Journal of Supply Chain Management
Journal of Systems and Information Technology
Journal of Systems and Software
Journal of the ACM
Journal of the American Society for Inf. Science and Tech.
Journal of the Association of Information Systems
Journal of the Operational Research Society
Journal of Universal Computer Science
Journal of World Business
Knowledge and Information Systems
Knowledge and Process Management
Knowledge Based Systems
Long Range Planning
Management Learning
Management Science
Marketing Science
MIS Quarterly
MIS Quarterly Executive
MIT Sloan Management Review
OMEGA
Operations Research
Organization
Organization Science
Organization Studies
Organizational Behavior and Human Decision
Organizational Dynamics
Rand Journal of Economics
Requirements Engineering
Research in Consumer Behavior
Research Policy
Scandinavian Journal of Information Systems
Scandinavian Journal of Management
SIGMOD Record
Simulation
Small Group Research
Software and Systems Modeling
Software Quality Journal
Strategic Management Journal
Supply Chain Management
Systems Research and Behavioral Science
Telematics and Informatics
The Information Society
VLDB Journal

APPENDIX B – CODING RESULTS OF THE IDENTIFIED PAPERS

Organization transformation	BM transformation perspectives	Code
Process	Horizontal transformation process stages	<p>Sensing the need for BM change (Andries et al., 2013; Aspara et al., 2011; Aspara et al., 2013; Bucherer et al., 2012; Cule and Robey, 2004; Frankenberger et al., 2013; Kranz et al., 2016; Martins et al., 2015; Mehrizi and Lashkarbolouki, 2016; Ojala, 2016; Pateli and Giaglis, 2005; Remane et al., 2017; Sosna et al., 2010; Teece, 2017; Voelpel et al., 2004; Voelpel et al., 2005)</p> <p>Designing the BM transformations (Andries et al., 2013; Berends et al., 2016; Bouwman et al., 2016; Bucherer et al., 2012; Cavalcante et al., 2011; Chesbrough et al., 2010; Cosenz and Noto, 2017; Cule and Robey, 2004; De Reuver et al., 2008; De Reuver et al., 2009; Johnson et al., 2008; Kamoun, 2008; Kranz et al., 2016; Martins et al., 2015; McGrath, 2010; Mehrizi and Lashkarbolouki, 2016; Morris et al., 2005; Ojala, 2016; Pateli and Giaglis, 2005; Remane et al., 2017; Sosna et al., 2010; Teece, 2017; Voelpel et al., 2004; Voelpel et al., 2005)</p> <p>Searching for cognitive and economic BM (Berends et al., 2016; Frankenberger et al., 2013; Andries et al., 2013; Aspara et al., 2011; Aspara et al., 2013; Bucherer et al., 2012; Cavalcante et al., 2011; Chesbrough et al., 2010; Cule and Robey, 2004; Dunford et al., 2010; Kindström, 2010; Kranz et al., 2016; Mehrizi and Lashkarbolouki, 2016; Ojala, 2016; Sosna et al., 2010; Yunus et al., 2010)</p> <p>Implementing the BM change (Bucherer et al., 2012; Cule and Robey, 2004; Sosna et al., 2010; Teece, 2017)</p> <p>Stagnant stage for minor adaptations (Moyon and Lecocq, 2010; Sosna et al., 2010)</p>
	Vertical layers: cognitive and economic	<p>Cognitive BM (Aspara et al., 2011; Aspara et al., 2013; Berends et al., 2016; Bouwman et al., 2016; Cavalcante et al., 2011; Chesbrough et al., 2010; Cule and Robey, 2004; De Reuver et al., 2008; De Reuver et al., 2009; Frankenberger et al., 2013; Kindström, 2010; Kranz et al., 2016; Martins et al., 2015; Morris et al., 2005; Remane et al., 2017; Sosna et al., 2010; Teece, 2017; Voelpel et al., 2004; Voelpel et al., 2005)</p> <p>Economic BM (Andries et al., 2013; Aspara et al., 2011; Aspara et al., 2013; Berends et al., 2016; Bucherer et al., 2012; Cavalcante et al., 2011; Cule and Robey, 2004; Dunford et al., 2010; Johnson et al., 2008; McGrath, 2010; Mehrizi and Lashkarbolouki,</p>

		2016; Moyon and Lecocq, 2010; Ojala, 2016; Pateli and Giaglis, 2005; Sosna et al., 2010; Yunus et al., 2010)
Content	<p>Alignment of BM with the environment</p> <p>Alignment of BM elements</p> <p>Performance through fit</p>	<p>External fit (Basile and Faraci, 2015; Berends et al., 2016; Bouwman et al., 2016; Casadesus-Masanell and Ricart, 2010; Demil and Lecocq, 2010; Desyllas and Sako, 2013; Kamoun, 2008; Kuk and Janssen, 2013; Morris et al., 2005; Sitoh et al., 2013; Teece, 2017)</p> <p>Internal alignment (Berends et al., 2016; Björkdahl, 2009; Bouwman et al., 2016; Frankenberger et al., 2013; Kuk and Janssen, 2013; Lehoux et al., 2014; Voelpel et al., 2004)</p> <p>Performance associated with fit/alignment (Johnson et al., 2008; Rai and Tang, 2014)</p>
Context	Exogenous opportunities and uncertainties	<p>Changes in technologies available (Al Humaidan and Sabatier, 2017; Aspara et al., 2011; Björkdahl, 2009; Bohnsack et al., 2014; Bouwman et al., 2016; Bucherer et al., 2012; Casadesus-Masanell and Ricart, 2010; Cavalcante et al., 2011; Chesbrough et al., 2010; De Reuver et al., 2008; De Reuver et al., 2009; Desyllas and Sako, 2013; Frankenberger et al., 2013; Johnson et al., 2008; Kamoun, 2008; Lucas and Goh, 2009; Martins et al., 2015; Moyon and Lecocq, 2010; Ojala, 2016; Pateli and Giaglis, 2005; Saebi et al., 2017; Sosna et al., 2010; Teece, 2017; Velu, 2017; Vlaar et al., 2005; Voelpel et al., 2004; Voelpel et al., 2005; Wang et al., 2017; Williamson, 2010; Wirtz et al., 2010; Zolnowski et al., 2016)</p> <p>Competitive environment and environmental changes (Aspara et al., 2011; Aspara et al., 2013; Basile and Faraci, 2015; Bouwman et al., 2016; Bucherer et al., 2012; Cao, 2014; Casadesus-Masanell and Ricart, 2010; Cavalcante et al., 2011; Cule and Robey, 2004; De Reuver et al., 2008; De Reuver et al., 2009; Demil and Lecocq, 2010; Di Valentin et al., 2013; Frankenberger et al., 2013; Johnson et al., 2008; Kindström, 2010; Kuk and Janssen, 2013; Lehoux et al., 2014; Martins et al., 2015; McGrath, 2010; Moyon and Lecocq, 2010; Saebi et al., 2017; Sosna et al., 2010; Teece, 2017; Velu, 2017; Vlaar et al., 2005; Voelpel et al., 2004; Voelpel et al., 2005; Wang et al.,</p>

	2017; Williamson, 2010; Wirtz et al., 2010; Zolnowski et al., 2016)
Endogenous drivers and inhibitors	<p>Resources and capabilities, or lack thereof (Achtenhagen et al., 2013; Aspara et al., 2011; Aspara et al., 2013 Björkdahl, 2009; Brink and Holmén, 2009; Chesbrough et al., 2010; Desyllas and Sako, 2013; Doz and Kosonen, 2010; Frankenberger et al., 2013; Kamoun, 2008; Kindström, 2010; Kranz et al., 2016; Lehoux et al., 2014; Lin and Hsia, 2011; Lucas and Goh, 2009; McGrath, 2010; Rai and Tang, 2014; Sitoh et al., 2013; Smith et al., 2010; Svejenova et al., 2010; Teece, 2017; Velu, 2017; Voelpel et al., 2004; Voelpel et al., 2005; Wang et al., 2017; Williamson, 2010; Wirtz et al., 2010; Yunus et al., 2010)</p> <p>Management model, culture or other organizational aspect driving or inhibiting change (Andries et al., 2013; Achtenhagen et al., 2013; Aspara et al., 2013; Basile and Faraci, 2015; Berends et al., 2016; Björkdahl, 2009; Bohnsack et al., 2014; Bucherer et al., 2012; Cavalcante et al., 2011; Chesbrough et al., 2010; Cule and Robey, 2004; Desyllas and Sako, 2013; Doz and Kosonen, 2010; Frankenberger et al., 2013; Johnson et al., 2008; Lucas and Goh, 2009; Mehrizi and Lashkarbolouki, 2016; Moyon and Lecocq, 2010; Smith et al., 2010; Sosna et al., 2010; Svejenova et al., 2010; Velu, 2017; Vlaar et al., 2005; Voelpel et al., 2004; Voelpel et al., 2005; Wang et al., 2017; Yunus et al., 2010)</p> <p>Managerial skills and cognition, or lack thereof (Achtenhagen et al., 2013; Al Humaidan and Sabatier, 2017; Aspara et al., 2011; Aspara et al., 2013; Basile and Faraci, 2015; Bohnsack et al., 2014; Cavalcante et al., 2011; Chesbrough et al., 2010; Desyllas and Sako, 2013; Doz and Kosonen, 2010; Dunford et al., 2010; Kindström, 2010; Kranz et al., 2016; Lehoux et al., 2014; Lucas and Goh, 2009; Martins et al., 2015; McGrath, 2010; Mehrizi and Lashkarbolouki, 2016; Smith et al., 2010; Sosna et al., 2010; Svejenova et al., 2010; Teece, 2017; Velu, 2017; Vlaar et al., 2005; Voelpel et al., 2004; Voelpel et al., 2005; Wang et al., 2017; Williamson, 2010; Yunus et al., 2010)</p> <p>Individual propensities and willingness (Cavalcante et al., 2011; Desyllas and Sako, 2013; Frankenberger et al., 2013; Mehrizi and Lashkarbolouki, 2016)</p>

Note. BM = business model.

APPENDIX C - BASIC DETAILS OF INTERVIEWS

Company	Participant	Role	Abbreviation	Date	Type	Length
Alpha	A	Account Manager	AM	24.7.2018	Online	39min
Alpha	B	Business Manager	BM	24.7.2018	Online	41min
Alpha	C	Business Development Manager	BDM	18.7.2018	Meeting room	33min
Alpha	D	Business Unit Manager	BUM	25.7.2018	Meeting room	35min
Alpha	E	Former CEO	ex-CEO	31.7.2018	Online	38min
Alpha	F	CEO	CEO	31.7.2018	Meeting room	39min
Beta	A	Project Lead	PL	8.4.2020	Online	32min
Beta	B	CEO	CEO	16.4.2020	Online	31min
Beta	C	Service Director	SD	15.4.2020	Online	38min
Beta	D	Business Director	BD	9.4.2020	Online	35min
Beta	E	Project Specialist	PS	15.4.2020	Online	38min
Beta	F	Project Engineer	PE	9.4.2020	Online	30min