

**Business Model Innovation in New Ventures:
An Actor Engagement and Role Perspective**

Vom Fachbereich Wirtschaftswissenschaften
der Technischen Universität Kaiserslautern
zur Verleihung des akademischen Grades
Doctor rerum politicarum (Dr. rer. pol.)
genehmigte

DISSERTATION

vorgelegt von

M. Sc. Sophie Mentges

Tag der mündlichen Prüfung:	21.06.2022
Dekan	Prof. Dr. Jan Wenzelburger
Vorsitzender:	Prof. Dr. Jan Wenzelburger
Berichterstattende:	1. Prof. Dr. Stefan Roth 2. Prof. Dr. Gordon Müller-Seitz

D 386

(2022)

Table of Contents

Table of Contents	I
List of Figures.....	IV
List of Tables.....	V
List of Abbreviations.....	VII
1 Introduction	1
1.1 Motivation and Research Questions.....	1
1.2 Structure	5
2 Foundation on Business Models and Business Model Innovation.....	8
2.1 Business Model	8
2.1.1 Terminology	9
2.1.1.1 Definition of Business Model.....	10
2.1.1.2 Categorisation of Definitions	16
2.1.2 Descriptive Components	21
2.2 Business Model Innovation	30
2.2.1 Terminology	31
2.2.1.1 Idea, Invention, and Innovation.....	31
2.2.1.2 Definition of Business Model Innovation	31
2.2.1.3 Types of Business Model Innovation	38
2.2.2 Theoretical Background	45
2.2.2.1 Theory of Effectuation, Causation, and Bricolage	47
2.2.2.2 Methods of Learning and Experimentation.....	48
2.2.3 Structured Process Models	54
2.2.4 Empirical Insights on the Antecedents and Outcomes	62
3 Foundation on Engagement and Actor Roles	72
3.1 Engagement	72
3.1.1 Terminology	73
3.1.1.1 Definition of Customer Engagement.....	73
3.1.1.2 Definition of Actor Engagement	81
3.1.2 Theoretical Background	85

3.1.2.1	Service-dominant Logic and Value Co-creation	86
3.1.2.2	Resource-based View and Resource-exchange Theory.....	87
3.1.2.3	Social Networking Theory.....	90
3.1.3	Empirical Insights on the Antecedents and Outcomes	91
3.2	Actor Roles	97
3.2.1	Role Theory	97
3.2.2	Role Concepts in Innovation	104
4	Project I: Engagement and Experimentation in Business Model Design	111
4.1	Methodology.....	112
4.1.1	Qualitative Interviews.....	112
4.1.2	Abductive Reasoning.....	113
4.2	Qualitative-empirical Study.....	115
4.2.1	Preparation of the Interviews.....	115
4.2.2	Data Collection and Sample	118
4.2.3	Data Analysis.....	122
4.2.4	Results	125
4.2.4.1	Forms of Thought Experimentation	125
4.2.4.2	Roles of Actor Engagement Behaviour	131
4.2.5	Discussion of the Results.....	137
5	Project II: Actor Roles in Business Model Design.....	141
5.1	Methodology.....	142
5.1.1	Qualitative Interviews.....	142
5.1.2	Qualitative Content Analysis.....	143
5.2	Qualitative-empirical Study.....	145
5.2.1	Preparation of the Interviews.....	145
5.2.2	Data Collection and Sample	146
5.2.3	Data Analysis.....	147
5.2.4	Results	149
5.2.4.1	Specification of a Role Concept	150
5.2.4.2	Role Dynamics and Patterns.....	163
5.2.5	Discussion of the Results.....	174
6	Project III: Temporal Classification of Actor Roles in Business Model Design.....	178
6.1	Study I	178

6.1.1	Methodology.....	178
6.1.1.1	Case Studies.....	179
6.1.1.2	Process Analysis.....	181
6.1.2	Longitudinal Case Studies.....	183
6.1.2.1	Case Selection.....	183
6.1.2.2	Data Collection.....	185
6.1.2.3	Data Analysis.....	187
6.1.2.4	Results.....	192
6.1.2.4.1	Description of Case 1—Alpha.....	192
6.1.2.4.2	Description of Case 2—Beta.....	195
6.1.2.5	Discussion of the Results.....	197
6.2	Study II.....	199
6.2.1	Methodology.....	199
6.2.1.1	Quantitative Survey Methods.....	199
6.2.1.2	Data Analytical and Statistical Methods.....	201
6.2.2	Quantitative-Descriptive Study.....	203
6.2.2.1	Conception of the Questionnaire.....	203
6.2.2.2	Data Collection and Sample.....	207
6.2.2.3	Data Analysis.....	211
6.2.2.4	Results.....	213
6.2.2.4.1	Descriptive Analysis of the Sample.....	213
6.2.2.4.2	Descriptive Analysis of the Roles.....	215
6.2.2.4.3	Regression Analysis.....	218
6.2.2.4.4	Analysis of Variance.....	219
6.2.2.5	Discussion of the Results.....	223
6.3	Concluding Discussion.....	226
7	Conclusion.....	227
7.1	Summary of the Findings.....	227
7.2	Implications for Research and Practice.....	232
7.3	Limitations and Future Research.....	235
	Appendix.....	237
	References.....	257

List of Figures

Figure 1: Structure of the paper	7
Figure 2: Development of a converging business model view (based on Wirtz et al. (2010))	17
Figure 3: The Business Model Canvas (based on Osterwalder et al. (2010))	25
Figure 4: Components and partial models of the integrated business model (based on Wirtz et al. (2016, p. 44))	29
Figure 5: Generic business model innovation process (based on Wirtz and Thomas (2014, p. 45) and Wirtz and Daiser (2018, p. 51)).....	57
Figure 6: Overview of manifestations, antecedents, and outcomes of customer engagement (based on Ng et al. (2020, p. 244))	95
Figure 7: Data structure for forms of thought experimentation.....	126
Figure 8: Data structure for roles of engagement behaviour	132
Figure 9: Procedure of qualitative content analysis for inductive category formation (based on Mayring (2007, p. 75))	145
Figure 10: Timeline of Case 1—Alpha	189
Figure 11: Timeline of Case 2—Beta.....	190
Figure 12: Mean values of actor groups among the actor roles.....	216
Figure 13: Mean values of actor roles along the process stages.....	217
Figure 14: Mean values of importance and influence among the actor roles.....	218

List of Tables

Table 1: Selected definitions of a business model.....	15
Table 2: A cross-section of business model definitions (based on Lambert & Davidson (2013, p. 669))	19
Table 3: Comparison of existing BM elements (based on Schallmo (2014, p. 22))	27
Table 4: Selected definitions of business model innovation	37
Table 5: Business model innovation typology (based on Foss and Saebi (2017b, p. 217))	41
Table 6: Definitions and terms associated with business model innovation	44
Table 7: Selected business model innovation process phases (based on the generic process by Wirtz and Thomas (2014, p. 45) and Wirtz and Daiser (2018, p. 50)).....	61
Table 8: Selected definitions of customer engagement	75
Table 9: Revised fundamental propositions of customer engagement (based on Hollebeek (2019, p. 90))	78
Table 10: Selected definitions of engagement concepts.....	83
Table 11: Fundamental propositions of actor engagement (based on Brodie et al. (2019, p. 184))	84
Table 12: Selected definitions of role.....	104
Table 13: Interview guide for semi-structured interviews.....	117
Table 14: Overview of the key data pertaining to the interviews.....	121
Table 15: Transcription rules.....	122
Table 16: Illustrative evidence for forms of thought experimentation	127
Table 17: Illustrative evidence for roles of engagement behaviour	133
Table 18: Overview of actor roles in new ventures' business model design process	151
Table 19: Illustrative evidence of actor roles in the business model design process	153
Table 20: Prevalence of actor roles among the cases	164

Table 21: Prevalence of actor groups among the cases	167
Table 22: Percentage of actor groups among the actor roles.....	169
Table 23: Case study interviewees' profile	186
Table 24: Summary of the prevalences of the actor roles at each stage at Alpha	193
Table 25: Summary of the prevalences of the actor roles at each stage at Beta.....	195
Table 26: Actor roles and role descriptions.....	205
Table 27: Descriptive analysis of firm characteristics (N = 58).....	214
Table 28: Mean differences by size of the founding team	220
Table 29: Variance of analysis: Significance test of differences by the sizes of the founding team	221
Table 30: Mean differences by the spatial dimension	222
Table 31: Variance of analysis: Significance test of differences by spatial dimensions.....	222

List of Abbreviations

ANOVA	Analysis of variance
BM	Business model
BMI	Business model innovation
B2B	business-to-business
FP	Fundamental proposition
M	Mean
SD	Standard deviation

1 Introduction

1.1 Motivation and Research Questions

In the early start-up phase before entering a market, new ventures face the complex task of designing a business model (BM). In this phase, which is called the pre-seed phase, the BM not only serves to describe the functionality of a business and how it generates profits but also creates an identity for a new venture. Founders accomplish this task within the framework of an innovation process, the so-called business model innovation (BMI) process. It is important to note that not only the founders themselves but also many other actors play a central role in these BMI processes to support the new venture on its way to designing a viable BM (de Hoyos-Ruperto et al., 2013, p. 58). An example of such actors are accelerators, which are institutions that help start-ups to quickly develop their BM within a certain period through coaching.

The process of starting up a new venture, with a special focus on BMI, is being profoundly discussed in the entrepreneurship research and strategic management field (Brettel et al., 2012; Snihur & Zott, 2020). In this context, a new venture in its pre-seed phase is described as a young, innovative and not yet established firm in search of a sustainable, scalable BM (Schramm & Carstens, 2014, p. 11). The literature argues that new ventures seem to be confronted with BMI more often than established firms because founders often experience great difficulty in defining a viable BM at the first attempt, especially in an environment of high uncertainty (Andries & Debackere, 2007, p. 82; Teece, 2010, p. 187). It is widely acknowledged that BMI in a new venture is a very complex, multi-faceted, uncertain, and demanding task, captured in a dynamic decision-making process (Najmaei, 2016; Reymen et al., 2017; Sosna et al., 2010).

The process of BMI has been studied from different perspectives. Researchers in this discussion point to BMI as an evolutionary process (Dunford et al., 2010), or as an ongoing learning process (Gavetti & Levinthal, 2000; McGrath, 2010; Sosna et al., 2010), captured in theories and methods such as discovery-driven learning (McGrath, 2010; Teece, 2010), trial-and-error learning (Sosna et al., 2010), experimentation (Andries et al., 2013; Heikkilä et al., 2018), and effectuation (Chesbrough, 2010, Sarasvathy, 2001). The literature on experimentation

frequently highlights the fact that new ventures require rapid tests (e.g., prototypes) on the market to validate or reject their BM idea (Trimi & Berbegal-Mirabent, 2012, p. 452). A parallel stream that is still less commonly found at the centre of the discussion suggests that experimentation also includes cognitive schemas that guide founders in their decision making (Martins et al., 2015). This literature stream refers to terms such as thought experimentation (Felin & Zenger, 2009). In this conjuncture, actors evaluate alternatives based on their understanding of given circumstances and the probable consequences of certain behaviours, i.e., they think about alternatives to design a BM without actually testing them (Gavetti & Levinthal, 2000, pp. 114–115).

Thus, the set of feasible opportunities and viable BMs is often not predictable in advance (Alvarez & Barney, 2007). BM ideas have to be created and are revised at different stages of the BMI process (Dmitriev et al., 2014), which corresponds to what Chesbrough (2010) identifies as experimenting with alternative BMs. In addition, founders juggle numerous demands armed with a limited set of knowledge and resources (Bhide, 2000). Despite all efforts to the contrary, many start-ups fail in the pre-seed phase as they cannot manage these challenges.

Gassmann et al. (2017, p. 48) assert that systematic findings and deeper insights of how BMI happens along the lines of experiential learning and experimentation have been neglected and that researchers should adopt and build on the experiential learning perspective and strive to better understand the learning-by-doing processes of new ventures. This also brings scholars to the relevant, but seldom noticed field of research on experimentation as a cognitive schema (Felin et al., 2015; Gavetti & Levinthal, 2000). The few scholars that discussed the importance of thought experimentation in BMI did not elaborate on the manifestations of this phenomenon. Thus, the current state of the research on this topic has a gap that offers this paper the ability to clearly conceptualise experiential learning as a cognitive schema, focusing on thought experimentation.

In addition, the role of individuals in BMI, which is central to this paper's view, has only recently been recognised by scholars (Amit & Zott, 2015; Snihur & Zott, 2020). Because designing a new BM is such a complex task, it goes well beyond the motivation of only one individual, or as Trimi and Berbegal-Mirabent (2012, p. 453) put it: "It is an adventure that depends on the transactional links with external stakeholders". In this regard, researchers have

begun to study the process of BMI from different actors' perspectives. On the one hand, studies focus on entrepreneurs and their beliefs, planning, and decision-making (Cavalcante et al., 2011). On the other hand, studies suggest that the engagement of actors other than the entrepreneurs in BMI is beneficial, including customers, business partners, investors, regulators, relatives, or friends (Snihur et al., 2017). Hence, BMI can be regarded as both having influence and being influenced by internal actors of a firm (i.e., the founders), and also by external actors to the firm (Mason & Spring, 2011). In general, these external actors provide resources and knowledge, such as expert opinions and counselling, shared experiences, network connections, money and facilities, and support and motivation (Dimov, 2011; Hallen & Eisenhardt, 2012; Manning et al., 1989). This support helps entrepreneurs to rethink, reframe, and transform their initial BM over time, which may lead to new ways to create value (Bocken & Snihur, 2020, p. 6). It thus stands to reason that in addition to understanding how new ventures design their BM, it is also important to study how different actors are involved in this process.

Literature further emphasizes that also in relation to the specific topic of thought experimentation different actors (e.g., family, research institutions, investors) are involved, interact, and reflect on a new venture's ability to design a BM (Mansoori & Lackéus, 2019). Snihur et al. (2017, pp. 11–12) recommend the combination of this entrepreneurial learning perspective with an actor engagement view as a promising direction for future research. The influence of external actors may be particularly salient as they can influence the founders' mental schemas through their behaviours and interactions, provide access to resources, and help with decision-making. However, scholars have not yet clarified the behavioural patterns of engagement, and recent papers do not differentiate between mandatory and voluntary behaviours. Hence, the motives that drive actors to behave the way they do and to integrate the resources they provide to a new venture are not distinguished. There is still much to explore in terms of individuals' behaviours, both from the perspective of the founder(s) and external actors.

Furthermore, it stands to reason, that entrepreneurs and external actors each play a certain role in BMI. The innovation literature has shown substantial interest in a diverse range of actor roles, starting with the innovator roles by Witte (1973), followed by several studies that deepened this analysis in multiple contexts, such as value co-creation, innovation labs, or knowledge management (Agrawal & Rahman, 2015; Hacker et al., 2017; Nyström et al., 2014; Story et al.,

2011). Accordingly, extant research elaborates on the roles of actors in innovation processes in general, though it does not specifically address roles in the context of BMI. Yet, these roles might differ in their position and task. Certain behavioural patterns and types of resource contributions may be characteristic for a group of actors, leading to the emergence of distinct actor roles. It is also unclear if roles might differ in different stages of the pre-seed phase. Notably, an actor might be active in multiple stages of the BMI process, and each stage may contain several roles. This leads to the question regarding which actors play which essential roles in a new venture's BMI process at which times.

Accordingly, the leading research questions proposed are:

1. *How does thought experimentation manifest in the pre-seed phase of BMI in a new venture?*
2. *How does BMI in a new venture depend on actor engagement behaviours and how do these behaviours support the appearance of thought experimentation in BMI?*
3. *Which roles do actors play in the pre-seed phase of BMI in a new venture, how can they be characterised, and who performs these roles?*
4. *In what stages of the pre-seed phase do the actors play which roles?*

This paper is based on a qualitative-empirical study that uses in-depth interviews and thereby adopts a founder's perspective. The objective is to introduce BMI, relating methods of experimentation, and its processual perspective in particular. First, the purpose is to concretise manifestations of thought experimentation, thereby striving to better understand experimentation as a cognitive schema. Furthermore, this paper focuses on actor engagement behaviours and how these might influence the manifestations of thought experimentation. Second, the current research on roles in innovation contexts is to be extended, to provide empirical insights into actor roles in BMI. This paper uses a role concept to illustrate how actors are involved in designing a new BM, and also characterises their activities and tasks. Third, based on case study research with two university spin-outs, including interviews with the founders and actors external to the two spin-outs, this paper aims to explore in which stages of the pre-seed phase which actors play which roles. The case studies are complemented by a quantitative-descriptive study focusing on the entrepreneur's perspective, which adds a temporal dimension to the role concept.

This paper contributes to the literature on BMI and actor engagement. To the best of the authors knowledge, this paper is the first to integrate thought experimentation with an actor engagement view. This paper's results extend previous conceptualisations of experimentation by illustrating the interplay of three different forms of it, namely purposeful interactions, incidental interactions, and theorising. Further contributions lie in the theoretical framing and empirical support of how actor engagement behaviours support the three forms of thought experimentation. More precisely, the first study's results reveal six roles of engagement behaviour, including teaching, supporting, mobilising, co-developing, sharing, and signalling. Doing so not only generates a unique conceptual advancement of the actor engagement literature but also provides important insights for researchers and entrepreneurs seeking to better deploy and gain access to resources and to use relationships.

Additionally, this paper borrows insights from role theory (Biddle, 1986) to study the appearance of particular actor roles, enacted by various actor groups, as a new venture's BM unfolds over time. In this context, Story et al. (2011, p. 954) explain that actors have different positions and tasks regarding each interaction in which they are engaged. One common approach to categorise these positions and tasks is to consider key actor roles. Thus, a role concept is established including 13 actor roles. These actor roles are divided into task-oriented and network-oriented roles. Building on this, a variety of role dynamics are unveiled which include the frequency with which roles become visible, the type of influence the roles have on a new venture, which roles are adopted by which actor groups, and a discussion on the four patterns of role multiplicity, ambidexterity, reciprocity, and temporality. Special attention is given to role temporality. The results reveal how actor roles are played at a certain point in time, thereby concretising them in relation to certain stages of the pre-seed phase. In so doing, this paper provides insight into a yet unexplored aspect of BMI.

1.2 Structure

The paper is divided into an introductory chapter, five substantive chapters, and a concluding chapter. The procedure in the different chapters is detailed in the following.

The introductory chapter is followed by the theoretical foundations on BM research and research on BMI in chapter 2. After clarifying the terminology and descriptive components of BMs in chapter 2.1, the current state of research on BMI is considered in chapter 2.2, whereby

the terminology of BMI is presented, followed by an overview of the theories and methods of learning and experimentation in BMI as well as input on structured process models. Afterwards, an overview is given of empirical evidence regarding the antecedents and outcomes of BMI.

The third chapter provides a detailed overview of research on engagement and role theory. Chapter 3.1 starts with the foundations of engagement research. The terminology of customer engagement is followed by an overview of actor engagement. The theoretical background of engagement is subsequently presented, and a brief insight is given into the service-dominant logic, the resource-based view, and the social networking theory. This is followed by empirical evidence on the antecedents and outcomes of engagement. Chapter 3.2 is devoted to the theoretical explanatory approaches to role theory and the existing role concepts from innovation research.

Chapter 4 examines actor engagement and experimentation in the context of BMI through a qualitative study with in-depth interviews. In chapter 4.1, the methodology is first described, and the theoretical foundations on qualitative interviews and the analytical method of abductive reasoning are outlined. The first part of chapter 4.2 is concerned with the structure of the interviews, their conduction, and the subsequent analysis of the interview material after which the results are presented and divided into forms of thought experimentation and roles of engagement behaviour. The chapter closes with a discussion of the results.

In chapter 5, a role concept in the context of BMI is established, based on the qualitative study presented in chapter 4. Similar to the structure of chapter 4, the methodology is first described in chapter 5.1, whereby the theoretical foundations of qualitative interviews are briefly outlined and the analytical method of qualitative content analysis is described. Chapter 5.2 then outlines the structure of the interviews, describes how they were conducted, and presents the analysis of the interview data, followed by the results, i.e., the final role concept and its associated dynamics. This chapter closes with a discussion of the results.

In chapter 6, the role concept, which was conceptualised in chapter 5, is analysed along a temporal framework comprising five process stages. In addition, the roles are assessed according to their importance and assigned to actor groups. Chapter 6 is divided into two studies. The first study is dedicated to a case study analysing two university spin-outs. Chapter 6.1.1 outlines the theoretical background of case study research and explains process analysis as an analysis tool. Chapter 6.1.2 explains the data selection, data collection, and analysis,

followed by the results of the two case studies and a discussion of the results. The second study in chapter 6.2 includes a quantitative-descriptive study in which the objective is achieved by means of a questionnaire. For this purpose, the theoretical background for the development of a quantitative questionnaire is presented in chapter 6.2.1, followed by explanations of the evaluation possibilities for a quantitative study. In chapter 6.2.2, the conception of the questionnaire, the data collection, and the analysis are presented. This is followed by the results of the study and a short discussion of the results. The chapter concludes with a joint discussion of the two studies in chapter 6.3.

Finally, chapter 7 provides a summary of the results of the empirical studies and describes the implications for future research and managerial practice. An overview of this paper's structure is presented in figure 1.

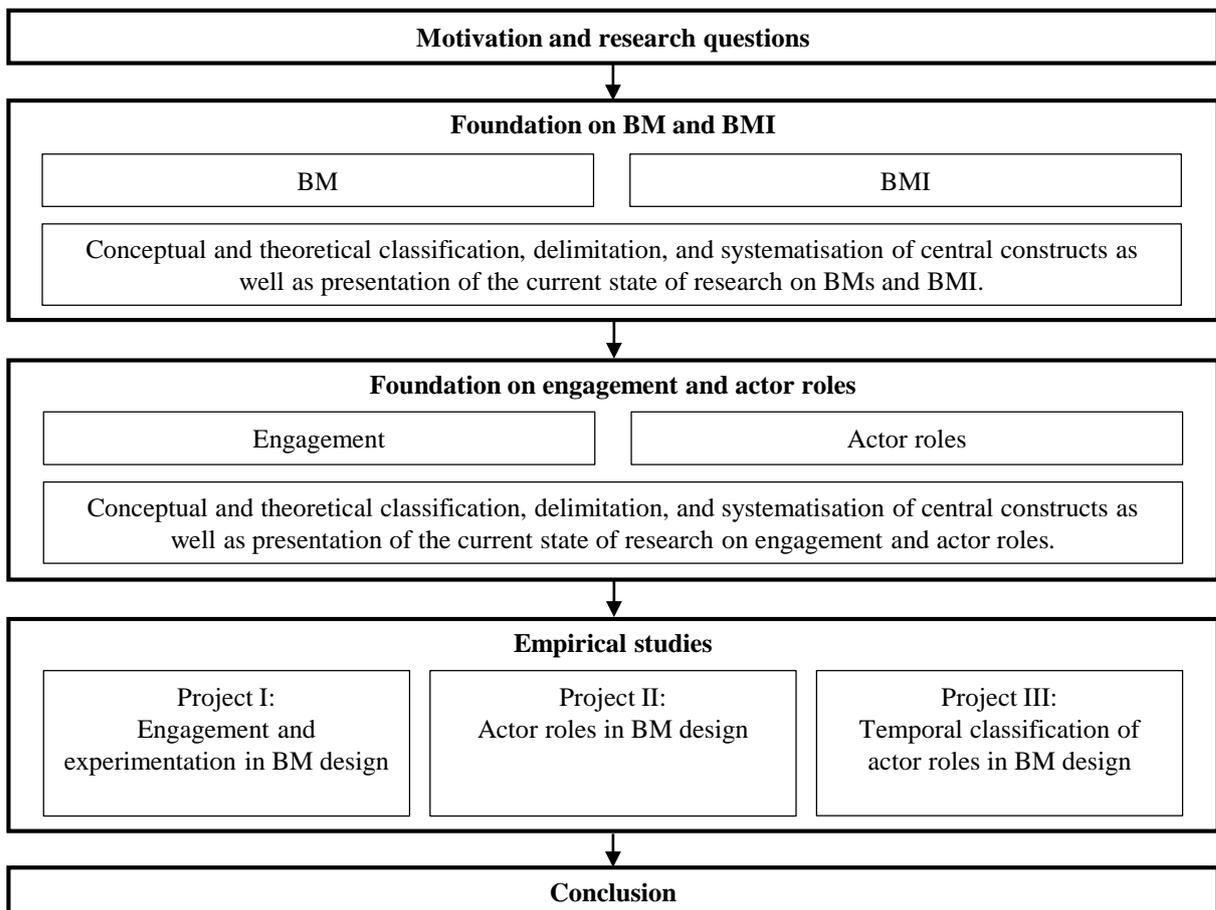


Figure 1: Structure of the paper

2 Foundation on Business Models and Business Model Innovation

To set the scene for the remainder of this work, it is essential to first understand the central concepts of BM and BMI. To date, there is no uniform definition but rather multiple diverging understandings of both terms and hence the objective in this chapter is to highlight existing definitions and approaches, discuss them, and create a synthesis in each case that serves as a terminological basis for this paper's studies.

In this manner, chapter 2 is divided into two main sections. In the first section (chapter 2.1), the foundations of BM research are presented. First, the BM concept is concretised, and the central definitional approaches are discussed. Subsequently, the current state of research on descriptive components of BMs is presented. The most current literature reviews and overviews are subsumed and compared to illustrate the collection of components in the literature.

In the second section (chapter 2.2), research on BMI is presented. First, the three terms idea, invention, and innovation are differentiated and afterwards, the terminology of BMI with its multiple definitional approaches is depicted. This is followed by an overview of the current state of research on types of and approaches to BMI that highlight its dimensionality and distinguish between BMI in start-ups and established firms. In a subsequent step, the theories and methods to develop a BM are considered. Afterwards, multiple structured process models of BMI are discussed. Finally, empirical insights relating to the antecedents and outcomes of BMI are provided.

2.1 Business Model

Since the beginning of the 2000s, interest in the BM as a concept has boomed. This has led to multiple analyses and studies on the BM and increased popularity of the concept among researchers and practitioners (Belussi et al., 2019, p. 1). The concept's multidisciplinary nature is illustrated by its extensive discussion among scholars focusing on electronic BMs (Amit & Zott, 2001), information systems (Osterwalder & Pigneur, 2004), technology and innovation management (Chesbrough & Rosenbloom, 2002), and strategy (Teece, 2010). BM literature is replete with conceptual and analytical research that provides definitions, components, and

classifications, all aiming to contribute to the knowledge of what a BM is (Lambert & Davidson, 2013, p. 668). The following two sub-chapters will provide an insight into the multitude of conceptualisations and approaches to the BM concept.

2.1.1 Terminology

In 1954, Peter Drucker insightfully declared that the purpose of a business is to create a customer (Drucker, 1954, p. 31). According to this, Drucker seems to have understood what is meant by the term BM. With his original idea of the logic of business, Drucker created a precursor to what is now understood under the concept of the BM in management theory (Bieger et al., 2011, p. 14) and many of the proposed approaches that describe BMs today merely reflect Drucker's original idea (Fjeldstad & Snow, 2018, p. 32). Forrester (1958), who was writing around the same time as Drucker, made a general theoretical statement linking the elements of the BM to organisational processes—which he called the company model—that represent the operations of a company and ways to improve company success. However, only since the advent of the internet in the 1990s has the BM emerged as a concept (Zott et al., 2011, p. 1022) and been studied and analysed in-depth, which led to its growing popularity among researchers and practitioners (Belussi et al., 2019).

Although researchers from the field of management and business sciences attribute the origin of the term BM to Drucker's publications from the 1950s (Casadesus-Masanell & Ricart, 2010; Johnson & Lafley, 2010; Markides, 2008), the origin of the BM as a concept in practice and science has not conclusively been clarified to date and hence authors from different disciplinary streams of the social sciences still attribute the concept to different sources (Bieger et al., 2011, p. 14). Researchers in the field of information systems see the source of the BM in the business modelling literature of the 1970s (Zollenkop, 2006). In this discipline, the term refers to “a simplified description of an aspect of the business for the purpose of illustrating and supporting communication” (Rentmeister & Klein, 2003, p. 18). Alongside this view, economists date the origin of the BM concept further back, estimating the first applications of the concept to be a generic description of business activities such as the medieval guild system or the factory system of the Industrial Revolution in the late 18th century (Baden-Fuller & Morgan, 2010, p. 159). Subsequently, different conceptions of the BM concept have developed since the 2000s.

2.1.1.1 Definition of Business Model

Most studies fail to clearly distinguish the BM from organizational constructs such as strategy (Osterwalder et al., 2005), as the terms BM and strategy are used in a multi-layered and overlapping way and their connection is unclear (Baden-Fuller & Morgan, 2010). Casadesus-Masanell and Ricart (2010) take a differentiated look at the relationship between strategy, BM, and tactics and attempt to clarify the differences between the concepts. The authors explain that the adoption of a BM is the result of a strategic choice, and thus the concepts operate at different levels. Belussi et al. (2019) reason that BMs can be described as reflections of a realised strategy. Similarly, Teece (2010, p. 180) states that a BM is more generic than a business strategy and, accordingly, that selecting a business strategy is a more granular exercise than designing a BM. While the BM is often largely recognisable to outside observers and can be copied to a certain extent (Teece, 2010), a company's strategy can only be observed in trivial competitive situations (Casadesus-Masanell & Ricart, 2010). Likewise, Magretta (2002, p. 88) describe the BM as a system that shows what a business does and how the pieces of a business fit together, while strategy also includes competition. In contrast, Seddon et al. (2004) regard the BM as an abstraction of a firm's strategy that may apply to many other firms.

Due to the large variety of concepts and lack of a uniform definition, the BM has often been studied without referring to an explicit definition (Belussi et al., 2019, p. 14). According to Zott et al. (2011, p. 1022), the BM has been described as a statement (Stewart & Zhao, 2000), a description (Weill & Vitale, 2001), a representation (Morris et al., 2005; Shafer et al., 2005), an architecture (Dubosson-Torbay et al., 2002; Timmers, 1998), a conceptual tool or model (George & Bock, 2010; Osterwalder, 2004; Osterwalder et al., 2005), a structural template (Amit & Zott, 2001), a method (Afuah & Tucci, 2001), a framework (Afuah, 2004), a pattern (Brousseau & Penard, 2007), or a set (Seelos & Mair, 2007). Moreover, the BM has become an increasingly important concept in a variety of fields such as technology and innovation management (Massa & Tucci, 2013; Tripsas & Gavetti, 2000), strategy (Casadesus-Masanell & Zhu, 2013; Teece, 2010), environmental sustainability (London & Hart, 2004; Schaltegger & Lüdeke-Freund, 2013), and social entrepreneurship (Seelos & Mair, 2007). These heterogeneous developments have produced a variety of definitions based on different contexts of use, objectives, degrees of concretisation, and levels of abstraction. The fact that (1) different research communities started to design and use the BM term at the same time, (2) scholars have studied the BM employing different subject-matter lenses and offered different, partially

conflicting, interpretations of what BM means and is used for, (3) the concept makes use of different elements and theories of different social science disciplines, and (4) the term became widespread with the emergence of the New Economy, resulted in the lack of a uniform understanding of what a BM actually is (Baden-Fuller & Morgan, 2010; Bieger et al., 2011; Massa et al., 2017; Teece, 2010).

To put an end to this confusion, several authors in academic research attempted to derive a precise definition, although their proposals also tend to vary significantly (Teece, 2010). Some authors take a narrow perspective and focus on technological or financial aspects, while others adopt a more generic perspective (Lindgren et al., 2010, p. 123). At a very general level, Massa et al. (2017) conclude that a BM is a description of an organisation and how that organisation functions in achieving its goals (e.g., profitability, growth). It also appears that many authors agree that a BM can intuitively be defined by the combination of the two terms *business* and *model*. Osterwalder et al. (2005) interpret the word model as “a simplified description and representation of a complex entity or process”, which implies simplified representations of reality. On the other hand, the authors interpret the word business as “the activity of providing goods and services involving financial, commercial, and industrial aspects”. However, beyond this intuitive interpretation, there is a lack of agreement among scholars. For this reason, a systematised overview of the existing approaches to defining the BM concept is provided in the following.

The initial paper on the BM concept by Amit and Zott (2001, p. 515) is deeply embedded in the field of electronic BMs. The authors describe the BM as the framework for a firm’s boundary-spanning transactions with other external stakeholders, including customers, suppliers, and complementors. According to Amit and Zott (2001, p. 511), the BM depicts three core elements, “the content, structure, and governance of transactions [that are] designed so as to create value through the exploitation of business opportunities”. Laudien and Daxböck (2016, p. 614) explain the three elements as follows:

- *Content*

Content refers to the selection of activities that are performed within the activity system, involving the exchange of products, services, and information between the network partners and the capabilities required to facilitate this exchange.

- *Governance*

Governance refers to issues of control and who is in charge of what activity, i.e., by whom the activities are performed.

- *Structure*

Structure refers to how activities are linked and the sequencing of the system's activities.

The initial BM conceptualisation by Amit and Zott (2001) can easily be transferred to other contexts (e.g., manufacturing firms) as it is subject to a cross-theoretical perspective that builds on well-established theories and approaches, such as transaction cost economics (Williamson, 1975), network theory (Katz & Shapiro, 1985), the resource-based view (Barney, 1991), or Schumpeterian innovation (Schumpeter, 1934). Alongside, three different approaches to BMs have emerged, including the *BM as a value logic*, *BM as an activity system*, and *a cognitive view on BMs*.

Magretta (2002, p. 87) refers to the *BM as a value logic* and describes BMs as “stories that explain how enterprises work”. The author states that “a good BM answers Peter Drucker’s age-old questions: Who is the customer? And what does the customer value? It also answers the fundamental questions every manager must ask: How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?” (Magretta, 2002, p. 87). With this definition, Magretta (2002) addresses three core elements of a BM, namely the value proposition, value creation and delivery, and value capture. Accordingly, a BM defines what a company offers and to whom, and how it earns money and other forms of value with it (Bocken & Short, 2016; Richardson, 2008). Thereby, the value proposition defines a portfolio of solutions for customers and how these are offered (Morris et al., 2005). The value creation explains how and by what means a firm creates value along the value chain by using intra- and interorganizational resources and capabilities (Achtenhagen et al., 2013). The value capture defines how a firm gains revenue to achieve profits and ensure sustainable performance, i.e., how the value proposition is converted into revenues (Johnson et al., 2008). The combination of the three value domains defines the design of a firm’s BM (Shafer et al., 2005). Similarly, in the words of Teece (2010, p. 179), “a BM articulates the logic, the data and other evidence that support a value proposition for the customer, and a viable structure of revenues and costs for the enterprise delivering that value”. Although the definitions by Magretta (2002) and Teece (2010) differ slightly, the adopted

perspective focuses on a company's logic and on company-centric activities related to "the design or architecture of the value creation, delivery and capture mechanisms employed" (Belussi et al., 2019, p. 4). Thus, the BM helps to describe, investigate, and design how a firm does business. Many authors (Belussi et al., 2019; Fiel, 2013; Foss & Saebi, 2017a) followed this approach by referring to the BM as a value logic or the value architecture of a BM. For example, Fiel (2013) and Belussi et al. (2019) both assert that "a BM describes the value logic of an organisation in terms of how it creates and captures customer value and can be concisely represented by an interrelated set of elements that address the customer, value proposition, organizational architecture, and economic dimensions" (Belussi et al., 2019; Fiel, 2013, p. 99).

Afuah (2004, p. 9) defines a BM as "the set of activities a firm performs, how it performs them, and when it performs them as it uses its resources to perform activities, given its industry, to create superior customer value [...] and put[s] itself in a position to appropriate the value". Following this definition, Afuah (2004) focuses on the *BM as an activity system*. This perspective regards the BM as a formal portrayal of a firm on the level of specific activities (Gassmann et al., 2017). This is in line with Zott and Amit (2010), who conceptualise the BM from an activity system perspective. Zott and Amit (2010) define a firm's BM as "an activity system of interdependent organizational activities centred on a focal firm, including those conducted by the focal firm, its partners, vendors, or customers", and indicate that this system "may transcend the focal firm and span its boundaries, but will remain firm-centric" (Zott & Amit, 2010, pp. 217–218). This definition is also employed by Amit and Zott (2015) and Chesbrough (2010) and is near to that of Afuah (2004) in that the BM is conceptualised as a system identifying what activities should be performed, how they should be performed, and by whom they should be performed. However, whilst Afuah's (2004) definition addresses the BM concept in terms of an individual enterprise, Zott and Amit (2010) include the whole value network in their approach. Thus, the notion of the activity system partly puts forward a new understanding of firm boundaries, broadening the scope of a focal firm to considering it as a network of activities including external resources (Gassmann et al., 2017).

Besides the value logic and the activity system perspective on BMs, the literature also highlights a *cognitive view on BMs*. This view puts the BM as a model or the logic of how firms do business in the centre of its reasoning and structures the managerial understanding of a firm (Gassmann et al., 2017, p. 46). The BM is regarded as a recipe that explains how a specific type of firm is doing business and is seen as a blueprint or template that can be imitated and used by

a variety of firms (Gassmann et al., 2017, p. 46). Following this view, Osterwalder et al. (2005, p. 4) describe the BM as “a blueprint of how a company does business. It is a conceptual tool that contains a set of elements and their relationships and allows expressing a company’s logic of earning money. It is a description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate a profitable and sustainable revenue stream”. Osterwalder et al. (2005) express the notion that a BM is an abstraction that describes a business on the conceptual level. According to that, Lindgren et al. (2010, pp. 123–124) conclude that the designers of a BM are initially challenged to identify the key elements of a BM before they are allowed to innovate that same BM.

A sampling of often-cited and most frequently-used definitions on the BM concept is exemplified in table 1. Further overviews of BM definitions are provided by Baden-Fuller and Morgan (2010), Brettel et al. (2012), Coombes and Nicholson (2013), Foss and Saebi (2017a), Massa et al. (2017), Schallmo (2014a), and Zott et al. (2011).

Table 1: Selected definitions of a business model

Author(s)	Definition
Amit and Zott (2001, pp. 494–495)	A BM “depicts the content, structure and governance of transactions designed so as to create value through the exploitation of business opportunities”.
Magretta (2002, p. 87)	A BM “answers Peter Drucker’s age-old questions: Who is the customer? And what does the customer value? It also answers the fundamental questions every manager must ask: How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?”.
Morris et al. (2005, p. 727)	A BM “is a concise representation of how an interrelated set of decision variables in the areas of venture strategy, architecture and economics are addressed to create [a] sustainable competitive advantage in defined markets”.
Osterwalder et al. (2005, p. 10)	“A business model is a conceptual tool that contains a set of elements and their relationships and allows [for] expressing the business logic of a specific firm. It is a description of the value a company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, in order to generate profitable and sustainable revenue streams.”
Shafer et al. (2005, p. 202)	“We define a BM as a representation of a company’s underlying core logic and strategic choices for creating and capturing value within a value network.”
Teece (2010, p. 173)	“A business model articulates the logic and provides data and other evidence that demonstrates how a business creates and delivers value to customers. It also outlines the architecture of revenues, costs, and profits associated with the business enterprise delivering that value.”
Timmers (1998, p. 4)	A BM is “an architecture for the product, service and information flows, including a description of the various business actors and their roles; and a description of the potential benefits for the various business actors; and a description of the sources of revenues.”
Weill and Vitale (2001, p. 17)	A BM describes “the types of assets a company sells and the rights it grants customers to use those assets”.
Wirtz (2010, p. 274)	“A business model reflects the operational and output system of a company, and as such captures the way the firm functions and creates value.”
Wirtz et al. (2016, p. 41)	BMs are “a simplified and aggregated representation of the relevant activities of a company. It describes how marketable information, products and/or services are generated by means of a company’s value-added component. In addition to the architecture of value creation, strategic as well as customer and market components are taken into consideration, in order to achieve the superordinate goal of generating, or rather, securing the competitive advantage.”
Zott and Amit (2010, p. 216)	A BM is “a system of interdependent activities that transcend the focal firm and spans its boundaries”.

Although the review of the BM concept highlighted that there is no generally accepted definition of the BM, there is high-level agreement on a few issues. First, there is an emerging consensus that the concept describes how firms create, deliver, and appropriate value (Osterwalder et al., 2005; Shafer et al., 2005; Zott et al., 2011). Second, there is widespread agreement to define BMs in terms of sets of components and their interrelationships, e.g., customer segment, value proposition, revenue model, and key partners (Chesbrough & Rosenbloom, 2002; Johnson et al., 2008; Osterwalder et al., 2005). Third, it is commonly acknowledged that, although the BM is centred on a focal firm, it transcends the boundaries of any firm (Afuah, 2004; Amit & Zott, 2001; Casadesus-Masanell & Ricart, 2010; Zott et al., 2011). Even though there is no commonly agreed on definition of the BM, it is possible to find some categorisations of the existing BM literature. The most prominent of these categorisations are detailed in the following sections.

2.1.1.2 Categorisation of Definitions

Wirtz et al. (2016, pp. 38–39) state that BM understandings vary according to the abstraction level that is used, including the differentiation into operational and strategic BM views. Based on this, they categorise different understandings of the BM concept with the aim to illustrate the development of basic BM approaches in the direction of a converging BM view. Wirtz et al. (2016) differentiate between three levels of understanding of the BM along the dimensions from the operational to the strategic scope of action and from the product to the industry level. The three levels include the technology-oriented and the organisation-oriented approaches with an operational scope of action, and the strategy-oriented approach with a strategic scope of action:

- *Technology-oriented approach*

According to the technology-oriented approach, BM definitions have a very detailed viewpoint in considering the BM to be a small part of a company, and thus a BM represents how the resources flowing into the company are transformed into market services through the internal service creation process (Wirtz, 2000, p. 81; Wirtz et al., 2016, p. 38).

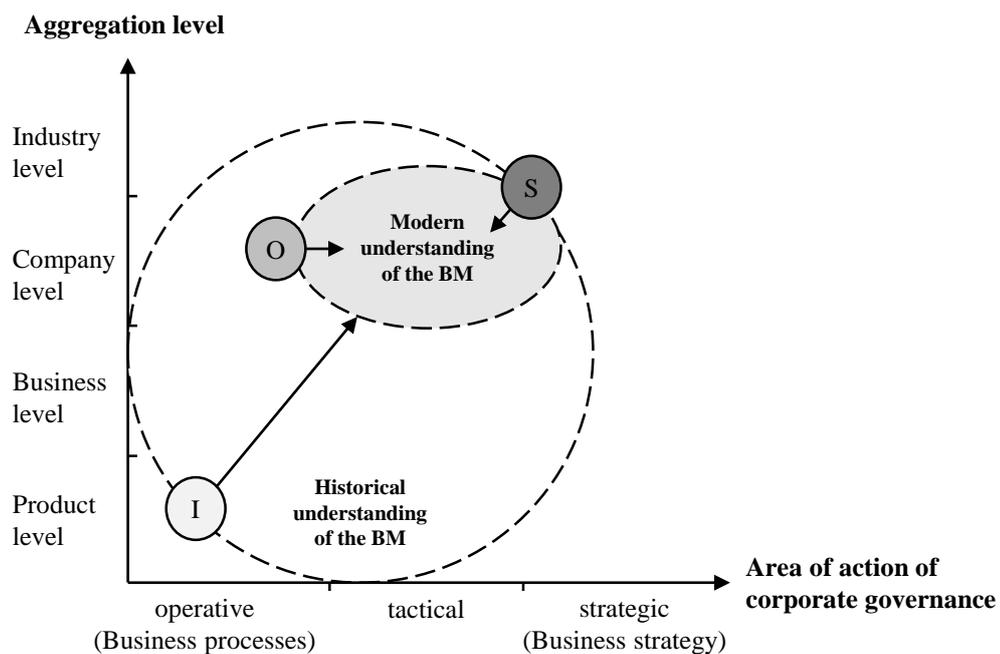
- *Organisation-oriented approach*

Under the organisation-oriented approach, authors regard the BM as an analysis tool for the abstract representation of the structure or architecture of an entire company (Wirtz, 2010, p. 50; Wirtz et al., 2016, p. 38).

- *Strategy-oriented approaches*

Finally, strategy-oriented approaches include competitive and value creation aspects and core competencies beyond the internal company perspective in their view, which creates a close link between BM and strategy (Chesbrough & Rosenbloom, 2002, p. 2; Wirtz, 2010, p. 56).

This development of basic BM approaches in the direction of a converging BM view is illustrated in figure 2, with the aggregation level on the y-axis and the area of action of corporate governance on the x-axis.



Legend:

- Ⓘ Technology-oriented approach
- Ⓞ Organisation-oriented approach
- Ⓢ Strategy-oriented approach

Figure 2: Development of a converging business model view (based on Wirtz et al. (2010))

In comparison to the former classification, Zott et al. (2011) adopt a different viewpoint to classify the BM concept. They found that BM definitions differ in their scope and conceptual focus. They argue that most definitions restrict themselves to an individual enterprise and focus

on value creation and value offerings, although there are many variations on this. Based on their literature review and classification, Zott et al. (2011, p. 1020) explain that “(1) the BM is a new unit of analysis that is distinct from the product, firm, industry, or network; it is centred on a focal firm, but its boundaries are wider than those of the firm; (2) BMs emphasise a system-level, holistic approach to explaining how firms ‘do business’; (3) the activities of a focal firm and its partners play an important role in the various conceptualisations of BMs that have been proposed; and (4) BMs seek to explain both value creation and value capture”. Based on these emerging themes, Lambert and Davidson (2013, p. 669) provide a catalyst for a more unified study of BMs by producing a cross-sectional table of BM definitions. This cross-sectional table illustrates how BM conceptualisations differ in their scope and conceptual focus:

- *Conceptual focus*

Considering the conceptual focus, Lambert and Davidson (2013) differentiate between definitions that put the focus on activities (Afuah, 2004; Demil & Lecocq, 2010; Magretta, 2002; Zott & Amit, 2010) and definitions that put the focus on value (Björkdahl, 2009; Teece, 2010; Weill & Vitale, 2001).

- *Scope*

Considering the scope, some definitions examine the BM to understand how individuals (e.g., entrepreneurs) interact to develop a BM (Doganova & Eyquem-Renault, 2009) or align the concept to the individual enterprise (Chesbrough & Rosenbloom, 2002), while others include the whole network in their considerations (Zott & Amit, 2010).

Lambert and Davidson (2013, p. 669) argue that the cross-sectional table distinguishes, e.g., Amit and Zott's (2001) BM conceptualisation from other BM conceptualisations, such as that of Morris et al. (2005). Consequently, each BM definition can be classified into one of four resulting categories of the cross-sectional table. To give a more detailed explanation, whilst Afuah's (2004) definition denotes the BM concept to the individual enterprise and thereby contrasts that of Zott and Amit (2010) who include the whole value network in their BM description, both studies focus on activities. In addition, whilst Weill and Vitale (2001) refer to electronic BMs, thereby concentrating on interactions between the entity and other actors in the value network, Osterwalder et al. (2010) place more emphasis on the factors internal to a company, as they also have value as the BM's conceptual focus. Table 2 illustrates the cross-sectional table including some definitional examples.

Table 2: A cross-section of business model definitions (based on Lambert & Davidson (2013, p. 669))

		Scope	
		Network	Enterprise
Conceptual focus	Activities	A BM is “a system of independent activities that transcends the focal firm and spans its boundaries. The activity system enables the firm, in concert with its partners, to create value and also to appropriate a share of that value.” (Zott & Amit, 2010, p. 216)	“A business model is the set of which activities a firm performs, how it performs them, and when it performs them as it uses its resources to perform activities, given its industry, to create superior customer value (low-cost or differentiated products) and put itself in a position to appropriate value.” (Afuah, 2004, p. 9)
	Value	A BM is “a description of the roles and relationships among a firm’s consumers, customers, allies, and suppliers that identifies the major flows of product, information, and money, and the major benefits to participants.” (Weill & Vitale, 2001, p. 34)	“A business model describes the rationale of how an organisation creates, delivers, and captures value.” (Osterwalder et al., 2010, p. 14)

Alongside these two conceptualisations, BMs have also been analysed according to two discourses that deal with the functions, i.e., two different uses of the BM concept (Demil & Lecocq, 2010; Fjeldstad & Snow, 2018; Spieth & Schneider, 2016). While the first use emphasises a static and operational perspective—describing the logic and structure of the business—the second use refers to a more transformational and dynamic perspective that describes the opportunity facilitation and the commercialising function (Spieth & Schneider, 2016, pp. 673–674). It should be noted that Nyström and Mustonen (2017, p. 129) differentiate more clearly between a transformational-, network-, and dynamic approach and that these three approaches will be discussed as one in this work as a counterpart to the static view:

- *Static and operational perspective*

The static approach enables descriptions and classifications of a BM and refers to a BM as a blueprint, a guiding framework, or even a recipe (Amit & Zott, 2001; Baden-Fuller & Morgan, 2010; Chesbrough & Rosenbloom, 2002; Magretta, 2002). The static view helps organisations to operate all their activities effectively and efficiently to generate value and conceptualises its mechanisms to create value for customers (Demil & Lecocq, 2010, pp. 228–229). Fjeldstad and Snow (2018, p. 33) inferred that researchers who take up the static view typically refer to the elements covered by Drucker (1954), namely customers, resources, and revenue sources and their inter-relationships with a firm’s activities.

- *Transformational and dynamic perspective*

The dynamic view emphasises change and innovation, either in an organisation or in the BM itself (Chesbrough, 2007; Demil & Lecocq, 2010; Johnson et al., 2008) with the potential to shake whole industries (Demil & Lecocq, 2010, pp. 228–229). This perspective deals with the discourse on how a firm adapts and modifies the components of its BM over time to respond to changes and disruptions in its environment (Fjeldstad & Snow, 2018, p. 33). Nyström and Mustonen (2017, p. 129) propose that the dynamic approach relies on the networked nature of business relationships, strategic agility and adaptability, and flexibility. According to the authors, this implies “a state of always becoming; thus, the ‘perfect’ and ‘unique’ BM is not the goal per se. Rather, the BM is and should be adaptive, changeable, and flexible, and created in conjunction with the firm’s business partners, network actors and other[s]” (Nyström & Mustonen, 2017, p. 129). Thus, in some way, the dynamic perspective reflects Forrester’s (1958, p. 66) objective to transform an organisation so that it has a better chance of success.

Overall, three approaches to categorise definitions of the BM concept were identified in the context of this paper. As a first approach, the BM is distinguished according to three levels, namely the economic, operational, and strategic levels. Second, the BM can be classified using a cross-sectional table along the two dimensions conceptual focus and scope. Finally, based on the functions or uses of a BM, two perspectives are identified under the static and the dynamic views. In a nutshell, Massa et al. (2017) summarised that “definitions of BMs in the ‘BM as [an] attribute of real firm’ interpretation range from a ‘set of activities, as well as the resources and capabilities to perform them—either within the firm, or beyond it through cooperation with partners, suppliers or customers’ (Zott & Amit, 2010, p. 217), to the ‘firm’s underlying core logic and strategic choices for creating and capturing value within a value network’ (Dahan et al., 2010, p. 328, building on Shafer et al., 2005)”. Thereby, Massa et al. (2017) subsumed the central aspects that are addressed in the multitude of definitions found in the literature.

To identify a suitable definitional approach for this paper, the literature review of Wirtz et al. (2016), in which 21 of the most current and widely-used definitions were analysed, was used to formulate a new definition. Since the definition by Wirtz et al. (2016) is derived from an extensive material base, it will be used as a basis for this paper. Wirtz et al. (2016, p. 41) define an integrated BM as “a simplified and aggregated representation of the relevant activities of a company. It describes how marketable information, products and/or services are generated by

means of a company's value-added component. In addition to the architecture of value creation, strategic as well as customer and market components are taken into consideration, in order to achieve the superordinate goal of generating, or rather, securing the competitive advantage".

As the literature review shows, many different BM taxonomies have been constructed, and each BM definition focuses on different characteristics which are likely to produce a classification that identifies different BM elements to be analysed. In this connection, Baden-Fuller and Morgan (2010, p. 166) compare BMs with recipes that require ingredients, which are a variety of elements, including resources, capabilities, products, customers, technologies, markets, and so forth. The following chapter provides an overview of the basic component-oriented view that is present in many understandings of the terminology of the BM.

2.1.2 Descriptive Components

Besides the clarification of the definition of the term BM, the extraction of relevant components is considered relevant to develop a clear understanding of the BM concept. The extent of definitions and perspectives of BMs evidenced a basic component-oriented view that is present in many understandings of the terminology (Wirtz et al., 2016, pp. 41–42). However, there is still some disagreement in the literature regarding the relevant components. The previous chapter outlined many different ways of defining the BM, with each definition focused on different characteristics and based on new ideas, new empirics, or novel business experiences (Baden-Fuller & Morgan, 2010, p. 160). Each definition thus reveals different components to be analysed. Furthermore, instead of the term *component* (Wirtz, 2010), some authors use other terms with a similar meaning, such as *constituents* (Hamel, 2000), *objects* and *concepts* (Weiner et al., 2010), *elements* (Johnson et al., 2008), and *building blocks* (Osterwalder et al., 2010), or they directly address the individual elements (Amit & Zott, 2001; Magretta, 2002). Therefore, the terms *element* and *component* are used synonymously. In the following, the central approaches to the identification and analysis of the various components are detailed. This is necessary because the identification of a BM's core components is essential in a preliminary step before dealing with the complex processes of BMI and venture foundation later.

Demil and Lecocq (2010, p. 232) explain that the BM concept can be broken down in two ways. While some authors (e.g., Johnson et al., 2008) describe the main components of a BM for a specific organisation under ex-ante (e.g., resources, value network, customers) study, others

rely on a more inductive approach to distinguish BM components and their interactions (e.g., Casadesus-Masanell & Ricart, 2010). Siggelkow (2002, p. 126) argues that the advantage of using predefined (ex-ante) components, is that changes in these can constantly be traced across a study right from the beginning, although the disadvantage is that the same components are assumed to be equally relevant for every firm. Furthermore, there are great differences with regard to the degree of abstraction, the detailing, and the complexity of the components (Bieger & Reinhold, 2011, p. 21). While some authors (Hamel, 2000; Voelpel et al., 2004) consider only a few components and have a greater focus on a minimum of aspects, others (Osterwalder et al., 2005; Osterwalder et al., 2010; Wirtz, 2010) adopt more comprehensive considerations (Wirtz et al., 2016, p. 42).

In terms of time, among the first and most cited papers to name components of the BM were Hamel (2000) and Afuah (2004). Prahalad and Hamel (1990) developed a conceptual framework for the BM and elucidated its components and their interactions. Their framework adopts the structures of components by other researchers that were previously put forward. The authors uncovered four major components of the BM, including the customer interface, core strategy, strategic resources, and value network. Each of these contains three to four sub-components:

- *Customer interface*

The customer interface is identified as fulfilment and support, information and insight, relationship dynamics, and pricing structure.

- *Core Strategy*

The core strategy is defined as including the business mission, product and market scope, and basis for differentiation.

- *Strategic resources*

Strategic resource factors are described as core competencies, strategic assets, and core processes.

- *Value network*

The value network is described as including suppliers, partners, and coalitions.

Next to Prahalad and Hamel (1990), Afuah (2004) focuses on firm profitability and describes the BM as a money-making process. Following this baseline, he identifies eight components

that are factored in as five major components, which pairwise interrelate with each other. The five major components include industry factors, resources, activities, positions, and costs (Afuah, 2004).

To date, many other overviews have been prepared that subsume and compare the collection of components according to the individual BM definitions. Morris et al. (2005), Shafer et al. (2005), and Osterwalder et al. (2005) provide detailed literature reviews to uncover the previously most cited definitions and components of the BM. Shafer et al. (2005, p. 200) uncovered 42 BM components across 12 different definitions during the years 1998–2002. They found that some of these components appear in only one definition, whereas other components are repeatedly mentioned. Morris et al. (2005) present an overview to build a unified perspective of BMs since the late 1990s, for which they set a strong entrepreneurial focus (Lindgren et al., 2010, pp. 124–125). They identified the number of BM dimensions to range between four and eight. According to their overview, the most consistently emphasised components include the firm's value offering, economic model, customer interface and relationship, partner network and roles, internal infrastructure and connected activities, and target markets (Morris et al., 2005, p. 728).

Furthermore, Osterwalder et al. (2005) summarised previous academic work on BMs and developed the so-called Business Model Canvas, which is structured into nine components. The Business Model Canvas is non-technical, less complex, and makes it easy to communicate, which is why it is applied widely and has become highly relevant in practice (Heikkilä et al., 2018, p. 109). The Business Model Canvas divides nine components that are, in addition to the value proposition, assigned to three partial models, namely the customers, value offer, and financial model. A description of the partial models and nine components by Osterwalder et al. (2005, pp. 15–19) is given in the following:

- *Value proposition*

The value proposition is in the centre of the Canvas and describes the market service offered to solve customer problems and satisfy customer needs. It contains the reason why customers turn to one company rather than to another. The value proposition can be products or services in general or attributes described in more detail, e.g., special resistance or design specifications.

- *Customer model*

The *customer segments* component defines the different groups of people or organisations to be reached or served by an organisation. A specific customer benefit can often be assigned to each group. *Customer relationships* describe the way a company contacts and maintains relationships with its customers while the *channels* component describes how a company reaches and addresses its customer segments to deliver the value proposition through communication, distribution, and sales channels. In summary, the customer segments, customer relationships, and distribution channels make up the customer model.

- *Value offer model*

Key partnerships include the network of suppliers, partners, and other stakeholders involved in the realisation of the BM. The key partnerships are used to outsource some activities and acquire resources from outside the company. The *key activities* define the most significant activities that a company performs to deliver the value proposition while *key resources* describes the assets that are required to ensure profitable fulfilment of the value proposition. They include technologies, facilities, people, etc. The components of key partners, key activities, and key resources form the value offer model.

- *Financial model*

The *cost structure* component defines the main cost items incurred in the execution of the BM while the *revenue streams* component provides an overview of the key revenue items of the BM and the revenues that result from successfully offering a value proposition. The two components of the cost and revenue model are opposite to each other and together form the financial model.

Figure 3 illustrates the Business Model Canvas and its components. As shown in the figure, the value proposition of a company is at the centre of the presentation. On the left side of the value proposition, the part of the Canvas that analyses what is needed to produce or offer the value

proposition (value offer model) is presented, and on the right side of the value proposition, the factors of a BM that shed more light on the market view (customer model) are shown. The two fields at the bottom represent the financial indicators (financial model).

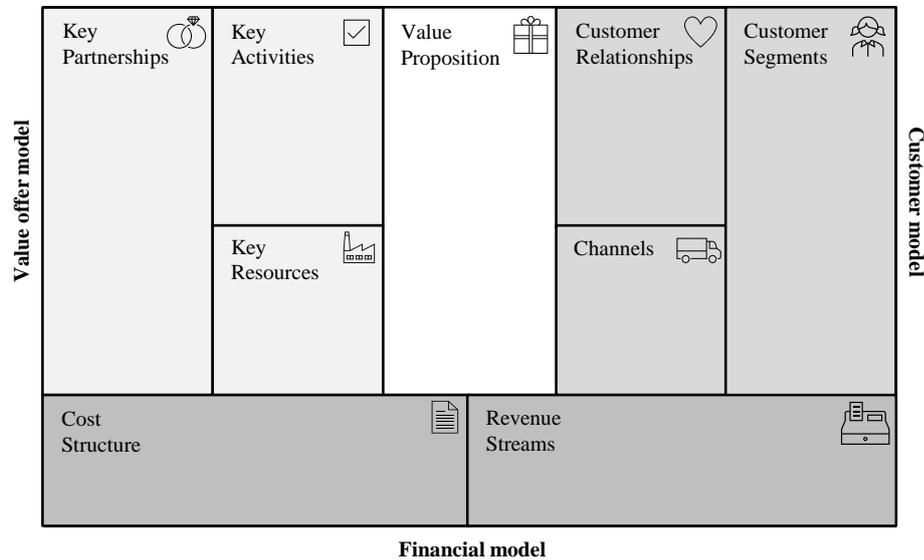


Figure 3: The Business Model Canvas (based on Osterwalder et al. (2010))

More recent attempts to provide an overview of BM components were made by Bieger and Reinhold (2011), Schallmo (2014b), Spieth and Schneider (2016), Wirtz et al. (2016), and Clauss (2017). The most frequently discussed components are linked to a firm's value proposition, value creation and delivery, and value capture processes or definitions relating to the value logic (Bocken & Short, 2016; Chesbrough & Rosenbloom, 2002; Teece, 2010). According to Coombes and Nicholson (2013, p. 657), allusions to the creation, delivery, and capture of value are evident in six out of the eight articles on BMs that have been published in marketing journals between 1970 and 2011. Because the BM is either explicitly or implicitly used as a tool to understand how a firm delivers value to its customers, entices customers to pay for that value, and converts those payments into profit (Belussi et al., 2019, p. 11), it stands to reason that a BM's components are related to the value logic and that the components thus serve as building blocks for a firm's orientation along the value dimensions. Related models describe the value proposition as the centre of the model, followed by the customer segments, partnerships, distribution channels, key resources and competencies, and the cost and revenue structure.

Spieth and Schneider (2016, pp. 675–678) make use of this three-dimensional BM structure, including a firm's value offering, value creation architecture, and revenue model and provide an overview that facilitates the deduction of a general description of each of the three dimensions. They explain the three dimensions as follows:

- *Value offering dimension*

The value offering dimensions captures the value proposition of a firm, its target customers, and its resulting strategic and competitive positioning in the market.

- *Value creation dimension*

The value creation dimension describes how a firm realises its value offering by looking at its core competences and resources, its transactive and organisational structure, its distribution logic, its internal activities and value chain, and its external value creation network.

- *Revenue model*

The revenue model explains how a firm generates profits by looking at its economic character in terms of its earnings and cost logic.

Concluding, Schallmo (2014b, p. 22) provides a comparison of existing approaches to BM elements that highlights how often the components overlap in the existing literature, and which of the components are frequently or rather rarely addressed. Thereby, Schallmo (2014b) differentiates between seven dimensions, including the original dimensions of the customer, value proposition, value creation, financial, and partner dimension as superordinate categories. He also proposes the BM vision and BM leadership dimensions as additional superordinate categories. However, both the vision and the leadership dimension are only taken up in a few papers. The overview of Schallmo's (2014b) comparison of existing BM elements is given in table 3.

Table 3: Comparison of existing BM elements (based on Schallmo (2014, p. 22))

Author(s)	Business model vision	Customer dimension			Customer benefit		Value creation dimension			Partner dimension		Financial dimension		Business Model leadership
		Cus-tomer seg-ment	Cus-tomer channels	Cus-tomer relation-ship	Services	Value propo-sition	Pro-cesses	Resour-ces	Skills	Partner	Partner channels	Costs	Turn-over	
Bieger and Reinhold (2011, p. 33)	x	x	x		x	x		x					x	
Chesbrough (2007, p. 13)		x			x	x		x		x		x	x	
Hamel (2002, p. 00)		x	x		x	x		x		x			x	
Johnson (2010, p. 4)		x			x	x		x				x	x	
Lindner and Cantrell (2000, p. 3)		x	x	x	x	x		x					x	x
Lindgarth et al. (2009, p. 2)		x			x			x				x	x	
Osterwalder (2004, pp. 44-102)		x	x	x	x	x		x		x		x	x	
Osterwalder and Pigneur (2010, p. 16)	x	x	x	x	x	x		x		x		x	x	
Teece (2010, p. 189)		x			x	x						x	x	
Voelpel et al. (2004, p. 259)		x				x		x						x
Wirtz (2010, p. 119)	x	x	x	x	x	x		x		x		x	x	x

One of the most recent attempts to structure the BM components is derived from the work of Wirtz et al. (2016). The integrated BM view by Wirtz et al. (2016, pp. 41–42) summarises existing BM components and thereby derives nine essential components that can be assigned to three categories, including the strategic, customer and market, and value creation components:

- *Strategic components*

First, the authors identify the strategic components as a central category of a BM. They explain that *strategy* has historically had an essential influence on the BM concept, which is reflected in the various approaches of components. Furthermore, material and immaterial, as well as internal and external *resources and competencies* or capabilities, are regarded as important components of this (Afuah, 2004; Demil & Lecocq, 2010; Osterwalder et al., 2005; Osterwalder et al., 2010). In addition, *networks and partnerships*, including mostly external interactions of a BM, are taken into consideration as part of the BM (Hamel, 2000; Voelpel et al., 2004).

- *Customer and market components*

Second, Wirtz et al. (2016) define the customer and market as a category. The special importance of the customer is highlighted by the fact that half of the reviewed approaches by Wirtz et al. (2016) consider the role of the *customer* as a component of the BM (Hamel, 2000). The customer and market category also portrays the *market offer model*, at the centre of which lies the value proposition (Demil & Lecocq, 2010). Furthermore, competitors and the entire market structure are also considered in the literature (Afuah, 2004). Next to the customer and market offer, the *revenue model* represents the third component of this category which has frequently been mentioned (Osterwalder et al., 2005; Osterwalder et al., 2010).

- *Value creation components*

Finally, Wirtz et al. (2016) identify value creation as the third category. Herein, the *manufacturing model* depicts the frequent use of the terms for service provision (Afuah, 2004). The *procurement model*, which describes the acquisition of resources and information, is subsequently taken into account (Yip, 2004), while the last component to be considered is the *financial model* that reflects the function of financial control and planning (Afuah, 2004; Demil & Lecocq, 2010; Osterwalder et al., 2005).

The partial models and corresponding components based on Wirtz et al.’s (2016, p. 44) analysis are illustrated in figure 4. Moreover, Wirtz et al. (2016, p. 42) find that the most consensus regarding the importance of specific components is found with the offerings and resources. On the other hand, they show that there is little agreement concerning strategy, revenue, and procurement.

Components of the integrated BM				
Strategic components	Strategy model <ul style="list-style-type: none"> Strategic positions and development paths BM value proposition 	Resources model <ul style="list-style-type: none"> Core competencies & competencies Core assets & assets 	Network model <ul style="list-style-type: none"> BM networks BM partners 	
	Customer & market components	Customer model <ul style="list-style-type: none"> Customer relationships/target groups Channel configuration 	Market offer model <ul style="list-style-type: none"> Competitors Market structure Value offering/ products & services 	Revenue model <ul style="list-style-type: none"> Revenue streams Revenue differentiation
		Value creation components	Manufacturing model <ul style="list-style-type: none"> Manufacturing model Value generation 	Procurement model <ul style="list-style-type: none"> Resource acquisition Information

Figure 4: Components and partial models of the integrated business model (based on Wirtz et al. (2016, p. 44))

The most recently cited articles and most important contributors to BM’s component analysis were presented in this chapter. To some extent, these can also be linked to BM design and BMI. The previous chapter gave an overview of the recent literature reviews and attempts to structure BM components. Moreover, Hamel (2000) and Demil and Lecocq (2010) explain that a BM’s performance not only depends on the content of the individual components but also on the integration between and within these components and the fit between them. Andries et al. (2013, p. 290) deduce that a BM can be described as a configuration of interdependent BM components. Mismatches, on the contrary, occur when BM components have adverse or conflicting implications for other components (Lehoux et al., 2014). Thus, Schallmo (2014b, p. 6) summarises that a firm’s objective is to combine the BM elements in such a way that they

reinforce each other so that growth can be achieved and the BM cannot easily be imitated by competitors.

Furthermore, the selection of a specific BM framework depends on the desired objective. Designing a coherent BM in which all elements are optimised individually is not an easy task, because the BM is quite a complex concept. To date, the detailed Business Model Canvas framework proposed by Osterwalder et al. (2005) is widely used in several academic studies (Berends et al., 2016; Cortimiglia et al., 2016). Osterwalder et al. (2005) propose the use of their BM conceptualisation to help managers to simply and easily describe the essential components of a BM and their relationships by using a graphical structure that puts the components into relation. As a result, whenever talking about BMs, the Business Model Canvas is employed for explanation in the studies incorporated in this paper.

2.2 Business Model Innovation

In recent years, the BM itself has increasingly become a source of innovation and competitive advantage (Hossain, 2017, p. 342). BMI has become a topic of great importance in the fields of innovation and entrepreneurship (Ghezzi & Cavallo, 2020, p. 521) and many scholars agree that firms should look beyond mere product/service or process innovations as their unit of analysis for innovation efforts and instead focus on innovating their entire BM (Chesbrough, 2007, 2010; Lindgardt et al., 2013; Lubik & Garnsey, 2016). However, creating a new BM or changing an established BM is a major challenge, as Lindgren et al. (2010, p. 125) put it: “Having a conceptualisation of BMs is one thing, innovating them is quite another”.

Following this call for analysis on BMI, Foss and Saebi (2017b, p. 206) and Schneider and Spieth (2013) conducted a literature review and distinguished different streams of BMI research, including the conceptualisation of BMI, the elements and process of BMI, and the concept’s prerequisites and outcomes. Accordingly, chapter 2.2.1 first provides a distinction of the three terms idea, invention, and innovation on the basis of which the definitions and dimensions of BMI are elaborated. This is followed by the theoretical background on BMI, with a focus on theories and methods of learning and experimentation. Afterwards, structured process models of BMI are outlined. The BMI process and its phases are explained in detail. Finally, empirical insights regarding the antecedent and outcome factors of BMI are highlighted.

2.2.1 Terminology

Before the term BMI is defined and conceptualised, it is necessary to explain what is understood by innovations in general and hence the fundamentals of the term *innovation* are amplified and differentiated from the two terms *idea* and *invention*, which are closely related to innovation. Building on this foundation, the term BMI will then be considered in detail.

2.2.1.1 Idea, Invention, and Innovation

The higher-order term *innovation* was first mentioned in 1939 in the USA in the work “Business Cycles in the Context of Economic Theory” by the economist Josef Schumpeter and has become widely known (Schumpeter, 1939). The term is closely related to the Latin verb *innovare*, which means to create something new (Rogers, 1983, p. 11). However, in scientific literature and business practice, innovation is often controversially discussed and synonymously used with what is understood as an idea or invention (Vahs & Brem, 2015, p. 21). Thus, it is essential to clearly distinguish between these three terms before elaborating on BMI in detail. A definition and delimitation of the terms idea, invention, and innovation is given in the following to create a uniform understanding on which this paper subsequently builds.

The term *idea* refers to a structured thought that develops continuously and arises either spontaneously or with the help of creativity methods (Vahs & Brem, 2015, p. 21). It often includes a proposal for a solution to a problem or an unsatisfying circumstance (Minder, 2001, p. 71). If an idea refers to how an organisational activity can lead to superior performance in competition, Rentmeister and Klein (2003, p. 20) speak of a business idea, while an *invention* refers to the technical realisation of new scientific findings or new combinations thereof (Haß, 1983, cited in Bullinger, 1994, p. 35). An invention can further be understood as the first implementation of an idea and the production of prototypes, although market-oriented exploitation is not considered in this context (Bullinger, 1994, p. 35). If an invention, whether planned or unplanned, finds its way into the economic cycle, it is known as *innovation*. An innovation is, therefore, an invention that is successfully established on the market and it is thus understood to be the first economic use or the first economic application of an invention to achieve corporate goals (Haß, 1983, p. 7; Perillieux, 1987, p. 16). Hence, Hering and Phillips (2005, p. 3) define innovation “as putting ideas into valuable action” whereby the authors regard

innovation as a business process since an idea must be moved through the whole process from the concept stage to the launch of a new product or service (Hering & Phillips, 2005, p. 3).

Schumpeter (1939) identified several sources of innovation. These include the introduction of new goods, production methods, markets, supply sources, or the reorganisation of industries (Amit & Zott, 2001, pp. 496–497). However, the research to date lacks a generally applicable and uniform definition of what innovation is (Vahs & Brem, 2015, p. 21). While numerous approaches to classify innovations are found in the literature, this paper cannot delineate these in-depth but only provides a brief overview as is relevant to the overall context. Delineations of the term *innovation* mainly include its differentiation on the basis of the criteria complexity, reference unit, degree of novelty or uncertainty, and object or innovation type (Schallmo, 2014b, p. 6):

- *Complexity criteria*

First, complexity is based on the diverse internal and external relationships and influencing factors to which an innovation is exposed. On the one hand, the complexity of innovations is enhanced through the variability in the course of their development and, on the other hand, through their quantity and interconnectedness (Vahs & Burmester, 2005, p. 52).

- *Reference unit criteria*

Second, the reference unit determines the novelty property of an innovation and considers from which perspective (i.e., for whom) the innovation object is to be classified as new. In this regard, Gerpott (2005, p. 46) distinguishes between the three criteria company-oriented, customer-oriented, and competition-oriented perspectives. The company-oriented perspective considers the degree of novelty of the innovation object from the company's point of view, while the customer-oriented perspective measures the change in knowledge and behaviour of the customers caused by the innovation. The competition-oriented perspective determines whether the innovation object is already being used by other providers in a defined geographical region.

- *Degree of novelty criteria*

Concerning the degree of novelty, the distinction between an incremental, radical, or disruptive innovation has been established in the literature, relating to the level of innovation intensity (Schallmo, 2013, p. 24). Incremental innovation describes the

continuous and gradual improvement of existing products, services, and BMs while retaining existing solution principles. They are associated with low risk and use of resources and are therefore preferably implemented by companies (Wördenweber & Wickord, 2008, p. 12). In contrast, the degree of novelty in radical innovations is significantly higher, as these innovations aim to satisfy customer needs in a completely new way (Disselkamp, 2012, p. 20). Similarly, disruptive innovations replace already existing products, technologies, services, and BMs or completely displace them from the market due to superior advantages (Christensen, 1997, pp. 102–103).

- *Innovation type criteria*

Finally, according to Schumpeter, innovation types are distinguished between product/service and process innovations (Vahs & Burmester, 2005, p. 44). A great range of definitions and reviews of both product/service and process innovations is provided by different authors (e.g., Alam & Perry, 2002; Antonacopoulou & Konstantinou, 2008; Goulding, 1983; Johne & Snelson, 1988). Product innovations are understood as innovations in a company's range of products or services. Geissdoerfer et al. (2018, p. 167) interpret product and service innovation as “the development of new products and services, the modification of established products and services, or the substitution of one product or service with another one”. Process innovations, on the other hand, are aimed at optimising a company's internal processes and operational procedures (Vahs & Burmester, 2005, p. 73). More recent research attaches particular importance to the innovation type of BMI because it can fundamentally change the value creation logic (Björkdahl & Holmén, 2013, p. 215). Even though product/service and process innovations have traditionally been viewed as the source of innovation and value creation (Zott & Amit, 2015, p. 399), BMIs are argued to be fundamentally different and the only remaining option for companies to innovate as soon as products/services and processes are stable (Amit & Zott, 2012; Casadesus-Masanell & Zhu, 2013). Product innovations, and subsequent process innovations, can only temporarily increase the innovation rate in a given industry and the competitiveness of a company, whereas BMIs can increase and maintain the innovation rate in the long term (Müller-Roterberg, 2020, pp. 64–65). BMIs thus exceed the scope of the mere introduction of a new product/service offering as they open completely new opportunities for how to engage in economic exchanges (Hamel, 2000; Mitchell & Coles, 2003). In line with this, Amit and Zott (2001, p. 508) mention

that the Schumpeterian types of innovation fail to explain the novelty of companies such as eBay, as these can only be explained by a BMI.

The literature on BMIs and their terminology is outlined in chapter 2.2.1.2, thereby highlighting that the presented classification possibilities of innovation, in general, can also be transferred to BMI in particular.

2.2.1.2 Definition of Business Model Innovation

In general, BMI considers the BM as the subject of innovation instead of products/services or processes. It relates to the innovation of a system of products, services, technology, and/or information flows that go beyond the focal firm (Clauss, 2017, p. 387). A BMI fundamentally changes the value creation logic of a company (Björkdahl & Holmén, 2013, p. 215), and it can even redefine the rules for entire industry sectors or result in the reconfiguration of an industry (Jansen & Mast, 2014, p. 27). A good example in this regard is the company Airbnb, which disrupted the traditional value creation logic of the accommodation industry. The company's innovative BM enabled owners of flats and short-term tenants to rent out their living space as short-term accommodation via a platform. With its novel value creation architecture, Airbnb reached a stock market value of over 10 million US dollars within 5 years (Dickey, 2014).

Similar to the scientific discourse of the BM concept, there is no uniform and generally accepted understanding of BMI. Accordingly, the research does not build on an established definition and well-structured literature base (Schneider & Spieth, 2013, p. 9) and thus, as Casadesus-Masanell and Zhu (2013, p. 480) observe, BMI is “a slippery construct to study”. The first definitions of BMI can be found from the year 2000 onwards. The literature focused on the explanatory approach of finding new ways for companies to generate revenue and reach potential investors. Stewart and Zhao (2000) view BMI in terms of how a firm will make money, while Magretta (2002) summarises BMI in terms of how enterprises work. According to her, new BMs are variations on a generic value chain underlying all businesses. A new BM can be seen as a new product for unmet needs or it may focus on process innovation and a better way of making, selling, or distributing an already existing product or service (Magretta, 2002). In subsequent years, more advanced definitions emerged that describe BMI in the sense of the *value logic*, *the activity system*, and *as a process*.

According to the *value logic*, BMI is described as an efficient way of creating value. For example, Markides (2006, p. 20) describes the concept as “the discovery of a fundamentally different BM in an existing business” and postulates that a new BM can be distinguished as an innovation if it either fulfils the unmet needs of current customers or attracts new customer groups (Markides, 2006, p. 20). Chesbrough (2010, p. 358) defines BMI as a “unit of analysis, [to] identify novelty, lock-in complementarities and efficiency”. Furthermore, Teece’s (2010) widely cited definition of the BM as the architecture of the firm’s value creation, delivery, and capture mechanisms serves as the basis for many authors to define and dimensionalise the construct. Thus, BMI can fundamentally be defined as a novel way of how to create and capture value, which requires changes in the value creation, the value delivery, or the value capture of a company (Chesbrough, 2010; Clauss, 2017; Demil & Lecocq, 2010). Building on this, Björkdahl and Holmén (2013, p. 215) argue that BMI is a new integrated logic of how a firm creates and captures value. They explain that BMI is not just a mere product/service or process innovation, but includes new ways to create value and new firm offers (e.g., product/service innovations), new ways for the customers to view a firm’s offers (positioning innovation), new ways of how a firm views its activities (paradigm innovation), and changed operations (process innovation). In essence, BMI is “a new integrated logic of value creation and value capture, which can comprise a new combination of new and old products or services, market position, processes and other types of changes” (Björkdahl & Holmén, 2013, p. 215). Similarly, Stieglitz and Foss (2015) and Foss and Saebi (2017a) emphasise the architecture of the BM and refer to BMI as “designed, novel, and non-trivial changes to the key elements of a firm’s BM and/or the architecture linking these elements”. Mütterlein and Kunz (2017, p. 175) also relate this to a rather broad definition of BMI by referring to the value logic of the BM. They define BMI as “an umbrella for innovation that occurs in one, two, or all of these (value) dimensions” (Mütterlein & Kunz, 2017, p. 175).

Moreover, relating to the BM as an *activity system*, Amit and Zott (2010) describe BMI at a rather abstract level as the process of designing a new or modifying a firm’s extant activity system, that is new to the world or just new to the enterprises under analysis. Later, the two authors specified their understanding of BMI and stated that BMI can be defined as “the design and implementation of an activity system that is new to the focal firm or new to the product-market space in which the focal firm competes” (Zott & Amit, 2015, p. 396). Santos et al. (2009, p. 14) also refer to the BM as an activity system but shift their attention in particular to firms

with pre-existing BMs. They offer a definition that focuses on the BMI as “a reconfiguration of activities in the existing BM of a firm that is new to the product/service market in which the firm competes”.

Besides the value logic and activity system perspective on BMI, some authors assume a *processual perspective* on BMI. Johnson and Lafley (2010, p. 13) define BMI as the ability to change a company as a whole. They regard BMI as an iterative process of developing the BM elements. Similarly, Bucherer (2010, pp. 31–32) and Brenk and Lüttgens (2015, p. 3) refer to BMI as an iterative design process for creating a new BM that either significantly differs from the previous BM in one or more elements or in its dynamic interrelations.

Table 4 illustrates the heterogeneity of understandings of the term BMI by providing an overview of selected definitions.

Table 4: Selected definitions of business model innovation

Author(s)	Definition
Amit and Zott (2010)	BMI is described at a rather abstract level as the process of designing a new or modifying a firm's extant activity system, that is new to the world or just new to the enterprises under analysis.
Amit and Zott (2012)	BMI describes that BMs are innovated by redefining (a) content (adding new activities), (b) structure (linking activities differently), and (c) governance (changing the parties that do the activities).
Aspara et al. (2010, p. 47)	BMI are "initiatives to create novel value by challenging existing industry specific BMs, roles and relations in certain geographical market areas".
Berglund and Sandström (2013, p. 276)	"A business model innovation can thus be thought of as the introduction of a new BM aimed to create commercial value."
Björkdahl and Holmén (2013, p. 215)	"Business model innovation is a new integrated logic of value creation and value capture, which can comprise a new combination of new and old products or services, market position, processes and other types of changes."
Bucherer et al. (2012, p. 184)	"We define business model innovation as a process that deliberately changes the core elements of a firm and its business logic."
Casadesus-Masanell & Zhu (2013, p. 464)	"At root, business model innovation refers to the search for new logics of the firm and new ways to create and capture value for its stakeholders; it focuses primarily on finding new ways to generate revenues and define value propositions for customers, suppliers, and partners."
Foss and Saebi (2017b, p. 201)	BMI comprises "designed, novel, nontrivial changes to the key elements of a firm's BM and/or the architecture linking these elements".
Frankenberger et al. (2013, p. 253)	"At root, a BM innovation can be defined as a novel way of how to create and capture value, which is achieved through a change of one or multiple components in the BM."
Johnson and Lafley (2010, p. 13)	"Seizing the white space requires new skills, new strength, new ways to make money. It calls for the ability to innovate something more core than the core, to innovate the very theory of the business itself. I call that process business model innovation."
Markides (2006, p. 20)	BMI is "the discovery of a fundamentally different BM in an existing business".
Mitchell and Coles (2004, p. 17)	"By business model innovation, we mean BM replacements that provide product or service offerings to customers and end users that were not previously available. We also refer to the process of developing these novel replacements as BM innovation."
Mütterlein and Kunz (2017, p. 175)	BMI as "an umbrella for innovation that occurs in one, two, or all of these (value) dimensions".
Santos et al. (2009, p. 14)	"Business model innovation is a reconfiguration of activities in the existing BM of a firm that is new to the product service market in which the firm competes."
Sorescu et al. (2011, p. 7)	BMI describes "a change beyond current practice in one or more elements of a retailing BM (i.e., retailing format, activities, and governance) and their interdependencies, thereby modifying the retailer's organizing logic for value creation and appropriation".
Yunus et al. (2010, p. 312)	"Business model innovation is about generating new sources of profit by finding novel value proposition/value constellation combinations."
Zott and Amit (2015, p. 396)	BMI is "the design and implementation of an activity system that is new to the focal firm or new to the product-market space in which the focal firm competes".

2.2.1.3 Types of Business Model Innovation

Despite the heterogeneous understanding of the term BMI, recurring core aspects for dimensioning can be identified for a basic understanding of it. Differences in its understanding can be seen in relation to the scope of innovation (number of elements to be changed), the novelty of innovation (new to the firm, market, industry, or world), and the innovation object (adaptation of an existing BM or creation of a completely new BM).

Scope of innovation

Concerning the number of BM elements or value dimensions to be changed, the literature disagrees on the scope of innovation that constitutes a BMI. Some scholars consider that BMs can manifest in modifying only—or at least—a single BM element (Amit & Zott, 2012; Clauss, 2017; Santos et al., 2009; Schneider & Spieth, 2013). Laudien and Daxböck (2016, p. 615) refer to this as a BM transformation. Other authors suggest that it is sufficient to change at least two components (Lindgardt et al., 2013). Some scholars only speak of BMI in cases of a profound or complete change or establishment of multiple BM elements simultaneously and/or changing the interactions between these elements (Demil & Lecocq, 2010, pp. 229–230; Johnson & Lafley, 2010, p. 13; Markides, 2006, p. 19). In more detail, Clauss (2017, p. 392) offers a description of all components of a firm's BM and how each of them needs to be changed in order for BMI to occur. However, many scholarly approaches agree that a change in the value proposition is essential for BMI (Casadesus-Masanell & Zhu, 2013, p. 200). In this regard, Wirtz (2013, pp. 207–208) refers to BMI as a design process of bringing a largely new BM to the market, which is accompanied by an adjustment of the value proposition and/or the value constellation and aims at generating or securing a sustainable competitive advantage. Furthermore, Mitchell and Coles (2003, pp. 16–17) define BMI in terms of the scope by introducing specific terms for different manifestations of BMI. The authors specify a BM improvement as changing a single BM element in a way that substantially enhances a firm's performance. When a firm merely matches the competitor's offerings, the manifestation is called a BM catch-up. In contrast, a BM replacement entails the improvement of at least four of these BM elements. When a firm makes BM replacements that provide product or service offerings that were not previously available to customers, the authors refer to these replacements as an actual BMI (Mitchell & Coles, 2003, pp. 16–17).

In line with Amit and Zott (2012), Spieth and Schneider (2016, p. 682) go beyond the mere consideration of the BM elements to define the scope of BMI. They assume that to achieve a fundamental or paradigmatic change in a BM, not only a particular element but at least one of the three BM value dimensions (value offering, value architecture, revenue model) need to be innovated. Spieth and Schneider (2016, p. 682) state that three distinct BMI types can be distinguished, namely value offering innovation (e.g., fulfilment of an unmet customer demand), value architecture innovation (e.g., exploration of combinations of a firm's resources and competences), and revenue model innovation (e.g., changes to a firm's core earnings logic. Spieth and Schneider (2016, p. 682) further explained that each of these BMI types can occur independently from changes in the remaining dimensions, although changes in one dimension are likely to cause changes and the need for alignment in the other dimensions. Similarly, Schwarz et al. (2016, p. 72) argued that BMs represent complex systems that are subject to strong interdependencies, which is why a change in a single element often requires adaptations in other elements. Hence, even though there is disagreement on how much of a BM has to change for a BMI to take place, there is still agreement that the scope is a relevant dimension (Foss & Saebi, 2017a, p. 15).

Novelty of innovation

The second recurring aspect of dimensioning BMI is the novelty of innovation. In this respect, the literature does not provide a clear guideline concerning up to which degree of innovation one can speak of a BMI. Similar to other innovation types (e.g., product innovation), the novelty describes the degree of BMI in the company, the market, the industry, or the world with the help of the dichotomy incremental, radical, or disruptive. In so doing, the literature mostly distinguishes between the creation of an innovative BM for a company and an innovative BM for an entire industry/market (Johnson et al., 2008, p. 50). To clarify the degree of novelty of a BM, the definitions of incremental, radical, and disruptive innovations can be transferred to BMIs. Bucherer et al. (2012, pp. 192–193) define radical innovations as “innovations characterised by a discontinuity along the two most important dimensions on a macro-level perspective”, which are identified as BMIs being new to an industry or market (Bucherer et al., 2012, pp. 192–193). In this context, *industry* represents the firm view and is to be understood as the sum of firms within one industry, whereas *market* represents the customer view and is to be understood as the sum of customers within the respective industry. Müller-Roterberg (2020, p. 66) explain that radical or disruptive innovations often require a new BM, and hence they are

often, but not always, BMIs. From this, it can be deduced that innovative BMs often have a disruptive character (Müller-Roterberg, 2020, p. 66). Johnson et al. (2008, p. 58) even argued that they see no point in instituting a new BM unless it is game-changing for an industry. Demil and Lecocq (2010, p. 227) see similar fundamental changes through BMI. They argue that new BMs in particular are recognised as radical innovations with the potential to shake entire industries. Similarly, Santos et al. (2009) and Snihur and Zott (2020) use the term BMI to refer to the introduction of a BM that is novel to the product market space in which a firm competes. In a similar vein, Markides (2006, p. 20) emphasises that a new BM must enlarge an existing economy, e.g., by attracting new customers to the market. Thus, the author emphasises the need to discover fundamentally different BMs in existing businesses to qualify as a BMI.

Furthermore, Bucherer et al. (2012, pp. 192–193) describe incremental BMI as BMs that are different from a previous BM, although no discontinuities occur as incremental innovations only entail a tailoring of previous BMs that incorporate, e.g., new capabilities or additional service offerings for a firm. Amit and Zott (2010, p. 8) and Björkdahl and Holmén (2013, p. 215) argue that a BMI does not need to cause major upheaval to a given industry, although, of course, some BMIs can transform an entire industry. Björkdahl and Holmén (2013, p. 214) further claim that a BMI is the implementation of a BM that is new to the firm, referring to the activities conducted before, during, and after the launch of a firm's new BM. Similarly, Lindgren et al. (2010, p. 126) point out that incremental innovations involve making small steps (e.g., using existing knowledge to improve existing products). Thus, incremental BMIs are short-term based and focus on the focal company performing better than it already does.

In sum, there are two overarching views in the literature on the novelty of BMI. First, BMI is referred to as a radical innovation that is the creation of a new BM for an entire industry/market. Second, BMI can be both a radical or incremental innovation that is either the creation of a new BM for an entire industry/market (radical) or the creation of a new BM for a company (incremental). Schneider and Spieth (2013, p. 20) highlight two concepts to explain and differentiate BMI as radical and incremental innovation. They refer to BM developments to speak about incremental innovations, whereas they used the term BMI to focus on more radical innovations (Schneider & Spieth, 2013, p. 20). Lindgren et al. (2010, p. 126) made a further, more precise attempt to classify BMIs regarding their level of radicality. They present four change models, including realisation models, renewal models, extension models, and journey models. Lindgren et al. (2010, p. 126) explain that the main issue of realisation models is to

exploit the current potential within an existing operational framework, and not to cause major changes, e.g., a geographical expansion of a firm, or minor changes in a product line. The authors also state that the main issue for a firm with renewal models is to leverage its core skills to create a disruptively new position on the value curve, e.g., the reconstruction of a service platform or technology base. Extension models induce a BM that causes radical changes by developing new markets. Journey models thus ultimately involve a complete transformation of the original BM, whereby a firm moves to a new operating model (Lindgren et al., 2010, p. 126).

Relying on the two dimensioning core aspects of scope and novelty, Foss and Saebi (2017b, pp. 216–217) constructed a simple typology of four types of BMI. The typology is presented in table 5 as a matrix with the two dimensions *scope* and *novelty*, whereby the authors distinguish between four types of BMI: evolutionary, adaptive, focused, and complex BMI (Foss & Saebi, 2017b, pp. 216–217). The typology depicts that BMs can be developed through varying degrees of innovation, starting from an evolutionary process of continuous fine-tuning up to a revolutionary process of replacing an existing BM (Ramdani et al., 2019, p. 102).

Table 5: Business model innovation typology (based on Foss and Saebi (2017b, p. 217))

		Scope	
		Modular	Architectural
Novelty	New to firm	Evolutionary BMI	Adaptive BMI
	New to industry	Focused BMI	Complex BMI

By scope, Foss and Saebi (2017b) refer to architectural and modular changes. Massive changes such as an entirely novel combination of all BM components are called architectural changes whereas changes in only one constituent BM component are called modular changes. By novelty, the authors indicate new to a company versus new to an industry/market. Evolutionary BMI describes changes in individual components of the BM that occur naturally over time. Adaptive BMI involves changes in an overall BM that are new to a firm but do not transform an entire industry/market. Furthermore, Foss and Saebi (2017, p. 216–217) refer to adaptive BMI when a firm adapts the architecture of its BM as a response to changes in its environment. In comparison, they explain that focused and complex BMI approaches are defined as processes as changes to a BM disrupt an entire industry/market. Focused BMI refers to a firm that innovates within one area of its BM, e.g., a firm that targets a new market segment, while keeping its value proposition. Complex BMI, on the other hand, affects the overall BM of a firm and has the potential to disrupt an entire industry (Foss & Saebi, 2017b, pp. 216–217).

Innovation object

The third recurring aspect for dimensioning BMI is the object of innovation. In this regard, Massa and Tucci (2013, pp. 424–425) propose that BMI can either refer to the design of a novel BM for a newly formed venture, i.e., a start-up firm, or the reconfiguration of an existing BM for an established firm. Similarly, Wirtz (2010, p. 203) distinguishes between the design of a BM in the context of a business start-up on the one hand, and the re-design of an existing BM on the other hand. Thus, Massa and Tucci (2013) and Wirtz (2010) use the term *BM design* to refer to BMI in new ventures or start-up firms. In particular, Massa and Tucci (2013, p. 424) refer to BM design as “the entrepreneurial activity of creating, implementing and validating a BM for a newly formed organisation”. Design can thereby be defined as the activity of changing existing situations into desired ones and creating things that did not yet exist (Simon, 1996). Thus, the notions of innovation and design are closely linked. Innovators—similar to designers—deal with ill-defined problems and attempt to find new and desirable solutions (Zott & Amit, 2015, pp. 404–405).

Start-ups seem to be confronted with BMI more often than established firms because the founders of start-ups rarely create the first draft of a BM that immediately works without any errors, especially in an environment of high uncertainty (Comberg et al., 2014, p. 2). George and Bock (2010, p. 84) explain that BMs represent a form of entrepreneurial opportunity creation explicitly initiated by market imperfections. In order to differentiate a new BM from the established standard, founders deliberately focus on different performance attributes compared to those served by traditional BMs (Zollenkop, 2011, p. 202). In this sense, a start-up can be defined as “a young, innovative and not yet established company in search of a sustainable, scalable BM” (Schramm & Carstens, 2014, p. 11). In the European Startup Monitor, start-ups are defined by three characteristics: 1) they are younger than 10 years, 2) they feature (highly) innovative technologies and/or BMs, and 3) they strive for significant employee and/or sales growth (Kollmann et al., 2016, p. 15). A new venture qualifies as a start-up company when the first of these three characteristics are met, along with one or both of the other two characteristics (Kollmann et al., 2016, p. 15).

However, BMI is not restricted to start-up firms, and innovative BMs are also created by established firms (Bucherer et al., 2012, p. 193). Massa and Tucci (2013, p. 424) use the term BM reconfiguration to capture how organisational resources are reconfigured and new

resources are acquired to change an existing BM. According to Cavalcante et al. (2011, p. 1331), established firms are offered three different options for BMI: BM extension, revision, and termination. BM extension refers to adding activities or extending core processes to an already existing BM. The main drivers for extension are to enlarge a BM or exploit associated commercial opportunities. Under the term BM revision, Cavalcante et al. (2011) point to changing existing processes by removing something of a BM and replacing it with a new process. Factors that induce BM revision include new commercial opportunities that require new ways of doing business, the inefficiency of an existing BM, competitors that are developing new processes that are threatening a company's BM, and new entrant companies that introduce completely new ways of meeting existing demands. Finally, BM termination refers to abandoning or removing an existing business area or unit or closing an entire company.

Besides Cavalcante et al. (2011), Geissdoerfer and Weerdmeester (2019, p. 18) also differentiate four BMI types, whereby they simply call the first type *BMI in start-ups*, to describe the situation when there is no current BM and a new BM is created. The other three BMI types refer to established companies, including BM transformation, diversification, and acquisition. Geissdoerfer and Weerdmeester (2019, p. 18) speak of BM transformation when a current BM is changed into another BM. BM transformation is quite similar to what Cavalcante et al. (2011) named BM revision. Furthermore, Geissdoerfer and Weerdmeester (2019, p. 18) refer to BM diversification when a current BM stays in place and an additional BM is created, which can easily be compared to Cavalcante et al.'s (2011) introduction of BM extension. Finally, BM acquisition refers to the situation where an additional BM is identified, acquired, and integrated, thereby depicting the converse situation to that of BM termination as described by Cavalcante et al. (2011), in that an existing BM is abandoned or removed. BM acquisition is also pointed out by Berends et al. (2016, p. 183) who mention the option that an established firm pursues a new BM alongside an existing one. In such a case, companies can profit from synergies between the new and the old BM, e.g., both BMs might share components such as technological resources (Kim & Min, 2015; Markides & Charitou, 2004).

Altogether, the literature review on the definitions of BMI illustrates that researchers refer to different terms that are used inconsistently and interchangeably and that different types of BMI are introduced in terms of their scope, novelty, and innovation object. An overview of these terms and their definitions is given in table 6.

Table 6: Definitions and terms associated with business model innovation

Author(s)	Definition
Aspara et al. (2013, p. 460)	BM transformation “is a change in the perceived logic of how value is created by the corporation, when it comes to the value-creating links among the corporation’s portfolio of businesses, from one point of time to another.”
Demil and Lecocq (2010, p. 239)	“We view business model evolution as a fine tuning process involving voluntary and emergent changes in and between permanently linked core components [...]”
Laudien and Daxböck (2016, p. 615)	“We define business model transformation as any changes or refinements that fundamentally affect at least one design element of a firm’s extant BM and thus the development of a BM design that is new to the firm.”
Massa and Tucci (2013, p. 424)	We employ “the term business model design [...], which refers to the entrepreneurial activity of creation, implementing and validating a BM for a newly formed organization”. “We use the term business model reconfiguration [...] to capture the phenomenon by which managers reconfigure organisational resources (and acquire new ones) to change an existing BM.”
Mitchell and Coles (2003, p. 16)	“Changing a single BM element in a way that substantially enhances a company’s ongoing performance versus the competition in sales, profits and cash flow is a business model improvement.” “A business model replacement entails improving at least four of these BM elements versus the competition.”
Schneider and Spieth (2013, p. 20)	“Business model development aims at improving an existing BM by using the existing company resources.”
Wirtz (2010, p. 203)	BM design “is observed in the context of a specific formation of a company focusing on the planning process in particular.”

In summary, despite a clear heterogeneity of definitions on BMI, Wirtz and Thomas (2014, p. 36) find some overlapping points in the literature, whereby the change in the value proposition is an important component of BMI. As another aspect, the authors name the change in the value creation structure, also referred to as the value constellation (Wirtz & Thomas, 2014, p. 36), while the function of BMI to renew or create a (new) BM is widely agreed on in the literature. The focus is on changing or further developing individual elements of BMs (Mitchell & Coles, 2004, p. 41) or an entire company (Johnson & Lafley, 2010, p. 13). Thus, BMI serves to make a change in the value creation in a company or an industry/market or to enable the development of new companies or industries/markets. BMI can also take the form of a process (Johnson & Lafley, 2010, p. 13; Mitchell & Coles, 2003, p. 17) that involves the novel or further development of a BM (Wirtz, 2010, p. 203).

The focus of this paper is on BM design, which is referred to as the process of creating an entirely novel BM for a new venture. While the BM according to this paper’s understanding can either be new to a company or to the market/industry, it must fulfil an unmet customer demand or stimulate an additional but not yet consciously perceived demand.

2.2.2 Theoretical Background

The literature presents many theoretical and practical approaches to answer the main question behind BMI, namely how to best select a BM to gain positive value. BMI is thereby depicted as an evolutionary process (Dunford et al., 2010), or as an ongoing learning process (Gavetti & Levinthal, 2000; McGrath, 2010; Sosna et al., 2010), captured in theories such as effectuation (Chesbrough, 2010) and methods such as discovery-driven learning (McGrath, 2010; Teece, 2010), trial-and-error learning (Sosna et al., 2010), and experimentation (Andries et al., 2013; Heikkilä et al., 2018). In scientific language, the named terms have partly been used synonymously, outlined as heuristics (Baker & Nelson, 2005; Sarasvathy, 2001), guidelines (Sull, 2004), principles (Ries, 2011), approaches and techniques (McGrath & MacMillan, 1995), frameworks (Blank & Dorf, 2012), processes and procedures (Ackoff, 1981), or methods (Ries, 2011). Yet, all of these theories and methods propose to determine which BM offers the best alternative to an existing or new BM and elaborate on the future viability of BM alternatives (Chesbrough, 2010; Heikkilä et al., 2018; Mitchell & Coles, 2004; Teece, 2010).

While there are multiple ways to organise the disparate theoretical background on BMI, it is constructive, in a first step, to contrast the differences between two broad methods that relate to the process of entrepreneurial BM design: *commitment* and *experimentation*.

Commitment presents a rather static perspective, which suggests that entrepreneurs commit to a theory and associated beliefs very early, and hence that they strongly commit to their original idea without any flexibility (Andries et al., 2013, pp. 296–302; Bocken & Snihur, 2020, p. 4). However, in recent years, both the practice of management and the scholarly debate has recognised that new ventures must make decisions about a business idea under conditions of growing uncertainty. New ventures often experience great difficulty in defining a viable BM due to high levels of technological and market uncertainty, the unpredictability of commercialisation options, and limited knowledge and resources to deal with these (Reymen et al., 2017, pp. 595–596). Hence, early commitment to unrealistic theories and beliefs can lead to big failures and entrepreneurs who commit to their original idea too early might be less successful than entrepreneurs who continuously update their BM (Bocken & Snihur, 2020; Martins et al., 2015). Recent work (e.g., Andries & Debackere, 2007) concludes that experimenting and redefining a BM is highly instrumental under these uncertain circumstances.

McGrath and MacMillan (1995) were among the first scholars who proposed a new set of methods to adapt to the conditions of high uncertainty in their book entitled “The entrepreneurial mindset: Strategies for continuously creating opportunity in an age of uncertainty”. These methods are grounded in a philosophy of incremental development rather than formulating long-term plans (Mansoori & Lackéus, 2019, pp. 793–794). The book by McGrath and MacMillan (2000) opened up a space for the development of novel scientific methods for entrepreneurial decision-making, such as experimentation.

Studies that are relating to *experimentation* acknowledge a dynamic perspective that sees BM development as a flexible process in which firms experiment, change, refine, and re-invent their BMs and do not rely on ex-ante commitments to a specific BM (Camuffo et al., 2020, p. 564). This perspective is based on incremental and adaptive cycles of experimentation, learning, and iteration (Blank, 2005; McGrath & MacMillan, 1995; Minniti & Bygrave, 2001; Ries, 2011), market feedback about early outlines of an idea (Thomke et al., 1998; Thomke, 2003), adaptations to environmental changes and resources, means, and objectives currently available (Sarasvathy, 2001). Several approaches in strategic management and economics emerged that try to capture these dynamic theories and methods, such as effectuation (Sarasvathy, 2001), business experimentation (Kerr et al., 2014), the lean start-up (Ries, 2011), trial-and-error learning (Sosna et al., 2010), and discovery-driven planning (McGrath, 2010; McGrath & MacMillan, 1995). All of them commonly address a commitment-free analysis that confronts entrepreneurs with several equally viable alternatives from which they must choose to design a BM. In line with this, Gans et al. (2019) assert that there is more than one path to gain and capture value from an idea, and thus the central challenge that entrepreneurs face is how to choose the right BM. These theories and methods, which seem to better fit decision-making under uncertainty than commitment does, are detailed in the following sub-chapters 2.2.2.1 and 2.2.2.2.

2.2.2.1 Theory of Effectuation, Causation, and Bricolage

In 2001, Sarasvathy proposed *effectuation* as a theory of entrepreneurial thinking and as a conceptualisation of how entrepreneurs behave in the early stages of developing their BM. According to this theory, entrepreneurs start with a given set of means or resources (what is found to be important and preferred to happen, what is known, and who is known) to attain new and different goals (Sarasvathy, 2001, p. 245). Hence, in effectuation entrepreneurs take a set of means as given and focus on selecting between possible effects that can be created with that set of means (e.g., developing a new and not yet specified product or BM). Effectuation addresses a logic of control (Sarasvathy 2001), thereby promoting the idea that entrepreneurs' tasks are not limited to uncovering latent opportunities patiently waiting to be discovered (Mansoori & Lackéus, 2019, p. 796). Effectuation involves the actual creation of opportunities that emerge out of interactions between a new venture and stakeholders over time (Dew et al., 2011, pp. 235–237). More precisely, effectuation promotes the idea that entrepreneurs collaborate with others and focus on partnerships to acquire resources and create a new market or sustain a new venture (Chetty et al., 2015, p. 1439).

Additionally, Sarasvathy (2001) explains the logic and dynamic nature of effectuation as an inverse of *causation*. Causation starts with a pre-determined desired goal through a specific set of given means or resources and seeks to identify the optimal, meaning the fastest, cheapest, or most efficient alternative to achieve this given goal by predicting the future (Sarasvathy, 2001, p. 245).

Sarasvathy (2001, p. 251) proposes different aspects to contrast the two logics: while causal reasoning focuses on predictable aspects of an uncertain future, effectuation focuses on the controllable aspects of an unpredictable future. Whereas causation aims to maximise the potential returns by selecting optimal strategies, effectuation introduces the concept of affordable loss by defining the level of loss and risk that is acceptable given a set of means. Effectuation thus focuses on experimenting with as many strategies as possible given the limited means. Furthermore, causation is better when knowledge or expertise of a specific new technology or industry pre-exist, while effectuation is more appropriate for exploiting contingencies that arise unexpectedly over time. Finally, causation suggests that entrepreneurs conduct a detailed competitive analysis, whereas effectuation logic emphasises the formation of strategic alliances to create barriers for entry (Sarasvathy, 2001, p. 251). Concluding, Fütterer

et al. (2018, p. 65) find that both concepts have most often been used to understand the effects of entrepreneurial behaviours in the start-up domain. However, given the often highly unpredictable and ambiguous environments in which new ventures operate, it is questionable whether planning approaches, such as causation, are suitable to deal with these uncertain conditions (Fisher, 2012, p. 1024). As an answer to this, Reymen et al. (2017, p. 604) offer empirical evidence confirming that effectuation is especially useful in the early phases of new venture development, whereas causation becomes increasingly important as the venture grows.

Another theory that has come to the fore next to causation and effectuation logic is the theory of entrepreneurial *bricolage*. Baker and Nelson (2005) appropriated the concept of bricolage from sociology and applied it to entrepreneurship. The authors provide a set of guiding principles that entrepreneurs should use, with a focus on circumstances in which entrepreneurs are confronted with resource constraints (Mansoori & Lackeus, 2019, pp. 793–794). The term bricolage is defined as “making do by applying combinations of resources at hand to new problems and opportunities” (Baker & Nelson, 2005, p. 333). In their research paper, Baker and Nelson (2005) describe how entrepreneurs use bricolage to invent new uses and novel combinations of their existing resources (McDonald & Eisenhardt, 2020, p. 486) and to identify and exploit opportunities (Fisher, 2012, p. 1020) to develop a new BM.

2.2.2.2 Methods of Learning and Experimentation

Experimentation

The method of experimentation was already implicitly touched on as part of effectuation and bricolage theory (Mansoori & Lackeus, 2019, pp. 793–794). Through experimentation, entrepreneurs actively try out a specific BM, thereby incorporating feedback from the environment and adopting an active stance to learning about the environment (Andries et al., 2013, p. 290). Murray and Tripsas (2004, p. 70) define purposeful experimentation as “firms’ [engagement] in clearly articulated problem-solving, based on the identification of a problem or decision, the establishment of a hypothesis, and the testing of that hypothesis through organisational activity”. According to this definition, experimentation encompasses four steps that entrepreneurs follow, namely 1) identifying a problem or decision, 2) building a hypothesis about the likely outcome, 3) acting to test the hypothesis, and 4) evaluating the results (Murray & Tripsas, 2004, p. 70). Experimentation aims to gather feedback prior to the completion of a product or BM development process, whereby an initial value proposition may evolve into a

viable BM (Nicholls-Nixon et al., 2000, p. 496). Through the process of experimentation, entrepreneurs learn lessons regarding what is required to make money on a sustainable basis, develop competencies and insights regarding sources of innovation, and become more strategic in their business operations (Morris et al., 2005, pp. 732–733). Bojovic et al. (2018, p. 142) confirm the learning role of experimentation, and also reveal two other roles of experimentation. The authors realise that experimentation can also play a role in signalling the value of a BM or good intentions to potential partners and customers, and in convincing other parties to engage in a relationship with a firm and try out the BM (Bojovic et al., 2018, p. 142).

Experimentation can take different forms in different contexts. In the software industry, firms experiment by circulating beta products, while in the hardware industry firms produce prototypes of early-stage products with basic features. In contrast, in research and academia, firms experiment by circulating working papers (Contigiani, 2019, p. 2) whereas, in business experimentation, business ideas are evaluated with real customers in the market through low-cost experiments to find out what types of customers are interested in a new service and how the value proposition needs to be formulated (Bocken & Snihur, 2020, p. 2). According to Bocken et al. (2019, p. 1505), business experimentation may also comprise low-cost practices such as interviewing experts, creating booklets to gather feedback, conducting ethnographic observations or creative sessions, and running brainstorming sessions.

Thomke et al. (1998, p. 316) provide an explicit example of experimentation by explaining how one might build a prototype of a new, more rapidly deploying airbag for a car and run an experiment to evaluate its actual deployment speed. If the results are satisfactory, the experiment stops, if the results are not satisfactory, one could modify the design or conditions of the experiment and iterate, i.e., try again. Such examples depict that experimentation can be physical in nature, such as by using prototypes, or be represented in other forms, such as computer simulations in digital form, and as virtual experiments (Thomke et al., 1998, p. 316).

Bojovic et al. (2018, pp. 142–143) subsume these forms of experimentation into two overarching forms: *purposeful interactions* and *experimental projects*. Purposeful interactions describe interactions with customers, partners, experts, and other external actors by having questions about a BM and testing one or more BM components derived from these questions. In experimental projects, a BM is manipulated and put through a real-life situational test, e.g., running pilot projects (Bojovic et al., 2018, pp. 142–143).

Contigiani (2019, p. 5) asserted that these forms of experimentation require two elements. First, experimentation requires the disclosure of an incomplete product or BM to others outside the company. Second, it requires that the experimentation process takes place before the market entry of a product or BM. Hampel et al. (2020, pp. 2–3) complement these two requirements by adding three distinct key characteristics of experimentation. First, the authors assert that experimenters must match the ideas of what the new product or BM will supply to customers with the likely demand of the customers. Second, the development of a new product or BM is driven by suspected customer needs and not by technical features. Third, experimental processes are conducted sequentially and iteratively to minimise the resource investments for developing prototypes or digital simulations (Hampel et al., 2020, pp. 2–3). If the outcomes of experimentation are negative, the BM is redefined and a new series of experiments must be started (Minniti & Bygrave, 2001, pp. 13–14) and thus experimentation stresses the central idea of learning by doing (Hoogma et al., 2002, pp. 5–6).

Overall, experimentation has been highlighted as a way to exploit opportunities and rapidly test a market or BM (Trimi & Berbegal-Mirabent, 2012, p. 452). It is employed to develop BM alternatives before committing additional investments to a business idea (McGrath, 2010, p. 259). At the same time, experimenting always implies at least partial strategic commitment to one plan over other equally viable alternatives, and commitment implies forgoing other options (Gans et al., 2019, p. 738). Despite this drawback, experimentation has become a widespread approach to generate and test hypotheses about novel BMs (e.g., Andries et al., 2013; Camuffo et al., 2020; McDonald & Eisenhardt, 2020). Kerr et al. (2014, p. 25) maintain that experimentation is fundamental to entrepreneurship, “because the knowledge required to be successful cannot be known in advance or deduced from some set of first principles” (Kerr et al., 2014, p. 25). Furthermore, experimentation helps managers to actively learn about their environment and to probe the future and new markets (e.g., Andries et al., 2013; Berends et al., 2016; Murray & Tripsas, 2004). Suitable experiments on the market can not only help to test the product acceptance by customers (Ries, 2011) but can also help to evaluate, e.g., sales performance or costs of a new product (Breuer, 2013, p. 14). To conclude, scholars agree that a high degree of uncertainty can only be effectively reduced through a process of active experimentation in order to convert assumptions into facts and make decisions grounded in reliable information gathered from carefully crafted experiments (Mansoori & Lackéus, 2019, pp. 793–794).

Discovery-driven planning and trial-and-error learning

Several methods such as discovery-driven planning and trial-and-error learning (e.g., Andries et al., 2013; Chesbrough, 2010; McGrath, 2010; Sosna et al., 2010) have been developed to assist in BM experimentation. Thomke et al. (1998, p. 316) explain that experimentation using trial-and-error problem-solving starts with selecting and creating possible solutions. Through a trial-and-error experiment, new information is provided that the experimenter was not able to know, foresee, or predict in advance—namely the error. Detecting and correcting errors during the experimental process thus generates learning (Sosna et al., 2010, p. 386) and the outcomes of the experiment can be used to revise and refine a solution or business idea (Thomke et al., 1998, p. 316).

Next to trial-and-error learning, McGrath (2010, pp. 258–259) emphasises discovery-driven planning to assist experimentation. In discovery-driven planning, one can conceptually experiment with a BM before any investment is required. Thus, entrepreneurs are required to not only test but to first articulate a plan/idea and how they think this plan/idea can be successful (McGrath, 2010, pp. 258–259). The BM is also benchmarked against competitive models and potential market demand. The first step in discovery-driven planning is to think about new BMs and try to model different units thereof. Hence, this process resembles the rapid prototyping in experimentation, as entrepreneurs can become familiar with a new BM and how it needs to be executed in advance before any investments are made (McGrath, 2010, pp. 258–259).

Thought experimentation and cognitive mechanisms

The aspect of articulating a BM before testing it (McGrath, 2010, pp. 258–259) has received very little attention in the literature at present in comparison to the actual experimenting by prototyping that is mainly brought into focus. The research shows that some scholars are concerned with thought experiments or cognitive mechanisms, besides the notion of experimenting in the real world (Baden-Fuller & Morgan, 2010, p. 164). Felin and Zenger (2009, pp. 127–146), in particular, regard entrepreneurs as theory developers, engaged in deliberate problem framing and solving along the process of BM selection and development.

To ensure an all-encompassing view of the modes of experimentation, it is essential to give a brief insight into the distinction between what Gavetti and Levinthal (2000, pp. 114–115) and Berends et al. (2016, p. 198) call *cognitive search* and *experiential learning*. Gavetti and Levinthal (2000, pp. 114–115) assert that cognition permits the assessment of alternatives in an

offline mode. In this conjuncture, actors evaluate alternatives based on their understanding of the world and the probable consequences of engaging in certain behaviours. In contrast, experiential learning processes are described as a synonym to the process of experimentation, due to their requirement for the partial implementation of a BM alternative in the real world to evaluate its efficacy. Experiential learning thus turns into an online evaluation mode. Gavetti and Levinthal (2000, pp. 114–115) explain that, at the extreme end of the spectrum, experiential learning processes imply that only one alternative can be explored at a time, whereas in contrast, an off-line cognitive process can invoke a broad set of alternative actions at the same time. Felin et al. (2020, p. 1) support the importance of cognition in the BMI process. They suggest that the most valuable entrepreneurial ideas demand carefully formulating the problem that a new venture seeks to solve, developing solutions on how to solve the problem, and then only crafting a set of potential experiments to explore these solutions. They made their point by arguing that “a well-composed theory elevates the nature and impact of experiments—enabling the composition of critical experiments, experiments that permit unique and clearer conclusions about a startup theory’s merits. Paradoxically, the end result may be faster pivots and, above all, more productive ones” (Felin et al., 2020, p. 1).

The Lean Start-up

Mansoori and Lackeus (2019, pp. 793–794) find that the overall methods of scholarly origin outlined above did not seem to diffuse extensively outside the realms of the academic world, while practitioner-grounded counterparts most often reached a wider audience. In this vein, the Lean Start-up (Ries, 2011) method started to gain momentum. In the Lean Start-up developed by Ries (2011), experiments are used to determine customer preferences by rapidly testing assumptions in real-life situations. As such, the idea is not new but is built on experimentation, which represents the basis for the Lean Start-up. Ghezzi and Cavallo (2020, p. 521) explain that in the Lean Start-up method, entrepreneurs translate their vision or business idea into falsifiable hypotheses that build a preliminary version of a BM. Afterwards, these hypotheses are tested through a series of minimum viable products, which are defined as “the smallest set of activities needed to disprove a hypothesis” (Eisenmann et al., 2012, p. 2). All key hypotheses are confirmed or validated by minimum viable product tests. Ghezzi and Cavallo (2020, p. 521) continue this based on the test outcomes, according to which entrepreneurs can either persevere with their BM, pivot their BM, or drop their BM. In this context, a pivot refers to a change of direction of a BM (Ries, 2011). Multiple stages of information gathering and pivoting may

follow, whereby the BM is revised and the process stops when the entrepreneur arrives at a final, validated version of the BM (Girotra & Netessine, 2014, pp. 100–101).

While some of the presented theories and methods appear similar at first glance, the variations in the details are often relatively large. As an example, Mansoori and Lackéus (2019, p. 808) explain that effectuation calls for entrepreneurs to cope with uncertainty by taking action with the aim to create the future, whereas in the Lean Start-up, entrepreneurs discover the future through testing carefully designed hypotheses.

In summary, this review on theories and methods for learning and experimentation highlighted that, while the experiential learning benefits of experimentation are largely undisputed, we still know comparatively little about cognition and thought experimentation in the BMI process. This concern is central to early-stage ventures, which may be particularly vulnerable to uncertainty and financial constraints. Experimentation, by definition, requires disclosure of an idea to the market, however, new ventures might have to work with premature ideas. As a result, experimentation in the form of testing does not seem to be the most efficient and effective way for new ventures to try out a business idea. Undeniably, more research is required to understand thought experimentation with novel and impactful BMs. Thus, the study of thought experimentation in the sense of articulating a BM before testing might be a good starting point for understanding experiential learning in the pre-seed phase of the BMI process. This also supports the need to minimise the paradox and risk of making the wrong choice for an actual experiment with a BM. Felin et al. (2020, p. 3) support this thought by arguing that, in many cases, it is unclear why market actors such as customers or partners would have a better sense of the viability of some future BM compared to entrepreneurs themselves.

Additionally, the review raised questions concerning the extent of the roles that various actors play in how a new venture's BM is developed. Due to a considerable need in the entrepreneurial pre-seed phase to access resources to develop a BM, and no existing organisational rules or procedurals to follow for making decisions, other actors' actions may be particularly salient as they could influence entrepreneurs' mental schemas and thoughts through their interactions.

2.2.3 Structured Process Models

A prerequisite for providing systematic guidance on BMI is to analyse the process through which companies innovate their BM (Frankenberger et al., 2013, p. 254). Hartley (2006, p. 38) stresses this point, and argue that “the articulation of processes helps to identify particular barriers and facilitators at particular stages, and this may be of practical help to policy-makers and managers”. Especially for new ventures, important characteristics of their BMs are shaped during the sensitive period of early founding (Chesbrough & Rosenbloom, 2002; Snihur & Zott, 2020). Thus, entrepreneurs not only have to address whether to proceed with a new business idea but also how to proceed with it.

This chapter is concerned with examining and delineating high-level process models that address the concrete steps of BMI. Several normative innovation process models have been developed that include all phases from analysis and ideation over development to implementation and commercialisation (Amit & Zott, 2012; Frankenberger et al., 2013; Wirtz, 2010). Even though innovations are much more complex and dynamic than what is represented in these normative models, they help to reduce reality’s complexity by abstraction and thereby derive activities and decision points (Bucherer et al., 2012, p. 185). Wirtz and Daiser (2018, p. 53) argue that normative process models help BMI initiatives to ensure that all decisions and deviations from established plans are based on a holistic process perspective that considers all possible steps in the BMI process.

Established phase models that emerged from innovation research (e.g., Beckman & Barry, 2007; Frohman, 1978) have shown how the systematic and structured nature of innovation processes is a key success factor for innovation initiatives (Müller-Roterberg, 2020, p. 63). In most early studies, the design and development process of product/service is the subject of research. Hence, many BMI phase models are based on a comparison of models from the product/service innovation literature and in-depth BM case studies (Zott & Amit, 2015, p. 403). However, the question still arises whether the process of BMI follows the same established process as for product/service innovations or whether modified process models are required (Müller-Roterberg, 2020, p. 63). Bucherer et al. (2012, pp. 190–191) indicate that there seem to be similarities between product/service innovations and BMIs. However, they also assert that BMIs can be based on changes of different core elements (value creation, delivery, and capture),

which is why there are significant deviations among the concrete activities performed in the innovation phases of BMI (Bucherer et al., 2012, pp. 190–191).

Established approaches to BMI often have a procedural structure that consists of individual phases, whereby each of the phases reflects a development step that is part of the BMI process (Wirtz & Thomas, 2014, p. 37). Although, Wirtz and Daiser (2018, p. 52) encounter differences concerning the orientation of proposed BMI approaches in the literature. While some focus on the design of BMs, others focus on their management and realisation. The models differ in the level of detail, content, and structure of their individual phases, and in the definition of their start and end dates (Mansfeld, 2011, pp. 17–18). Wirtz and Daiser (2018, p. 52) ascribe this finding as an indicator of the diverging definitions, views, and opinions of what BMI is in general. Furthermore, there are differences regarding the publication period, as the majority of early approaches were assumed to be linear, standardised, and well-structured (Frankenberger et al., 2013, p. 254). Due to the linear structure, firms only run through each process phase once. Most of these approaches comprise the four phases of analysis, design, implementation, and control (Schallmo, 2013, pp. 108–109). These linear process models were criticised by later studies that revealed that, in reality, innovations seldom happen in a linear sequence (e.g., Mason & Spring, 2011) but that they are iterative (Chesbrough, 2010) and characterised by discontinuities and feedback loops (Frankenberger et al., 2013). They incorporate a multidirectional character with a semi-structured flow of activities that need to be matched to specific requirements of each individual firm's BMI initiative (Wirtz & Daiser, 2018, p. 53), whereby, some phases may be passed through several times while others will not be covered at all in some BMI initiatives.

In general, it can be summarised that although the literature offers a large number of process models for the BMI concept, none of these has yet been able to establish itself as the prevailing model (Hauschildt & Salomo, 2007, p. 486). Thus, to enable improved reading guidance, the following sections of this chapter are discussed with the aid of two (rather similar) inputs from Wirtz and Thomas (2014) and Wirtz and Daiser (2018), who both conducted a literature review to create a generic process model. Both sets of authors provide a process step allocation of the most relevant process models to gain a generic BMI process. Their process is based, on the one hand, on the integrated BMI approach by Wirtz (2010) and, on the other hand, on the authors' own evaluations. Wirtz and Thomas (2014, pp. 44–46) and Wirtz and Daiser (2018, p. 51) both centralised the most relevant process models into seven generic process phases. While Wirtz

and Thomas (2014, pp. 37–44) analysed 26 different approaches in their analysis, Wirtz and Daiser (2018, pp. 42–50) identified 20 approaches that differ in content, procedure, and scope. Wirtz and Thomas (2014, pp. 37–44) further differentiated between three periods during which the different approaches were published, including the years 2000–2009, 2010, and 2011–2013. Furthermore, the authors observed the principle requirements before creating generic process models. On the one hand, they ensured that the process structure presented includes all relevant activities of BMI and, on the other hand, they ensured that their process-based approaches are suitable for start-ups and further development situations of BMs (Wirtz & Thomas, 2014, p. 44).

As a result, both of the literature reviews not only identify the same prevalent approaches, but they also both highlight seven similar generic process phases: analysis, ideation, feasibility, prototyping, decision-making, implementation, and monitoring/controlling or sustainability. Wirtz and Daiser (2018, p. 51) explain these seven generic phases, commencing with *analysis*, which refers to the key activity of analysing the current BM, product/services, customers, and the market or competition. In *ideation*, the BMI mission is determined, customer scenarios are developed, customer insights are generated, and the visions are formulated, whereas in *feasibility*, assumptions are made about the business environment and its interdependencies, and the potential internal and external BM alignments are analysed. *Prototyping* describes the creation and analysis of different BM alternatives, whereby several detailed concepts are developed and refined. Afterwards, in *decision-making*, the BMI design alternatives are evaluated and a final BMI design alternative is selected. The subsequent *implementation* phase refers to the development of an implementation plan, the team set-up, and the step-by-step realisation of the BMI. Finally, *sustainability* refers to the monitoring and controlling of BMI and its potential adaption to secure a long-term competitive advantage (Wirtz & Daiser, 2018, p. 51). This generic BMI process is illustrated in figure 5.

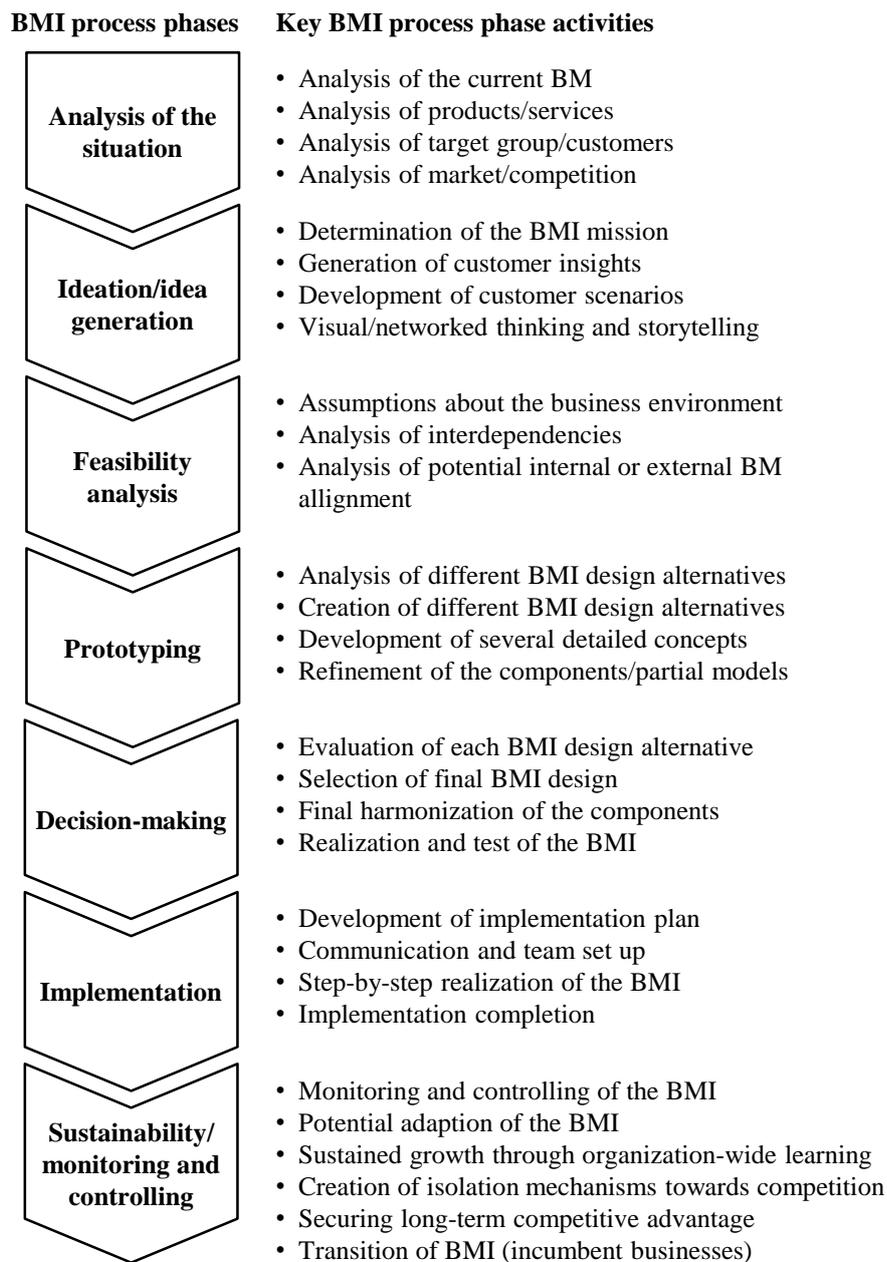


Figure 5: Generic business model innovation process

(based on Wirtz and Thomas (2014, p. 45) and Wirtz and Daiser (2018, p. 51))

Wirtz and Thomas (2014, pp. 34–44) conclude that in the course of the development of approaches to BMI, the number of phases and the complexity of the processes have increased with time. However, the authors determine a heterogeneous understanding and analysis of BMI in the 26 process models. The models that emerged in the early stages of development mostly contained three, or at most four phases while the number increased to up to 10 phases over time. In addition, the phases that have mostly been left out in descriptions are the initial situation,

decision-making, and the monitoring and controlling (Wirtz & Thomas, 2014, pp. 43–44). Moreover, the authors found that the first models available in the literature were formulated in rather general terms, in contrast to recent models that contain more specific phases (Wirtz & Thomas, 2014, pp. 43–44). In a further step, these differences are explained in more detail in relation to the most relevant process models, which were identified within the framework of this paper and complement the evaluations of the two literature reviews. For a simplified presentation, the individual process models and their similarities and differences are discussed along with the generic process phases by Wirtz and Thomas (2014) and Wirtz and Daiser (2018).

Among the first models with a processual structure is that by Linder and Cantrell (2000). In their model, the process of BMI consists of three phases. In the first phase, the current BM is described. In the second phase, the new BM is developed. The final phase comprises the implementation of the new BM. Other process models developed in the early stages point to a similar sequence. Pateli and Giaglis (2005, pp. 167–183), Chesbrough (2007, pp. 12–17), and Giesen et al. (2007, pp. 27–33) address the study of existing BMs in the first phase of the process. In contrast, Voelpel et al. (2004, pp. 259–276) and Johnson et al. (2008, pp. 51–59) do not explicitly address the existing BM but start with the actual process phase, which focuses on the development of the new BM. More recent literature summarises these first phases as the *analysis and initiation phases* (Amit & Zott, 2012; Frankenberger et al., 2013; Gassmann et al., 2013). In a more recent paper of Zott and Amit (2015, pp. 395–406), the authors refer to these two stages as *observe* and *synthesize*. The *observe* stage involves a close examination of the customers to develop a deep understanding of the customer experience (Zott & Amit, 2015, pp. 395–406). Similarly, Frankenberger et al. (2013, pp. 258–261) confirm the importance of observing the firm’s environment. They emphasise the firm’s activities that focus on the understanding and monitoring of a firm’s surrounding ecosystem (e.g., customers, competitors, suppliers) in the initiation phase. In a subsequent step, Zott and Amit (2015, pp. 395–406) introduce *synthesize*, which requires BM designers to take stock, share, and make sense of what they have learned during the observation stage. This involves the ordering of data, search patterns, recurring themes, and issues to build frameworks (Zott & Amit, 2015, pp. 395–406). Similarly, Geissdoerfer and Weerdmeester (2019, p. 14) use the wording of *concept design* when they address the analysis and initiation phases. In the concept design, the purpose of the BMI, the key stakeholders, and the BM’s value proposition are defined. Afterwards, a first

rough conceptualisation of the key elements of the proposed new BM is developed and documented (Geissdoerfer & Weerdmeester, 2019, p. 14).

The subsequent process phases, which are assigned to the areas of *feasibility*, *prototyping*, and *decision-making* are clearly more heterogeneous in their designs than the two phases presented previously. Pateli and Giaglis (2005, pp. 167–183) analyse the implementation of BMI in the context of technological influence, which, e.g., should be assessed to identify missing roles or functions. Voelpel et al. (2004, pp. 259–276) also confirm the importance of reconfiguring the business system infrastructure in the context of BMI. Johnson et al. (2008, pp. 51–59) consider the development of a particular value proposition, the creation of a profitability formula, and the identification of key resources and processes as the central core steps in these phases. Zott and Amit (2015, pp. 395–406) refer to the wording of *generate* and *refine*, which involves the creation of potential design solutions and the evaluation of these. Additionally, Chesbrough (2007), McGrath (2010), Osterwalder et al. (2010), Wirtz (2010), and Geissdoerfer and Weerdmeester (2019) suggest that the selection of a new BM should be preceded by an experimentation phase, which serves the purpose of designing, evaluating, and testing different BM options (Wirtz & Daiser, 2018, pp. 42–45). Similarly, Geissdoerfer and Weerdmeester (2019, p. 19) explicitly refer to experimenting as the testing of the key assumptions and variables of the BM concept in simulations and field experiments. This is followed by an in-depth analysis and detailing of all the elements of the new BM and the interactions between these elements. Finally, the entire BM concept is tested through piloting by running a first limited version of the BM in a target market (Geissdoerfer & Weerdmeester, 2019, p. 19).

The phases that were assigned to the areas of testing prototypes and making decisions are consistently followed by the *implementation* of the new BM or the change of the old BM. Before implementing a new BM, Johnson et al. (2008) compare the new BM to the current one in order to know which way to go. The only exception to this proposed approach is found in the work of Voelpel et al. (2004), who only address the early steps of the BMI process, wherefore the prototyping and implementation of a new BM is not part of their model. Finally, the last process phase, the *monitoring and controlling*, is neglected by most authors. Only Wirtz (2010) specifically deals with BM monitoring and controlling. In addition, Osterwalder et al. (2010) recognise approaches that enable the controlling of the BM after implementation. In particular, they address adjustments to the BM that may become necessary as a result of certain market reactions. The BMI processes of Mitchell and Coles (2004), Johnson and Lafley (2010),

Osterwalder et al. (2010), Sosna et al. (2010), Teece (2010), Wirtz (2010), and Geissdoerfer and Weerdmeester (2019) go beyond the implementation phase of the new BM as these approaches explicitly recommend post-implementation process steps.

The research approaches of the publications incorporated in this paper all show an exploratory research design, about half of which are conceptual and half of which are empirical. The empirical studies are primarily of a qualitative nature (interviews) or rely on case study approaches. The research approaches of the incorporated publications are summarised in table 7.

Table 7: Selected business model innovation process phases
(based on the generic process by Wirtz and Thomas (2014, p. 45) and Wirtz and Daiser (2018, p. 50))

Author(s)	Phases						
	Analysis	Ideation	Feasibility	Prototyping	Decision-making	Implementation	Sustainability/controlling
Amit and Zott (2012)	Analyse customer needs	BM content innovation, BM structure, government innovation	Checking value creation through novel BM	Defining revenue models	Launching model		
Chesbrough (2007)	BM analysis	Experiment for innovation	Choosing the best concept	Implementation			
Frankenberger et al. (2013)	Initiation (analysing the ecosystem)	Ideation (generating new ideas)	Integration (building a new BM)	Implementation (realisation)			
Gassmann et al. (2013)	Initiation (analysing your ecosystem)	Ideation (adapting patterns)	Integration (shaping your BM)	Implementation (realising your plans)			
Johnson and Lafley (2010)	Create a customer value proposition, design a profit formula	Identify key resources and processes	Compare proposed to current model, incubation	Acceleration, transition			
Lindner and Cantrell, 2000	Describe the actual BM	Develop a new BM	Change the BM				
Mitchell and Coles (2004)	Understand and optimally apply the current model	Ongoing design and testing of potential business improvements, replacements, and innovations	Understand and begin installing the next BM improvement or replacement				
Osterwalder et al. (2010)	Assembling all elements for new BM design	Research and analyse elements for BM design effort	Generate and test BM options and select the best	Implement the BM prototype	Adapt and modify the BM in response to market reaction		
Parthé and Ghaghl (2005)	Document current BM	Assess influence of technology innovation, identify missing roles, define scenarios	Describe the new BM, evaluate the impact of change				
Sosna et al. (2010)	Initial BM design and testing	BM development	Scaling up the refined BM, sustaining growth through organization-wide learning				
Voelpel et al. (2004)	Sensing potential for change in customer behaviour and new customer value propositions, sensing the strength, direction and impact of technology, sensing the potential for value system (re)configuration, including organisational structure(s)	Sensing the economic feasibility and profitability of the proposed BM					
Wirtz (2010)	Idea generation	Feasibility analysis	Prototyping	Decision-making	Monitoring and controlling		
Zott and Amit (2015)	Observe (examination of customers)	Synthesize (gain understanding of design challenges and influences)	Generate (creating a new BM)	Refine (evaluation of BM design solutions, rapid prototyping)	Implement (Selecting a specific BM design)		

In this paper, the generic BMI process by Wirtz and Thomas (2014, pp. 44–46) and Wirtz and Daiser (2018, p. 51) serve as a basis for further analysis, because it was developed to serve the context of start-ups and provides a summary of previous approaches, thereby ensuring that all relevant steps are included in the analysis. However, because this paper's studies only focus on the period of BMI birth, i.e., on the pre-seed phase of BMI in new ventures, only the first phases of the generic process model will be of relevance and thus the phases of implementation and controlling/monitoring are not of great significance for this paper's research questions.

2.2.4 Empirical Insights on the Antecedents and Outcomes

The impetus for a BMI and its consequences can be very diverse. A review of the antecedents, barriers, and effects of BMI reveals many factors that are divergent and placed at different levels. The literature highlights the fact that the influencing factors of BMI in incumbent firms and start-ups differ from each other. For example, Comberg et al. (2014, p. 2) emphasise that the level of influence of founders in start-ups might be higher than in established firms because, in the latter, the founders may only be involved as shareholders or may even have left the company entirely. The authors further indicate that start-ups may fail because they have simply chosen a wrong BM due to the circumstance that the founders have no experience in a market, while established firms might rather fail because of a crisis or market change (Comberg et al., 2014, p. 2). Thus, distinct research could be identified for BMI in both these contexts, i.e., established firms and start-ups.

In the following, the drivers and antecedents of BMI are discussed first. Similar to previous literature (Bucherer et al., 2012, p. 195; Demil & Lecocq, 2010, pp. 237–238), they will be divided into *internal* and *external triggers* of a firm. Afterwards, the effects achieved through BMI are discussed.

According to Foss and Saebi (2017a, p. 9), compared to the well-established literature on product, process, and service innovation, relatively little is empirically known about how BMs evolve and change. This paper's review supports this finding as it was shown that most of the literature is at times conceptual and only little empirical work is currently available. Foss and Saebi (2017a, p. 9) ascribe this lack of theorising on the dynamics of BMs to the predominantly static view that the literature has so far adopted towards BMs (e.g., Demil & Lecocq, 2010). As a result, research on the antecedents and triggers to BMI is still emerging. To close the gap

between the increasing importance of BMI in science and management and the limited conceptual and empirical knowledge, Wirtz and Daiser (2017, p. 25) identify and explore scattered BMI insights in a literature-based investigation and deduce them into an integrative framework. With this framework, the authors aim to provide conceptual assistance to researchers and practitioners. They find that existing BMI frameworks propose several possible influencing factors on BMI and sum them up into eight factors: globalisation, technology, industry and market shifts, regulatory and economic issues, changing customer needs, product/service innovations, competition, and firm dynamics (Wirtz & Daiser, 2017, p. 25). These and other factors are examined in more detail in the following sections, whereby the investigation follows the understanding of Heitmann et al. (2011, pp. 229–232) who explain that internal factors are those circumstances that a firm can directly influence and change. In contrast, external factors are external circumstances that influence the choice of a BM and which cannot be directly influenced by a firm. External factors refer to constraints caused by changes in the environment or external shocks that abruptly interrupt the usual functioning of a firm (Demil & Lecocq, 2010, pp. 237–238).

External antecedent factors

Referring to firms' external environment, previous studies have considered possible drivers of BMI in terms of broader environmental triggers. These exogenous drivers can spur BMI and can bring about changes in BMs. Reinhold et al. (2011, p. 71) state that across industries, changes in the business environment influence the sustainable competitiveness of BMs. Competitors and aggressive new entrants with new business logics, new technologies, or changes in the regulatory environment make it inevitable for established firms to rapidly recognise environmental changes and adapt their BM to new circumstances (Demil & Lecocq, 2010; Hamel, 2000; Johnson & Lafley, 2010; Zollenkop, 2006). In line with this, Demil and Lecocq (2010, pp. 227–246) conceptualise a framework to analyse the case of the English Premier League football club Arsenal FC. They show that firm sustainability and survival depends on anticipating and reacting to sequences of voluntary and emerging BM changes. Accordingly, firms need to retain their capability to build and sustain performance while changing their BMs. On a higher-order, the effects of increasing globalisation (Lee et al., 2012), digitisation of the business environment (Weill & Woerner, 2013), and technological developments such as Web 2.0 (Wirtz, 2010) have been identified as drivers of established firms (Schneider & Spieth, 2013, pp. 5–6). Battistella and Nonino (2012, p. 3) explain that

economic motivations in this context refer to all behaviours that lead to the direct or indirect economic advantage of a company (Battistella & Nonino, 2012, p. 3).

De Reuver et al. (2009) analyse the impact of external drivers on BM change and factors in organisational life-cycle theory in the form of different phases of service development in more detail. The authors conducted a cross-industry study of 45 enterprises in which they explored the external drivers of BMI and found that market-related and technological changes are the most prevalent drivers. Furthermore, they show that changes in the competitive environment drive BMI (de Reuver et al., 2009, pp. 278–284). Robertson (2017, pp. 93–94) conceptually studies the extant literature on BMI and asserts that BMI will be highest at intermediate levels of competitive intensity. Under monopolistic conditions or conditions with an excessive number of competitors, the available resources are reduced, and hence BMI does not seem interesting for both new and established firms.

Furthermore, technological change (Teece, 2018), opportunities through new information and communication technologies (Pateli & Giaglis, 2005; Sabatier et al., 2012; Wirtz, 2010), and technology shift (Comberg et al., 2014) can enable the design of innovative and completely new BMs, which provides opportunities to disrupt an existing industry or market (Bouwman et al., 2018). As an example, customers may change their behaviour in terms of how they play computer games, i.e., switch from social platforms on desktop devices to mobile devices (Comberg et al., 2014, p. 15). This change is initiated by new technologies (e.g., new technology devices). On the one hand, these new technologies may render existing products and services obsolete, while on the other hand, they provide possibilities for new products and services, and hence opportunities for new market entrants (Robertson, 2017, pp. 93–94). Relating to new ventures, Comberg et al. (2014, p. 11) assert that a firm's recognition of the need to obtain a sustainable BM in the long-term perspective influences BMI because a new venture that wants to grow must be sustainable. Thus, it is important to sustain scalability and the ability to win investors (Comberg et al., 2014, p. 11).

Recent research also points to the role of external stakeholders (Ferreira et al., 2013), and suggests that triggers for BMI can also come from very different stakeholder groups. Customers, suppliers, retailers, research institutes, universities, or consultants and service providers can be sources of BMI. These actors initiate the development process for a new BM with their ideas, problems, needs, wishes, or tasks (Müller-Roterberg, 2020, pp. 69–70). In this

connection, Robertson (2017, pp. 93–94) suggests that the structure and dynamics of the supplier and channel environment of a firm might open up opportunities for new BMs or necessitate changes in an established BM. In addition, changing customer behaviours in the form of changing preferences and demands (Comberg et al., 2014; Ferreira et al., 2013; Johnson et al., 2008; Markides, 2006) and the increased significance of the customer's voice via the ratings of products and services through social media (Weill & Woerner, 2013) have further influenced interest in BMI (Spieth & Schneider, 2016, p. 679). The requirement to satisfy customer needs does not differentiate between incumbent or new firms (Comberg et al., 2014, p. 3). In particular, literature on customers' willingness-to-pay and open innovation, which considers the customer as an important source of improvement and innovation, have driven the need to consider an increasing number of potential BM designs (Spieth & Schneider, 2016, p. 679).

Furthermore, the literature argues that legislative actors can set incentives through taxes and regulations by means of programmes to support technology-oriented firms, thereby creating better financing opportunities or giving new ventures an impulse to pivot (Heitmann et al., 2011, p. 235). Contrary to these suggestions, de Reuver et al. (2009, pp. 283–284) indicated that regulatory drivers only play a minor role in BMI. The results of Demil and Lecocq's (2010, pp. 236–237) single case study demonstrate that the external environment puts requirements on a BM, such as laws and regulations, that can either lead to a viable or an unviable BM. Their results partly support the findings of de Reuver et al. (2009).

Foss and Saebi (2017a, p. 9) conclude that different external drivers are likely to cause various changes in a BM, some of which may be proactive and some reactive in the face of external changes, and thereby result in different market or competitive outcomes. Moreover, Zott and Amit (2015, pp. 402–403) argue that working around external constraints is more likely to happen through BMI in new ventures rather than in established firms because incumbent firms are much more constrained internally by their extant BMs (Chesbrough & Rosenbloom, 2002), by leadership and managerial inertia (Chesbrough, 2010), and by their extant resources and capabilities (Bonaccorsi et al., 2006). Overall, the recapped developments have encouraged many firms to rethink and reshape the way they do business—that is, in which ways these firms organise changes and conduct activities with customers, vendors, partners, and other stakeholders across the firm and industry boundaries (Zott & Amit, 2015, p. 397).

Internal antecedent factors

Concerning internal antecedents of BMI, the work of Giesen et al. (2007) was one of the first to show that triggers and influences on BMs can be internal and not only external to a firm. However, they did not specify or name the factors, which result in the need for further research to identify specific internal triggers. Research that addresses this knowledge gap primarily considers individual and personnel factors and factors that take the dynamics between and within BM components into account.

First, individual motivations concern the psychological sphere of individuals and their reputation (Battistella & Nonino, 2012, p. 3). This involves individual-level cognition through creativity, mindfulness, or analogical reasoning (e.g., Amit & Zott, 2015; Martins et al., 2015). Battistella and Nonino (2012, p. 2) suggest that, in general, innovation processes are strongly based on committed people who have enthusiasm and self-motivation to implement an idea and are convinced by an external incentive. Witte (1973) already identified the innovator roles, and several studies deepened the analysis by identifying the personal traits and behaviours of individuals to determine their importance for the success of innovation processes. However, these findings only address innovations in general and do not refer to BMI and actor roles in BMI in particular.

Furthermore, personnel factors, which refer to the role of managers and founders in BMI, are regarded as internal triggers of BMI. Two business theories are important for identifying such personnel influencing factors. On the one hand, the founder theory, which claims that the person of the founder has a considerable influence on various aspects of a firm, and on the other hand, the upper echelon theory, which claims the same concerning the top management team (Heitmann et al., 2011, pp. 229–232). Accordingly, a crucial question is the effect of top management action and leadership on the design and alterations to the architecture of a BM (Foss & Saebi, 2017a, p. 9). This includes the outcomes of the top (or middle) managers' teleological decision-making processes (Demil & Lecocq, 2010, pp. 237–238). Concerning incumbent firms, Osiyevskyy and Dewald (2015, pp. 63–71) conducted an empirical study of the real estate brokerage industry. Their results show that both the situational (e.g., manager's perception of threat and opportunity) and dispositional factors (e.g., manager's prior risk attitudes and industry experience) determine the initial strategic decision to change a BM. Significantly, a manager's experience may not only positively influence BMI, but can also

make them more rigid in terms of decision making and, as a result, inhibit a firm's intention to strengthen its existing BM (Osiyevskyy & Dewald, 2015, pp. 63–71). In line with the predictions of prospect theory, the authors also show that a perceived performance-reducing threat has a significant positive effect on the explorative adoption of a BM.

Studies that point to the importance of founders in BMI (Snihur & Zott, 2020) argue that the BM evolves based on founders' perceptions of opportunities and is thus based on mental schemas, such as experimentation (Martins et al., 2015). These mental schemas were discussed in the previous chapter as part of the theoretical background. Comberg et al. (2014, p. 11) mention that in all their analysed cases, it could be shown that founders were one of the most important factors that influence the process of BM change. Founders were most often identified as the actors who take the initiative. To explain this observation, Comberg et al. (2014, p. 11) assume that founders are the ones who have an in-depth overview of the overall situation in and of a new venture, e.g., of the financial and personnel resources. Patzelt et al. (2008, p. 211) argue that founders possess valuable tacit knowledge about the original purpose of the new product or service, know its strengths and weaknesses, are aware of and know of ways to solve the problems that have occurred during its development or may occur in the future, and may know of options to improve the BM in the future. Furthermore, and in line with previous findings, Snihur and Zott (2020, pp. 34–35) highlight that founders' search behaviour, thinking style, and decision-making patterns shape a new venture's BM. The authors based their analysis on the results derived from an in-depth longitudinal multiple-case study. Consistent with the notion of the BM as an activity system (Zott & Amit, 2010), their research suggests that the systemic thinking of founders positively influences BMI. Moreover, they show that founders leverage ownership, expertise, and prestige to impact the novelty of a BM through centralised decision-making that enables BMI (Snihur & Zott, 2020, pp. 34–35). In another earlier qualitative study, Snihur and Zott (2014) analysed data from interviews and other secondary sources in eight firms and found that team-level effects are less noteworthy than was expected from the innovation literature and that team-level effects can even be associated with a lack of BMI (Snihur & Zott, 2014).

Further literature that is helpful for developing new insights into the internal antecedents of BMI includes research on dynamic capabilities (Achtenhagen et al., 2013; Teece et al., 1997). The ability to innovate a BM in response to major changes in the external environment or dynamics within or between core components of a BM is a key dynamic capability of a firm

(Demil & Lecocq, 2010, pp. 237–238). Business financials (profitability, revenues) and cash and financing (financing BM changes or the current BM) clearly are internal influencing factors. If a BM cannot capture value, i.e., the founders are not making money with a BM and customers are not willing to pay for a BM, an initial BM needs to be redesigned in a way that enables a new venture to make revenues, operate profitably, and survive in the long-term (Comberg et al., 2014, p. 14). Accordingly, financials may either be facilitating factors or have the potential to become barriers when compensations for realising changes of a BM are not received (Comberg et al., 2014, p. 13). Surprisingly, Comberg et al. (2014, p. 16) show that investors are not one of the key factors that influence BMI even though one might expect this due to their importance as being capital providers. However, investors are merely involved in changing BMs and initiating fundamental changes in operations. Hence, they only confirm BM changes, but certainly have nothing to do with operations themselves (Comberg et al., 2014, p. 16).

Barrier factors

Besides all the factors that explain how and why BMI evolves, the research also refers to multiple barriers that hinder the evolution and change of BMs. Brenk and Lüttgens (2015, p. 4) investigated a mid-sized German industrial equipment manufacturer in a longitudinal single case study. They detected five barriers to BMI for established firms: complexity, risk, politics and managerial power, organisational inertia, and leadership gap. Complexity is seen as a barrier because BMI is built on a very specific fit of a firm's core competencies, capabilities, resources, and its strategic alliances or collaborative partners (Bucherer, 2010). Risk refers to the associated risk of choosing the wrong BM. Due to its transformational impact on fundamental firm processes and strategies that demand very high costs and resource requirements, BMI is also referred to as an uncertain investment (Chesbrough, 2010; Osterwalder, 2004). Third, firm politics and managerial power can negatively impact BMI, because certain stakeholder groups (e.g., managers) might be cognitively committed to a firm's established BM and business logic (Chesbrough, 2010; Chesbrough & Rosenbloom, 2002). As a result, these stakeholders impede the exploitation of new market opportunities through BMI. Fourth, organisational inertia can be described by Hannan and Freeman's (1984) theory of organisational inertia. This theory refers to companies' limited ability to undertake structural changes in their business logic or BM as a response to market threats or opportunities. Finally, the leadership gap implies that no person in a firm has the necessary ability and the capabilities

to perform BMI. Brenk and Lüttgens (2015, p. 5) summarise the five barriers to BMI into three larger categories, namely will or general resistance, ability (knowledge, expertise, or skills), and bureaucratic and administrative barriers.

Outcome factors

Given the significant BMI drivers, antecedents, and barriers, it is also important to understand the performance consequences that BMI can generate. Thus, another stream of research that shall be discussed focuses on the outcomes of BMI—namely new or innovative BMs (Foss & Saebi, 2017b, p. 207). Similar to the drivers of BMI, empirical studies focusing on the effects of BMI are still rare. This lack of empirical research is attributed to the complexity of operationalising and measuring BMI, and to the time lag between BMI and performance outcomes (Foss & Saebi, 2017a, p. 9). Given this lack of empirical evidence, it is not even clear whether BMI is beneficial or harmful to a firm and how different types of BMI can result in different outcomes (Foss & Saebi, 2017a, p. 9).

Despite this, some benefits of BMI have been identified, such as effects on industry and market structures (Casadesus-Masanell & Zhu, 2010), effects on individual firm results, such as an increase in financial performance (Aspara et al., 2010), and effects on a firm's capabilities, such as the ability to strengthen a firm's strategic position (Gambardella & McGahan, 2010), and its power to attract new customers (Kim & Mauborgne, 2005). Referring to the effects on industry and market structures, Sabatier et al. (2012) discuss the impact of BMIs on dominant industry logics. Based on analysing the changes that biotechnologies and bioinformatics bring to the drug industry, they show that it is BM renewal at the firm level that drives industry evolution. Alliances between entrepreneurial new entrants and external actors appear to be a key break-point in the disruption of the previous dominant logic (Sabatier et al., 2012, p. 29). Hence, a firm must reinvent its BM to disrupt an industry's logic, which assumes that BM evolution is progressive (Sabatier et al., 2012, p. 29). This result is in line with the previous results of Sosna et al. (2010). Meanwhile, Casadesus-Masanell and Zhu (2010) conducted game-theoretic experiments to analyse competitive reactions to a market player's BMI. They show that the optimal response to a new rival often entails BM reconfigurations.

Another group of effects comprises impacts on firm results. Firms that are capable of taking advantage of broader environmental changes and circumstances by innovating their BM (Casadesus-Masanell & Zhu, 2010, p. 195) will perhaps be able to achieve higher growth rates

(Spieth & Schneider, 2016, p. 679). Empirical studies were able to support the hypothesis that BMIs have a positive influence on the economic success of firms and prove that BMIs are superior to product or service innovations, as they have greater sustainable competitive advantages and stronger financial ratios (e.g., Aspara et al., 2010; Teece, 2010). One of the first of these empirical studies was conducted by Mitchell and Coles (2003). Over a period of 10 years, Mitchell and Coles (2003, p. 18) annually identified the 100 public companies above a minimum size whose stock prices had grown the fastest. The authors asked the CEOs of these companies what they felt accounted for their success and what they planned to use to extend that success. Afterwards, they observed what worked and what did not to sustain successful growth. As a result, Mitchell and Coles (2003, p. 18) could show that BMI helps a firm become more successful. First, they explain that BMI can outweigh established advantages and size, and second, being opposed by competitors who continue with BMI without upgrading a firm's own BM is a prescription for competitive disaster. Alongside this research, Cucculelli and Bettinelli (2015) examined the factors that affect firm performance in a sample of 376 small- and medium-sized Italian enterprises over a period of 10 years. They found that firms that modified their BMs over time experienced a positive effect on venture performance in an innovative way (Cucculelli & Bettinelli, 2015, p. 330). The Boston Consulting Group postulates in a study that BMIs are four times more successful than product or service innovations (Lindgardt et al., 2013, p. 3).

In addition, the positive influence of BMI on a firm's strategic flexibility, which reflects its ability to adapt to changing conditions, has been empirically proven (e.g., Bock et al., 2012; Schneider & Spieth, 2013). The empirical studies of George and Bock (2010) and Bock et al. (2012) examined the impact of BMI on a firm's strategic flexibility. Using a global, multi-industry data set of structured interviews with CEOs of 556 firms including 107 BM innovators, Bock et al. (2012) reveal senior management perceptions of the antecedents of strategic flexibility. They show that a firm's effort in BMI positively moderates the relationship between activity reconfiguration and strategic flexibility, thereby enhancing firm performance. Further studies also highlight the social effects of BMI, e.g., building inter-organisational networks with the consequence of creating new types of BMs (Bonakdar, 2015, p. 716).

In conclusion, the empirical insights identify many influencing and outcome factors that are different in nature and placed at different levels. In this context, studies also point to the role of external stakeholders (Ferreira et al., 2013), which suggests that triggers for BMI can also come

from different actor groups. Sources of BMI can be customers, suppliers, retailers, research institutes, universities, managers, investors, and, primarily, the founders of a new venture themselves. These actors initiate the development process for a new BM with their ideas, problems, needs, wishes, or tasks (Müller-Roterberg, 2020, pp. 69–70). Thus, previous studies clearly show that multiple actors influence the whole process of BMI, which is central to this paper's research questions.

3 Foundation on Engagement and Actor Roles

The third chapter of this paper is divided into two main sub-chapters. The first part is dedicated to the theoretical foundations of research on engagement. First, the concept of customer engagement is concretised, and the central theoretical explanations are discussed, which serve as a theoretical foundation for the research approach. Subsequently, the current state of research on actor engagement with a focus on engagement in networks is presented. Following this, the theoretical foundations that build the foundation for engagement research are identified. Afterwards, an overview is given of the antecedents and outcomes of engagement.

In the second part, the actor roles and role theory are presented. First, the theoretical explanations of the concept of role and role theory are explained. This is followed by an overview of the current state of research on role concepts regarding roles in innovation research.

3.1 Engagement

Engagement is an emerging phenomenon that has its roots in social psychology (Kahn, 1990), organisational studies (Schaufeli et al., 2002), and implicit theories held by practitioners (Brodie et al., 2011). In the marketing and service literature, academic research on engagement emerged around the years 2009 and 2010. This paved the way for the concept to gain momentum as a key research priority in the Marketing Science Institute in 2010, which resulted in a rapid increase in the number of publications directed towards conceptualising and measuring the customer engagement occurring in dyadic relationships between customers and firms or brands (Brodie et al., 2019, p. 174). Understanding strategies to drive lasting customer engagement remains a priority in the most recent publication (Marketing Science Institute, 2018). This prolific interest in the concept and the burgeoning of related literature has brought with it a high level of aggregation, including a variety of definitions and conceptualisations (Harmeling et al., 2017). Scrutiny of the literature suggests the emergence of several context-specific terms such as customer engagement (Brodie et al., 2011), customer engagement behaviours (van Doorn et al., 2010), consumer engagement (Hollebeek et al., 2019), brand engagement (Hollebeek, 2011), advertising engagement (Phillips & McQuarrie, 2010), actor engagement (Storbacka et al., 2016), offline and online engagement (Calder et al., 2016;

Hollebeek et al., 2016), reviewer engagement (Mosteller & Mathwick, 2014), and social media engagement behaviour (Dolan et al., 2016).

These complementary and overlapping concepts focus on the interconnected nature of market actors (Aarikka-Stenroos & Jaakkola, 2012). They address the enhanced roles of customers and users who participate in content creation, product development (Hoyer et al., 2010), and promote products, services and/or brands (Libai et al., 2010). This leads to the view that the roles of the customer and seller are becoming increasingly blurred (Vargo & Lusch, 2011). While research has tended to focus on customer engagement as a dyadic concept between a customer and a firm or brand (Brodie et al., 2011; van Doorn et al., 2010), more recent studies have increasingly addressed actor engagement such as engagement between partners (Breidbach et al., 2014; Jaakkola & Alexander, 2014), engagement among actors embedded in service ecosystems (Hollebeek et al., 2016; Storbacka et al., 2016), collective engagement (Kleinaltenkamp et al., 2019), multi-actor engagement (Li et al., 2017), and engagement in networks (Verleye et al., 2014). These perspectives accommodate new categories of actors and other empirical settings (Jonas et al., 2018). Contemporary thinking also suggests that engagement explicates the complex blurring of the roles that actors adopt in the open innovation, customisation, and innovation ecosystem literature (Alexander et al., 2018). Summarising these findings, Brodie et al. (2019) differentiate between two key streams of engagement research, the first being customer engagement and the second stream being labelled as emerging actor engagement research. The following two overarching sub-chapters adopt this division. Sub-chapter 3.1.1 thus provides deeper insights into the terminology of customer engagement before actor engagement beyond the dyad is discussed.

3.1.1 Terminology

3.1.1.1 Definition of Customer Engagement

Despite the increasing number of contributions on the subject, the concept of engagement lacks a clear definition in the marketing and services literature (Breidbach et al., 2014). Early conceptualisations of the concept viewed customer engagement as behavioural manifestations towards a firm or brand (van Doorn et al., 2010) or progressed to consider customer engagement as a multidimensional concept reflecting a customer's psychological state (Brodie et al., 2011).

Gradually, several perspectives have matured and shaped the theoretical understanding of engagement. Four primary streams of conceptualisations have emerged:

- *Engagement as behavioural manifestation*
Engagement is assessed as behavioural manifestations of interactivity that go beyond transactions, such as observable activities to engage (e.g., helping other actors, referrals, feedback) (van Doorn et al., 2010)
- *Engagement as disposition/psychological state*
Engagement is assessed as a disposition or psychological state, including a cognitive or emotional response, such as the tendency to engage (Brodie et al., 2011)
- *Combinative approaches on engagement*
Combinative approaches feature the disposition to engage as well as the act of engaging in an interactive process of resource integration (Kleinaltenkamp et al., 2019; Storbacka et al., 2016)
- *Process type model on engagement*
Engagement as several stages of customer decision making, adopting a process type model (Verleye et al., 2014) that focuses on the interactive process occurring between the focal actor and the focal object (Brodie et al., 2011). The focal object hereby pertains to the primary object(s) that the focal actor engages with (e.g., the customers, firms), while the focal actor reflects the primary subject who engages with the focal object(s) (Ng et al., 2020).

Before discussing these perspectives in more detail, it is helpful to understand the etymological origins of the term. The verb *to engage* implies to do or take part in something and to give attention to something (Merriam-Webster, n.d.). The adjective *engaged* means to be involved in an activity (Merriam-Webster, n.d.). Engaging as an adjective can be described as something being attractive or interesting (Merriam-Webster, n.d.). Hence, Finsterwalder (2018, p. 277) explains that *to engage* relates to activity and represents the multidimensional perspective on engagement, thereby encompassing engagement as a psychological state (Brodie et al., 2011) and behaviour (Brodie et al., 2011; van Doorn et al., 2010). The authors mention that *to be engaged* relates to being receptive to someone or something which stimulates a cognitive or emotional response and, as such, creates a psychological state. Finally, *engaging* sits in the

middle and relates to the stimulus, which can be an actor and/or a resource (Finsterwalder, 2018, p. 277).

The emergence of different perspectives on engagement has resulted in many different definitions of the concept. In their systemic review, Ng et al. (2020) identify 15 explicit definitions which have been cited in highly ranked papers or have been highly cited (> 100 citations). This collection of definitions is consistent with the overview of definitions that were identified for this paper. An overview of the definitions of customer engagement is provided in table 8. This overview only summarises the definitions of customer engagement and excludes those definitions of engagement that go beyond the role of the customer (e.g., actor engagement).

Table 8: Selected definitions of customer engagement

Author(s)	Definition
Bowden (2009, p. 65)	“The term engagement is conceptualised in this paper as a psychological process that models the underlying mechanisms by which customer loyalty forms for new customers of a service brand as well as the mechanisms by which loyalty may be maintained for repeat purchase customers of a service brand.”
Brodie et al. (2011, p. 260)	“Customer engagement is a psychological state that occurs by virtue of interactive, cocreative customer experiences with a focal agent/object (e.g., a brand) in focal service relationships.”
Harmeling et al. (2017, p. 316)	“We therefore define customer engagement as a customer’s voluntary resource contribution to a firm’s marketing function, going beyond financial patronage.”
Jaakkola and Alexander (2014, p. 248)	“We study [customer engagement behaviours] through which customers make voluntary resource contributions that have a brand or firm focus but go beyond what is fundamental to transactions, occur in interactions between the focal object and/or other actors, and result from motivational drivers.”
Kumar et al. (2010, p. 297)	“Active interactions of a customer with a firm, with prospects and with other customers, whether they are transactional or nontransactional in nature, can be defined as ‘Customer Engagement.’”
Pansari and Kumar (2017)	“We define customer engagement as the mechanics of a customer’s value addition to the firm, either through direct or/and indirect contribution.”
van Doorn et al. (2010, p. 253)	“Customer engagement behaviours are defined as the customers’ behavioral manifestation toward a brand or firm, beyond [a] purchase, resulting from motivational drivers”.
Verleye et al. (2014, p. 68)	“We define [customer engagement behaviours] as behavioral manifestations of customer engagement toward a firm, after and beyond purchase.”
Vivek et al. (2012)	“We define customer engagement as the intensity of an individual’s participation in and connection with an organisation’s offerings and/or organisational activities, which either the customer or the organisation initiate.”

Engagement as a behavioural manifestation

Ng et al.'s (2020) examination of definitions shows that customer engagement has predominantly been examined from a behavioural perspective. Engagement behaviours reflect the actors' resource contributions (e.g., time, energy, and effort) that are focused on interactions with the engagement object (Hollebeek et al., 2016, p. 393)—such as writing reviews or providing word-of-mouth recommendations. It is important to note that the prevailing literature views engagement behaviour as voluntary resource contributions that go beyond the core transactions, meaning that they go beyond the purchase or servicing process and what is fundamental to a relationship (Harmeling et al., 2017; Jaakkola & Alexander, 2014; van Doorn et al., 2010). In essence, customers are driven exogenously by their own unique purposes and intentions (Jaakkola & Alexander, 2014, p. 248).

The idea of voluntary resource contributions raises the question concerning the meaning of voluntary behaviours (Storbacka, 2019). The term *voluntary* can describe something that proceeds from the will or from the individual's own choice or consent, done by design or intention, or provided or supported by voluntary action without payment. Nonetheless, it has to be noted that all engaged actors are embedded in “interrelated sets of institutions that together constitute a relatively coherent assemblage that facilitates coordination of activity” (Vargo & Lusch, 2016, p. 18), meaning rules, norms, and practices.

Consistent with this view on customer engagement behaviour through a voluntary lens, Jaakkola and Alexander (2014) suggest that customers, both directly and indirectly, affect organisations by providing resources such as money, time, actions, and effort. The authors identified four types of behaviours, namely augmenting and co-developing behaviours (e.g., suggesting product improvements, identifying sources of innovation for firms), and influencing and mobilising behaviours (e.g., word-of-mouth, making social contacts aware of products):

- *Augmenting behaviour*

Augmenting behaviour describes how customers contribute resources such as knowledge, skills, labour, and time that directly augment the focal firm's offering.

- *Co-developing behaviour*

Co-developing behaviour describes how customers contribute knowledge, skills, and time, to facilitate the focal firm's development of its offering.

- *Influencing behaviour*

Influencing behaviour refers to the contribution of resources to affect other actors' perceptions, preferences, or knowledge regarding the focal firm.

- *Mobilising behaviour*

Mobilising behaviour refers to customers who contribute resources such as relationships and time to mobilise other stakeholders' actions towards the focal firm.

Thus, customers' actions can augment the offering of a firm through involvement in co-developing activities (Prior & Marcos-Cuevas, 2016) or, alternatively, customers may direct their actions toward influencing other actors' attitudes or even mobilising them to take direct action concerning a firm (Jaakkola & Alexander, 2014).

Engagement as a psychological state

When conceptualising engagement as a psychological state, it becomes a multidimensional construct comprising behavioural, cognitive, and emotional engagement components. Brodie et al. (2011, p. 260) were the first to describe engagement as a multidimensional construct by defining it as “a psychological state that occurs by virtue of interactive, co-creative customer experiences with a focal agent/object (e.g., a brand) in focal service relationships”. Cognitive engagement reflects the degree of interest an actor has in interacting with an engagement object (Brodie et al., 2011; Vivek et al., 2014). Emotional engagement relates to the feelings, enthusiasm, and dedication invoked by the engagement object (Breidbach et al., 2014). Some authors also include a fourth dimension—social (Hollebeek et al., 2019; Vivek et al., 2014)—which involves the processes of networking and the search for long-term relationships (Ferguson et al., 2016; Vivek et al., 2012). Social engagement also involves social capital that is played out in terms of trust and commitment (Anderson & Hardwick, 2017; Brodie et al., 2013), so that customer engagement can be understood in terms of social capital or a conceptual equivalent thereof (Hardwick & Anderson, 2019, p. 44).

Hence, while behaviour is a critical manifestation of engagement, it also requires recognition of it as being a multidimensional construct that additionally induces cognitive, emotional, and social components (Carvalho & Fernandes, 2018; Heinonen, 2018). However, it is through behaviours that engagement affects other actors (Jaakkola & Alexander, 2014; van Doorn et al., 2010). Across both of the concepts (unidimensional/behavioural and multidimensional), it is commonly suggested that customer engagement requires an interactive experience between

a focal engagement subject (or actor) and a focal engagement object (or resource) (Hollebeek et al., 2019; Jaakkola & Alexander, 2014).

Engagement as a psychological state is underpinned by five fundamental propositions (FP) (Brodie et al., 2011) that have subsequently been revised (Hollebeek et al., 2016). The propositions grasp engagement as a psychological state that occurs within a dynamic, iterative process, encapsulating the cognitive, emotional and behavioural engagement dimensions. They also emphasize the central role of engagement within a nomological network of service-based conceptual relationships, and state that engagement is occurring within specific contextual conditions (Alexander et al., 2018, p. 335). Brodie et al. (2011) use these five propositions to develop their definition of engagement as a psychological state, with the aim to distinguish the concept from relational concepts, such as involvement or participation. Furthermore, the authors purposed to develop a framework for future research and to refine the conceptual domain of customer engagement (Brodie et al., 2011). A detailed overview of the FPs is provided in table 9.

Table 9: Revised fundamental propositions of customer engagement (based on Hollebeek (2019, p. 90))

	FPs of customer engagement	Revised FPs of customer engagement
FP1	Customer engagement reflects a psychological state, which occurs by virtue of interactive customer experiences with a focal agent/object within specific services relationships.	Customer engagement reflects a customer’s motivationally driven, volitional investment of specific operant and operand resources into brand interactions in service systems.
FP2	Customer engagement states occur within a dynamic, iterative process of service relationships that cocreates value.	The customer engagement benefits of customer individual and interpersonal operant resource development and cocreation result from customer engagement within service systems.
FP3	Customer engagement plays a central role within a nomological network of service relationships.	The customer engagement foundational processes of customer resource integration, knowledge sharing, and learning represent either necessary (i.e., for customer resource integration), or conductive (i.e., for customer knowledge sharing/learning) factors for the development of customer engagement in service systems.
FP4	Customer engagement is a multidimensional concept subject to a context- and/or stakeholder-specific expression of relevant cognitive, emotional, and behavioural dimensions.	Customer engagement reflects a customer’s investment of focal cognitive, emotional, behavioural and social resources during, or related to, specific brand interactions in service systems.
FP5	Customer engagement occurs within a specific set of situations generating differing customer engagement levels.	Customer engagement is contingent on focal context-specific characteristics in service systems. Customer manifestations (including intensity, valence) of customer engagement, the customer engagement foundational processes, and customer engagement benefits may thus vary across contextual contingencies.

Combinative approaches

The third stream on conceptualising engagement combines the approaches discussed above that feature engagement as a psychological state or rather the disposition to engage and the behavioural act of engaging in an interactive process of resource integration (Kleinaltenkamp et al., 2019; Storbacka et al., 2016). This stream rather refers to a disposition than a psychological state, because an engagement disposition constitutes an internal state of willingness and readiness or a tendency to act (Fehrer et al., 2018, p. 445; Storbacka et al., 2016, p. 3012). The disposition then implicitly leads to an activity of engaging (Fehrer et al., 2018, p. 446). Thus, engagement is represented by both the disposition to engage and the activity of engaging in an interactive process of resource contribution (Ng et al., 2020, p. 237).

Engagement as process type model

In addition to the recognition of unidimensional, multidimensional, or combinative approaches as identified above, a number of researchers conceptualise engagement as several stages of customer decision making (Ng et al., 2020, p. 237). These authors adopt a process type model that does not restrict engagement to one particular concept or stage but focuses on the interactive process including a range of interactions and experiences that occur between the focal actor and the focal object (Maslowska et al., 2016; Verleye et al., 2014).

However, no single conceptualisation and definition of engagement has matured to date and hence all four approaches on conceptualising engagement should be recognised and understood. In contrast to the definitional approach of customer engagement, Harmeling et al. (2017) posed the question of how firms can strategically guide customer engagement to benefit the firm's performance. The authors present a theory of customer engagement marketing that provides a foundation for how to use customer engagement to achieve marketing objectives. Thus, Harmeling et al. (2017) recognise that the term *engagement* may also refer to firm strategies construed as activities initiated by the organisation. The authors identify four separate but interrelated valuable types of customer-owned resources that companies can harness to achieve successful engagement marketing. These resources include network assets, persuasion capital, knowledge stores, and creativity. Network assets refer to the number, diversity, and structure of interpersonal ties in a customer's social network. Persuasion capital captures the degree of trust, goodwill, and influence a customer has with other existing or potential customers. Knowledge stores represent a customer's accumulated knowledge about a product, firm, and

other customers. Creativity includes a customer's production, conceptualisation, or development of novel and useful ideas, processes, or solutions to problems. These four types of customer-owned resources are tangible and intangible assets that firms can use to implement their strategies (Barney & Arikan, 2006) and accomplish their goals (Kozlenkova et al., 2014).

Gaining this general overview of the different approaches and perspectives on customer engagement is necessary to distinguish the conceptual distinctiveness of customer engagement from other relational concepts. Many concepts such as coproduction, participation, and involvement are close to and yet distinct from customer engagement behaviour.

Coproduction refers to the degree to which customers are involved in producing an offering for themselves (Bendapudi & Leone, 2003, p. 26). Similarly, customer participation behaviours refer to service exchange activities that are integrated (Dong & Sivakumar, 2017, p. 945) to benefit the customers (Bendapudi & Leone, 2003, p. 25). Coproduction and participation are both directly linked to the core transaction, and thus typically focus on customer actions that are elementary to the service transaction (Dong & Sivakumar, 2017, pp. 948–949). In contrast, customer engagement is associated with a voluntary, extra-role behaviour that goes beyond the core transaction and has an interactive character (Brodie et al., 2011, p. 258). Extra-role behaviours are commonly characterised by activities of customers that are (un-)beneficial towards a firm/brand and/or other customers rather than activities of customers' self-interest (Ahearne et al., 2005; Dong & Sivakumar, 2017; van Doorn et al., 2010).

Furthermore, Brodie et al. (2011) note that engagement is embedded within a broader network of service relationships in which other relational concepts, such as involvement and participation, represent specific customer engagement antecedents and/or consequences. Customer engagement extends beyond involvement in that it encompasses proactive interactive experiences with an engagement object, which are neither reflected by involvement nor by participation (Brodie et al., 2011, p. 257). Moreover, defining customer engagement as behaviours beyond the core transaction also has the benefit of distinguishing the concept from behavioural loyalty (i.e., repeat purchases) (Harmeling et al., 2017, p. 314).

3.1.1.2 Definition of Actor Engagement

The theoretical foundations on customer engagement showed that early engagement research almost exclusively focused on dyadic interactions between customers (subject) and a firm (focal object) (Brodie & Hollebeek, 2011; van Doorn et al., 2010; Verhoef et al., 2010). Emerging research has highlighted the shortcomings of this dyadic firm-customer perspective (Brodie et al., 2019), as it does not apply to engagement in complex multi-actor (business) contexts (Kumar & Pansari, 2016; Li et al., 2017), collective engagement (Kleinaltenkamp et al., 2019), engagement in networks (Verleye et al., 2014), or contemporary business environments, such as the collaborative economy (Bredibach & Brodie, 2017). Recent developments offer a broader theoretical view based on the concept of *actor engagement*, defined as “both the disposition of actors to engage and the activity of engaging in an interactive process of resource integration within the institutional context provided by a service ecosystem” (Storbacka et al., 2016, p. 3009).

The discussion on actor engagement highlights the need to specify the meaning of actors. Storbacka et al. (2016) clarified that the term *actor* “is commonly used in social sciences to depict humans or collections of humans, such as organisations”—who are typically categorised according to their discrete roles and functions (Lusch & Vargo, 2014b, p. 102). In this context, it is not clear if the construct of the actor refers to an individual or an organisation, such as governmental or non-governmental organisations, or technologies (Storbacka et al., 2016).

However, the literature on engagement acknowledges that engagement occurs among different types of versatile actors (Brodie et al., 2019, p. 177). These studies focus on a variety of actors, including employees (Kumar & Pansari, 2016), citizens (Bowden et al., 2016), or even nonhuman actors, such as machines (Storbacka et al., 2016) and their engagement within service ecosystems (Alexander et al., 2018). This service ecosystem perspective on engagement is drawn from service-dominant logic, principally the notion of institutions and institutional arrangements, and from the closely aligned structuration theory (Alexander et al., 2018; Vargo & Lusch, 2016). Lusch and Vargo (2014b, p. 161) define a service ecosystem as a “relatively self-contained, self-adjusting system of resource-integrating actors connected by shared institutional arrangements and mutual value creation through service exchange”. Referring to this definition, Alexander et al. (2018, pp. 337–338) construed that studying engagement in service ecosystems is subject to the principle that ecosystems are multi-level in nature,

comprising a micro-, meso-, macro-, and meta-level of aggregation. The authors explain the four levels by first introducing the micro view on engagement, which illuminates the dyadic relationship between an individual actor and an engagement object. The meso view introduces the immediate context surrounding an engagement object. On a broader level, the macro view extends the meso view by illuminating engagement as occurring in broader ecosystems that incorporate networked actors. The meta-level ultimately goes beyond the macro view by including multiple co-existing ecosystems, such as sectors or industries. Thus, micro-level interactions give rise to a meso system that creates a broader macro-level structure (Lusch & Vargo, 2014b). This highlights a multi-level perspective of actor engagement within and between multiple interrelated networks. For the purpose of this paper, the focus will only be on the engagement of individual actors with an engagement object, although the analysis is still subject to the assumption that engagement occurs within larger network structures in which the engaged actors interact with each other.

Actor engagement in association with the service ecosystem perspective also reveals a change, not only from the understanding of what constitutes the subject of engagement (actor) but also what constitutes the object of engagement. The engagement object may also include other customers (Hollebeek et al., 2019), employees (Kumar & Pansari, 2016), or a brand community (Dessart et al., 2015). Consequently, depending on the context, a BM may also be the object of engagement. Taking these observations into account, Blasco-Arcas et al. (2020, p. 74) make a concise résumé that “firstly, the object of engagement encompasses multiple actors beyond firms alone; [and] secondly, engagement contexts may include multiple objects”.

The fact that the stream of actor engagement literature is fragmented has resulted in numerous definitions and conceptualisations according to different contexts, similar to what is already the case for the literature on customer engagement. Depending on the context, conceptualisations comprise general definitions on actor engagement (Brodie et al., 2019, p. 174; Storbacka, 2019, p. 6), actor engagement behaviour (Alexander et al., 2018, p. 336), collective engagement (Kleinaltenkamp et al., 2019, p. 12), partner engagement (Reinartz & Berkmann, 2018, p. 251), or stakeholder engagement (Jonas et al., 2018, p. 402). An overview of recent definitions of engagement concepts is provided in table 10.

Table 10: Selected definitions of engagement concepts

Author(s)	Definition
Alexander et al. (2018, p. 336)	“This paper offers a broad definition of actor engagement behaviour as ‘an actor’s voluntary resource contributions that focus on the engagement object, go beyond what is elementary to the exchange, and occur in interactions with a focal object and/or other actors.’”
Brodie et al. (2019, p. 183)	“[A] General definition of actor engagement that we consider applies [sic] across contexts: actor engagement is a dynamic and iterative process, reflecting actors’ dispositions to invest resources in their interactions with other connected actors in a service system.”
Jonas et al. (2018, p. 402)	“Stakeholder engagement is defined here as a psychological state that occurs by virtue of stakeholder experiences throughout an interactive process within a specific service ecosystem.”
Kleinaltenkamp et al. (2019, p. 12)	“This notion of collective engagement refers to multiple actors’ shared cognitive, emotional, and behavioral dispositions, as manifested in their interactive efforts devoted to a focal object.”
Reinartz and Berkmann (2018, p. 251)	“We consequently define partner engagement as a partner’s volitional behavior towards any other stakeholder in the value chain affecting the focal firm’s business, including both direct (purchase-related) but mainly indirect (referral, influence, knowledge) behaviors.”
Storbacka (2019, p. 6)	“We define actor engagement as an actor’s (humans or machines) or a group of actors’ (collectives or organisations) exchange-based and non-exchange-based resource contributions, that are facilitated by dispositions, formed partly by actor specific characteristics and partly by the institutional and organisational arrangements prevalent in the context in which the resource contributions occur.”

As with customer engagement, the definitions of actor engagement show that the term is either examined from a behavioural perspective or conceptualised as the disposition to engage and the behaviour of engaging in an interactive process (Brodie et al., 2019). Research that focuses on the behavioural dimension of engagement points to the direct impact of individual actors’ engagement on their surrounding service system (Jaakkola & Alexander, 2014). Kleinaltenkamp et al. (2019, p. 14) point out the dynamic nature of actor engagement in that it affects resource integration processes between (1) the focal actor and the focal resource (e.g., the focal actor might invest time and effort in the focal object) (Brodie et al., 2013), (2) the focal actor and other actors in the service ecosystem, whereby both the focal actor and other individual actors may influence one another through positive and motivated behaviours (Jaakkola & Alexander, 2014), and (3) other actors and the focal resource, e.g., by influencing the opinions and activities of other actors of a community, the engaged actors affect the resource integration between those other actors and the focal resource (Alexander & Jaakkola, 2016).

Furthermore, the four categories to classify customer engagement behaviours by Jaakkola and Alexander (2014, p. 9) that were highlighted in the preceding chapter are also applicable to the broader context of actor engagement (Alexander et al., 2018). These four types of customer

engagement behaviours were summarised as customers' actions that can augment the offering of a firm through involvement in co-developing activities (Prior & Marcos-Cuevas, 2016) or, alternatively, customers' direct actions toward influencing other actors' attitudes or even mobilising them to take direct action concerning a firm (Blasco-Arcas et al., 2020, p. 75; Jaakkola & Alexander, 2014, p. 256). Transferred to the context of the actor engagement, augmenting and codeveloping behaviours indicate that an actor may directly contribute to a focal object, and influence other actors' attitudes or behaviours towards the object through influencing and mobilising behaviours (Alexander et al., 2018, p. 337). It is important to note that actor engagement can be positively (e.g., positive word-of-mouth) or negatively valenced (e.g., negative word-of-mouth and boycotting) towards the engagement object or other actors in the service ecosystem (Hollebeek & Chen, 2014).

Brodie et al. (2019) also developed the conceptualisation of customer engagement from that of a psychological state (or disposition) to one that includes a general actor-to-actor perspective. The authors apply the conceptualisation of the five fundamental propositions that underpin engagement as a psychological state (Brodie et al., 2011) or disposition, to a broader network perspective of actor engagement. They provide a comprehensive discussion of all five propositions and adapt them to actor engagement as illustrated in table 11.

Table 11: Fundamental propositions of actor engagement (based on Brodie et al. (2019, p. 184))

FPs for actor engagement	
FP1	Actor engagement dispositions occur through connections with other actors that lead to resource contributions beyond what is elementary to the transactional exchange.
FP2	Actor engagement emerges through a dynamic, iterative process, where its antecedents and consequences affect actors' disposition and network connections.
FP3	Actor engagement is a multi-dimensional concept, subject to the interplay of dispositions, and/or behaviours and the level of connectedness among actors.
FP4	Actor engagement occurs within a specific set of institutional contexts, generating differing actor engagement intensities and valence over time.
FP5	Actor engagement is coordinated through shared practices that occur on engagement platforms.

Moreover, Brodie et al. (2019, pp. 177–178) illustrate the development of engagement research from the dyadic to a multi-level perspective by reflecting the interplay between the various levels of aggregation (micro, meso, macro). As an example, the authors explain that firms engage with other firms and/or entrepreneurs in innovation networks. On a lower level of aggregation, these firms consist of various engaged employees who interact with their customers. Besides engaging in an innovation network, the entrepreneurs might also engage in an entrepreneurial network, working with other entrepreneurs, public policy makers,

volunteers, and customers (Brodie et al., 2019). Through these structures, networks are interconnected, and individual actors are engaged in several networks. This is similar to what Kleinaltenkamp et al. (2019) denote as collective engagement.

In line with Alexander et al. (2018), this paper follows the definition of actor engagement as an “actor’s voluntary resource contributions that focus on the engagement object, go beyond what is elementary to the exchange, and occur in interactions with a focal object and/or other actors” (Alexander et al., 2018, p. 336). This follows the argument that it is through engagement behaviours that engagement affects other actors (Jaakkola & Alexander, 2014; van Doorn et al., 2010).

3.1.2 Theoretical Background

Multiple theories were highlighted to build the foundation for research on engagement, with the core theories being the service-dominant logic and value co-creation, relationship marketing, and the stakeholder theory. Other theories that were pointed out include the social exchange theory, resource exchange theory, role theory, social capital theory, or social network theory. In their literature review, Ng et al. (2020, p. 238) provide an overview of the key theoretical lenses of engagement research. In line with their review, the most meaningful of these theoretical approaches are introduced and discussed against the background of the research questions. This is necessary because only with a sound understanding of actor engagement from these perspectives can the concept be meaningfully applied to the context of BM design in new ventures.

First, the service-dominant logic and its related concept of value co-creation are explained. Subsequently, the resource-based view and the approaches based thereon, that are emerging in parallel to the service-dominant logic, are presented. These remarks highlight the different resources, competences, and capabilities that actors can integrate into a process and through which they display different behaviours. Finally, complementary literature branches are discussed, which assist in the subsequent conceptualisation of actor engagement to understand individual components of actors’ behaviours in more detail.

3.1.2.1 Service-dominant Logic and Value Co-creation

With the service-dominant logic, the authors Vargo and Lusch (2004) raise a much-discussed perspective in the international marketing literature on the roles of companies, customers, and other market-related actors concerning the creation of value for different actors. Vargo and Lusch (2004, p. 1) explain that, due to the emergence of sub-disciplines such as relationship marketing, quality management, and services marketing, the previous goods-dominant logic is no longer sufficient to encompass all these sub-disciplines in a meaningful way. Goods-dominant logic centres on goods as the primary unit of exchange, with the customer as the recipient and value being determined by the producer. The goal of the service-dominant logic is to leave the goods-dominant logic behind and view market activities and actors from a new perspective that can adequately depict and classify the developments in marketing. In this way, service-dominant logic reconceptualises some basic terms and distinguishes them from goods-dominant logic, whereby service-dominant logic is based on 11 fundamental premises, eight of which appeared in the original article by Vargo and Lusch (2004), with others being added in 2008 (Vargo & Lusch, 2008a) and later combined into axioms (Vargo & Lusch, 2004, 2008a, 2016). In a first step, the meaning of the *service* concept is redefined and expanded to include service in the sense of an intangible resource. Service-dominant logic does not define service as a unit of output (goods) as traditionally employed by the goods-dominant logic; rather, it defines service as a process with the application of competences (knowledge and skills) for the benefit of another (Vargo & Lusch, 2008a, p. 256). In addition, the concepts of *exchange*, *resources*, and *value* are also newly defined (Vargo & Lusch, 2004, 2008b).

The service-dominant logic is fundamentally based on the premise that all actors in a complex system (e.g., business firms, non-profit and governmental organisations, individuals, and households) mutually depend on and benefit from each other's capabilities, skills, and resources (Taillard et al., 2016; Vargo & Lusch, 2011). This idea is grounded on the early adaptation of Vargo and Lusch (2011, p. 181) who recognised the need to see all social and economic actors as resource integrators, and hence to extend beyond the traditional roles of the customer and producer. All actors in a system are referred to as generic actors who interact with one another in resource integration processes and service-for-service exchange to co-create value (Lusch & Vargo, 2014a, p. 10). Vargo and Lusch (2004, p. 7) describe this kind of value as value-in-use or value-in-exchange, i.e., value which is created through the integration of resources of actors

involved in its use. From this perspective, all actors integrate resources in a joint value co-creation process and in this way engage with one another (Ng et al., 2020, p. 240).

This already highlights a central aspect of service-dominant logic, namely the reconceptualisation of the creation of value (Vargo & Lusch, 2008a, p. 256). Extant literature on service-dominant logic treats value creation as co-creation in that it recognises it as a process in which all actors are considered to be co-creators of value (Grönroos & Voima, 2013, p. 135). Grönroos and Gummerus (2014, p. 209) describe co-creation as the process of “creating something together in a process of direct interactions between two or more actors, where the actors’ processes merge into one collaborative, dialogical process”. Conduit and Chen (2017, p. 714) bridge co-creation and engagement and summarise that both share a conceptual fit on interactive experiences, iterative processes, and resulting mutual beneficial outcomes (Brodie et al., 2011; Grönroos & Voima, 2013; Vargo & Lusch, 2016).

Subsequently, Wilden et al. (2017) find that the most significant shift in research on service-dominant logic is centred on the notion of service ecosystems. Service-dominant logic supports a shift from dyadic relationships to a broader actor-to-actor system perspective encompassing any activity of actors who are engaging in interactive resource integration processes (Alexander et al., 2018). Consequently, value co-creation can be applied to the context of actor engagement, not only from a dyadic perspective but also from a network or ecosystem perspective. Thus, actor engagement and service-dominant logic share a significant theoretical focus on the interactivity with or between individuals (e.g., customers, employees) (Hollebeek et al., 2019, p. 162), or groups of individuals, such as organisations (Vargo & Lusch, 2008b).

3.1.2.2 Resource-based View and Resource-exchange Theory

Engagement research leans on a second notable research tradition that focuses on resources and competencies. Engagement research features the act of engaging in an interactive process of resource integration (Kleinaltenkamp et al., 2019), and thus engagement behaviour reflects actors’ resource contributions toward an engagement object (Hollebeek et al., 2016). It is thus necessary to distinguish between different resources, competences, and capabilities that assist in the subsequent conceptualisation of actor engagement to understand individual components of actors’ behaviours.

Barney's (1991) article "Firm resources and sustained competitive advantage" is widely cited as a pivotal work in the emergence of the resource-based view. From the resource-based perspective, each firm has a specific combination of resources that distinguishes it from any other firm (Wernerfelt, 1995). This bundle of resources can be interpreted as the material or tangible and the immaterial or intangible assets of a firm (Gouthier & Schmid, 2003, p. 120). Resources can generate a competitive advantage when organisations have a mix of valuable, rare, imperfectly imitable, and non-substitutable resources that are organised to capture value from (Barney, 1991). According to Madhok and Tallman (1998), firms are dependent on external resources rather than having all the needed resources and capabilities themselves and hence the underlying assumption in the process of new venture creation is that multiple actors engage and share their resources to design a new BM. The assumption of Madhok and Tallman (1998) thus aligns with the assumptions presented in this paper, which are both based on multiple actors and their resources.

Very early versions of the resource-based view identified two categories of resources, namely physical capital (e.g., tangible assets such as facilities, equipment, land, raw materials) and human capital (e.g., skills) (Penrose, 1959). Later versions also included organisational and financial capital (Barney, 1995). Based on this, various classifications of resources have been established. One of the first of these classifications is Foa and Foa's (1976) resource-exchange theory, which captures the importance of resources in shaping lifestyle and interpersonal relationships. The authors state that the core tenet of the resource-exchange theory is that actors exchange six distinct types of resources: love, status, information, money, goods, and services. This theory has also been used to understand different motives of exchange or to track resource exchange patterns within groups (Adams, 1965; Foa, 1971).

In their fundamental work on the service-dominant logic, Vargo and Lusch (2004) observed two kinds of resources—operant and operand resources—through which value is created. The authors define *operand resources* as "resources on which an operation or act is performed to produce an effect" (Vargo & Lusch, 2004, p. 2). These resources are typically material resources such as raw materials (Day et al., 2004, p. 22). On the other hand, Vargo and Lusch (2004, p. 6) highlight the fact that "the application of specialised skills and knowledge is the fundamental unit of exchange". This indicates that *operant resources* are a combination of skills, knowledge, and competencies, with the help of which an actor is able to change operand resources (Day et al., 2004, p. 22). They are defined as "resources that are capable of acting on

other (potential) resources to create benefit; they are often intangible and dynamic” (Lusch & Vargo, 2014c, p. 57). Building on this, Arnould et al. (2006) further details operant resources into physical, social, and cultural resources, and that of operand resources as economic resources, which consist of material objects or physical space.

Barney (1991) classifies resources into physical capital, human capital, and organisational capital. Extending the work of Barney (1991), Madhavaram and Hunt (2008) build on the resource-advantage theory and propose a hierarchy of basic, composite, and interconnected operant resources. The authors also provide a more finely grained view that classifies operant and operand resources into seven categories, namely financial (e.g., cash resources and access to financial markets), physical (e.g., raw materials such as plant and equipment), legal (e.g., trademarks and licenses), human (e.g., skills and knowledge of individuals), organisational (e.g., competences, controls, policies, and culture), informational (e.g., knowledge from consumer and competitive intelligence), and relational (e.g., relationships with suppliers and customers). Another classification of resources is presented by research that addresses resource interfaces. Cantù et al. (2012, p. 140) provide an overview of such research and state that resources can be classified into four categories, namely products, production facilities (e.g., equipment and facilities used to create or transform products), organisational units (e.g., organisational structure, competence, and personnel skills), and business relationships (e.g., links, ties and bonds resulting from interaction among businesses).

The resource-based view was followed by other theoretical concepts such as the competence-based view, the knowledge-based view, the capability-based view, and subsequently, the dynamic capabilities approach. The starting point of these approaches is that resources are complemented by capabilities and competences (Borgmann, 2012).

The competence-based view is mainly informed by Prahalad and Hamel (1990) who direct the focus of the competence-based view on the organisation-specific and person-bound competencies with which companies can successfully realise the use of resources (Borgmann, 2012, p. 89). Another development of the resource-based view is the capability-based view according to Müller-Stewens and Lechner (2005). This approach specifically focuses on the capabilities in a firm that serve to profitably use or transform resources. In this way, the capability-based view is also said to dynamise the static concept of the resource-based view (Müller-Stewens & Lechner, 2005) and thus forms an essential foundation for the concept of

the dynamic capabilities approach. Dynamic capabilities are defined as “the firm’s ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments” (Teece et al., 1997, p. 516). Hence, the dynamic capabilities approach aims to effectively organise the technological, organisational and managerial processes inside a firm (Teece et al., 1997, p. 509). Subsequently, the knowledge-based view was defined by Müller-Stewens and Lechner (2005), by considering the findings of the capability-based view for the resource *knowledge*. The knowledge-based view emphasises knowledge creation and social interaction between tacit and explicit knowledge (Nonaka, 1994).

Building on these explanations, Madhavaram and Hunt (2008, p. 67) explain that the terms *competences* and *capabilities* are interchangeable, because of their similar conceptualisations. As the terms can be equated, they may both be defined as “socially complex, interconnected combinations of tangible basic resources (e.g., specific machinery, computer software and hardware) and intangible basic resources (e.g., specific organisational policies and procedures and skills, knowledge, and experience) that fit together coherently in a synergistic manner to enable firms to produce efficiently and/or effectively valued market offerings” (Hunt, 2000, p. 188).

3.1.2.3 Social Networking Theory

The emergence of actor engagement in this paper can further be explained by the social networking theory, which describes the importance of interpersonal networks and social ties between individuals (Tsai & Ghoshal, 1998, p. 473). Social networking theory views social relationships in terms of nodes and ties, whereby nodes are the individual actors within the networks, and ties are the relationships between these actors (Caniëls & Romijn, 2008, p. 614). Corresponding research investigates the structure of the relations between social actors and how patterns in these relations influence a variety of outcomes, opportunities, and constraints (e.g., social and economic benefits) (Stuart & Sorenson, 2005, p. 233). Relationships that lead to successful outcomes are referred to as social capital, which is a key component of entrepreneurial networks (Burt, 1992). Social capital is also understood as the fourth dimension—social (Hollebeek et al., 2019; Vivek et al., 2014)—or as a conceptual equivalent of engagement (Hardwick & Anderson, 2019, p. 44), which also involves networking and the search for relationships (Ferguson et al., 2016; Vivek et al., 2012). Regarding new ventures,

social capital can directly impact them, e.g., by providing access to information, emotional support, legitimacy, or competitive capabilities (Yao, 2011, p. 1).

Barnes (1954) was the first researcher to use the concept of a (social) network. He studied the personal ties that link elements together in the formal structure of a village. Later, Scott (1991) summarised three lines of research that contribute to the social networking theory's development. These are the sociometric analysis tradition, which relies on graph theory methods from mathematics, the interpersonal relations tradition, which focuses on the formation of cliques among a group of individuals, and an anthropology tradition, which explores the structure of community relations in less developed societies (Liu et al., 2017, p. 2).

Social networking theory has proven valuable in the analysis of relationships between suppliers and customers in small- and medium firms' co-creation for innovation (Hardwick et al., 2013). Closely linked, the theory does offer some explanatory leverage for processes of engagement, since the components of interaction and resource integration fit well with social networking. From this perspective, social networking theory can help to explain actor engagement behaviour in building and developing social and organisational relationships and ties, because the interactions between entrepreneurs and other actors such as public institutions are mostly formed through their engagement in networking activities (Alexander et al., 2018; Verleye et al., 2014). The fundamental tenet of social networking theory that actors bring in resources accounts for the voluntary resource contributions that reflect the notion of actor engagement as a behaviour. Actor engagement provides an opportunity to build social exchange relationships that are not only based on tangible resources such as money, goods, and services, but also on intangible resources such as information and knowledge. In this vein, social networking theory extends the resource-based view by offering a relational view in which engagement appears within dyadic and network relationships.

3.1.3 Empirical Insights on the Antecedents and Outcomes

As highlighted in the previous chapters, many researchers discussed why actors, primarily customers, engage in behaviours beyond those that are assigned to their original or primary tasks (e.g., a customer engages in behaviours beyond those of a buyer or user). While the rapidly growing body of literature on engagement provides a good basis to empirically study the concept (Jonas et al., 2018, p. 412), only a few empirical investigations of the phenomenon

have been provided to date. Brodie et al. (2019, p. 183) find that engagement research has commonly focused on empirically exploring and measuring its antecedents, outcomes, and dynamics, and thereby mainly refers to customer engagement. The authors suggest that the empirical research currently informing the customer engagement realm can also be used to guide the development of actor engagement and further shape and verify its conceptual domain, including its antecedents and outcomes (Brodie et al., 2019, p. 185). Following this call for more research on engagement, recent studies started to investigate the antecedents and consequences of actor and stakeholder engagement.

Antecedents to engagement are primarily divided into customer-, firm-, and context-related antecedents (van Doorn et al., 2010, p. 256) or internal and external antecedents (Battistella & Nonino, 2012, p. 3). The same applies to the outcomes, which are divided into outcomes from the customer and the company's perspectives (Jaakkola & Alexander, 2014, p. 249). This clearly depicts the many variations in the approaches to the concept's antecedents and outcomes. In order to shed light on the underlying relationships of engagement, the following sections provide a review of the relevant literature that concurrently focuses on the antecedents and outcomes of engagement, both in customer and other actor-specific contexts.

Early studies on engagement relationships propose frameworks of the concept's antecedents and consequences, although all studies were conceptual (Bowden, 2009; Hollebeek, 2011; van Doorn et al., 2010). Bowden (2009, p. 65) developed one of the first conceptual models relating to engagement as a psychological process. The process model aims to elucidate the underlying mechanisms of engagement for customers of a service brand. Bowden's model considers engagement as varying for new customers who progress towards loyalty, and repeat customers who progress towards repeat purchases. Interestingly, while she suggests that all customers' progress relies on satisfaction, she assumes that new customers also strongly rely on calculated commitment while repeat customers rely on trust and affective commitment.

Subsequently, Bowden (2009) and van Doorn et al. (2010) proposed a rather broad framework showing customer-, firm-, and context-based antecedents of engagement that, taken together, lead to a certain customer engagement behaviour which results in customer-, firm-, and other consequences. Similar to the model of Bowden (2009), customer-based drivers include satisfaction, trust, and commitment although van Doorn et al.'s (2010, pp. 256–257) framework is much broader in scope and also proposes that identity, consumer goals, resources, and

perceived costs and benefits trigger engagement behaviour. Additionally, firm-based drivers, such as brand characteristics or firm reputation, and context-based drivers, such as competitive factors, are listed. In comparison to Bowden's (2009) model, this framework's proposed consequences are not as specific, especially concerning the customer's perspective, as it only names the dimensions of engagement (e.g., emotional, cognitive) and physical, time, and identity. From the firm's perspective, van Doorn et al. (2010, pp. 257–258) suggest that engagement has consequences for a firm's financial, reputational, regulatory, competitive, employee, and product side.

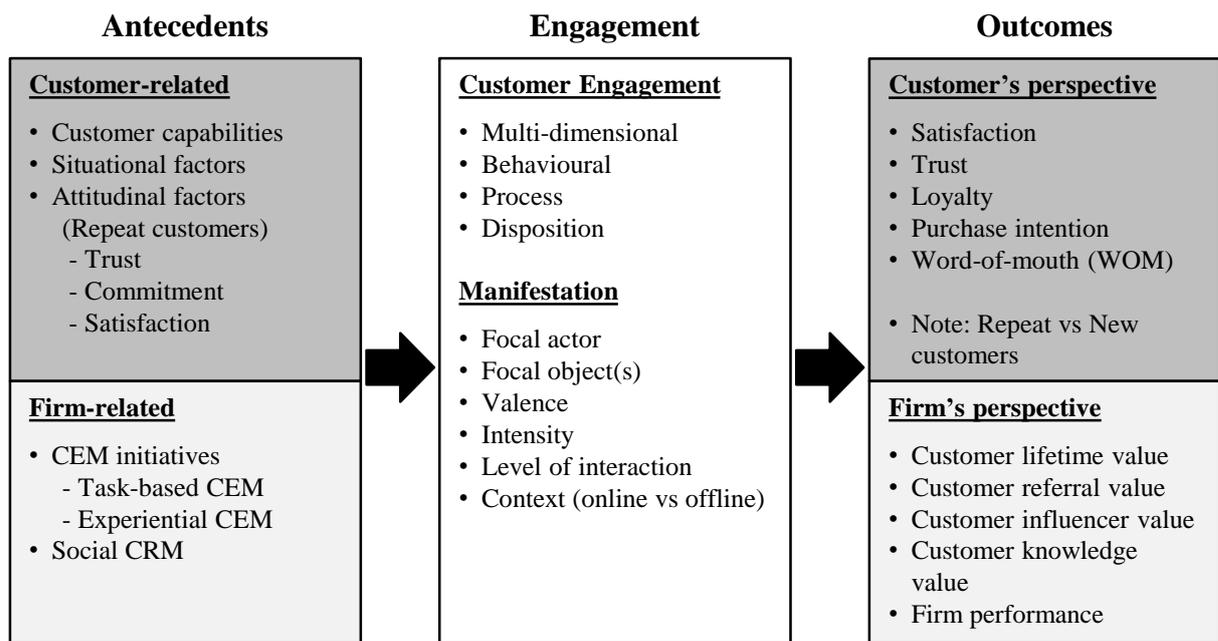
In line with the models of Bowden (2009) and van Doorn et al. (2010), Hollebeek (2011) attempts to position customer brand engagement in a network of nomological relationships, although this work was still conceptual. Hollebeek's (2011, p. 796) model proposes involvement as the only antecedent of customer brand engagement. Furthermore, the model proposes that engagement impacts customers' loyalty, mediated by trust, commitment, and satisfaction. Another interesting take from Hollebeek's (2011) study is the author's realisation that trust, commitment, and satisfaction might also be antecedents of customer engagement. Despite their differences, the three models of Bowden (2009), van Doorn et al. (2010), and Hollebeek (2011) show some recurring links between engagement and other factors. The relationships that have been explored most extensively are those linking engagement with trust, commitment, satisfaction, involvement, and loyalty. However, it is unclear whether these factors are antecedents or consequences of engagement or both.

One of the first explorative studies reporting a qualitative case study in the context of online brand communities was published by Brodie et al. (2013). The results show a process model of engagement, including customer engagement sub-processes. Following up on the earlier conceptual models described previously, Brodie et al. (2013, p. 110) determine loyalty, satisfaction, trust, and commitment as outcomes of engagement, which are supplemented by further factors that include empowerment, connection, and emotional bonds. However, the model only depicts the outcomes of engagement, while the triggers initiating engagement are not clearly named. Furthermore, the study of Brodie et al. (2013) demonstrates that the antecedents and outcomes of engagement behaviours are cyclical because positive outcomes for the actors can intensify both the actors' internal dispositions and their external connections to other actors (Brodie et al., 2019, p. 181).

Jaakkola and Alexander (2014, pp. 248–249) compiled further antecedents that were explored in empirical studies in online contexts, showing what motivates customers to engage in nontransactional behaviour. Accordingly, customers are shown to be intrinsically motivated because they expect benefits such as enhanced knowledge and reputation or social and economic benefits such as cost savings (Füller, 2010; Nambisan & Baron, 2009). Firms can also extrinsically motivate customers by providing platforms for information exchange and interaction (Baron & Warnaby, 2011; Dholakia et al., 2009) or by distributing rewards (Füller, 2010; Kumar et al., 2010). For the firm, engaged customers can denote benefits (e.g., sales growth, superior competitive advantage, and profitability) (Bijmolt et al., 2010; Kumar & Pansari, 2016), but can also yield negative consequences (e.g., unfavourable word-of-mouth) (Brodie et al., 2011).

Building on the previous papers, Fehrer et al. (2018) empirically tested the iterative nature of the engagement process through multiple experiments over time. They found support for loyalty as a predictor for high customer engagement behaviour and confirmed the iterative relationship of engagement and loyalty. In contrast, satisfaction and involvement, which were also tested as antecedents, did not significantly influence engagement behaviour and thus contradicted previous findings and the early conceptual models that proposed engagement relationships. Moreover, in alignment with the cross-sectional studies of Gummerus et al. (2012) and Dwivedi (2015), Fehrer et al.'s (2018) findings confirm satisfaction, involvement, and loyalty as consequences of customer engagement behaviour.

Most recently, Ng et al. (2020) provided a systemic review of customer engagement and identified commonly associated antecedent and outcome factors. Following Vivek et al. (2012), their review findings suggest two types of antecedents, namely customer-related and firm-related antecedents. Likewise, outcomes are categorised into those associated with the customer perspective and those associated with the firm perspective. The framework takes up the notion that trust and satisfaction act as both antecedents and outcomes of engagement. Figure 6 provides an overview of all variables included in the review of Ng et al. (2020, p. 244) involving the engagement antecedents, their dimensionality and manifestation in the centre, and their outcomes. The dynamics and iterative process of engagement are further supported by evidence of studies in a business-to-business (B2B) context, which suggest that trust and satisfaction function as both antecedents and outcomes of engagement in business relationships (Brodie et al., 2019, p. 181), e.g., participating in product development (Marcos-Cuevas et al., 2016).



*Figure 6: Overview of manifestations, antecedents, and outcomes of customer engagement
(based on Ng et al. (2020, p. 244))*

Recent literature aims to further shape and verify the conceptual domain of engagement in a broader context such as actor engagement, stakeholder engagement, or B2B engagement, and also include studies on its antecedents and outcomes. Jonas et al. (2018) and Loureiro et al. (2020) tried to determine what the constituting antecedents and consequences of stakeholder engagement are, while Ekman et al. (2021) reveal a wide range of business actor engagement characteristics and the interplay of central business actor engagement attributes.

Jonas et al. (2018) empirically identified eight antecedents for stakeholder engagement in innovation in the context of a B2B environment through a single case study. More specifically, their data shows how stakeholder engagement is influenced on the individual and organisational levels by the antecedents of friendship, common experiences, self-representation, trust, common goals, resource dependency, hierarchical level, institutional arrangements, and local proximity (Jonas et al., 2018, pp. 412–413). Seven of these antecedents were derived theoretically, based on Storbacka et al.'s (2016) remark on observable engagement activities and one antecedent, the local proximity, was found from their own data set. While previous studies on customer engagement have commonly centred on the individual customer's state of mind, the antecedents identified by Jonas et al. (2018) operate across organisational boundaries.

Loureiro et al. (2020) systematically reviewed the literature on stakeholder engagement in co-creation processes for innovation, similar to Ng et al. (2020), who reviewed the literature on

customer engagement. As a result, Loureiro et al. (2020, p. 391) provide a conceptual model for stakeholder engagement in co-creation activities, which was constructed quite similarly to the model of van Doorn et al. (2010). The model's antecedents are divided into stakeholder-based factors such as leadership style, empowerment, or goals; firm-based factors such as culture, capabilities, or resources; and context-based factors such as politics, economics, or competition. In the centre, the authors depict stakeholders' network engagement differentiated into a firm's internal and external stakeholders. The co-creation activities represent the consequences of stakeholder engagement in the form of co-innovation, co-design, and co-production activities. The conceptual model was subsequently validated by the authors through a case study with 22 companies. From this study, 14 elements emerge, all of which match the factors of the conceptual model as previously suggested by the authors. The study's findings support eight elements as stakeholder-based antecedents (leadership, trust, commitment, satisfaction, identification, partnership goals, interdependence benefits, and long-term outcomes) and three elements as firm-based antecedents (organisational culture, communication capabilities, and organisational capabilities). Furthermore, three elements of the study (information exchange quality, affinity, and power) allude to interactions within the stakeholders' network. However, context-based antecedents appear not to be relevant.

Finally, Ekman et al. (2021) reveal a wide range of business actor engagement characteristics and the interplay of business actor engagement attributes. To explore and conceptualise the characteristics of business actor engagement, the authors adopted a systematic combining approach, and thus actively followed the growing literature on engagement and at the same time carried out an in-depth study by conducting interviews within the commercial real estate industry. Following the theoretical considerations of Fehrer et al. (2018), their results show that the engagement disposition of a business actor, and the actor's engagement connectedness with the provider, comprises the core antecedents to business actor engagement (Ekman et al., 2021, p. 183). Building on these dynamics, they propose a conceptual business actor engagement framework that depicts the central attributes of the engagement disposition. These are the strategic fit, experience, and attributes of the engagement connectedness, including the interaction characteristics and the relationship foundation.

As shown in the above review, several antecedents and outcomes of customer and actor or stakeholder engagement have been proposed. For the purpose of this study, the individual and organisational level antecedents for stakeholder engagement identified by Jonas et al. (2018,

pp. 412–413), including friendship, common experiences, self-representation, trust, common goals, resource dependency, hierarchical level, institutional arrangements, and local proximity are the most relevant. These could also prove to be influencing factors for actors to support a new venture in BM design.

3.2 Actor Roles

The social sciences literature widely distinguishes actor roles through role theory and multiple other approaches to understand roles (Biddle, 1979; Linton, 1936). The concept of *role* has its origin in the 19th century and was tied to the theatre until the development of the science-based *role theory* in the 1930s (Leutz, 1974, p. 36). It thus started out as a theatrical metaphor, with the character mask being deemed to be the precursor of the role theory (Petzold & Mathias, 1982, pp. 24–25). The role concept is tied to the belief that the social behaviours of actors in different contexts are associated with roles and scripts, just as actors in theatre performances follow predetermined scripts. In theory, the concept attempts to adequately describe, explain, and predict the relationship between an individual and society or between actors and systems (Griese, 1989, p. 547).

In the following sub-chapter, the development of the role concept and the explanatory approaches to role theory are reviewed, after which some established conceptualisations of role concepts and empirical insights on existing role concepts are presented.

3.2.1 Role Theory

An interest in role theory has arisen in some of the central arenas of sociology and social psychology. While only a few sociological terms have been as widely accepted as role theory, few terms have simultaneously remained so fuzzy and ambiguous (Griese, 1989, p. 549). Thus, to date, there is still no consistent concept or theory of role. The term *role* is actually a reference to a whole group of related terms, which then form the role theory as a conceptual system, including position or status, expectations, reference groups, behaviour (expected and actual), self-performance, identity, identification, segment, distance, and conflict (Griese, 1989, pp. 550–551).

Role theory was developed from two approaches, namely a micro-sociological and a macro-sociological view. At the intersection of these two theoretical approaches or perspectives, role

theory stands as a middle-range theory that deals with the mediation between behavioural mechanisms of the individual and the system (Griese, 1989, pp. 548–549). The first sociological and social psychological role theory approaches date back to the work of George Herbert Mead (1934) and Ralph Linton (1936). At the same time, the social psychiatric role theory, which is used in modern group psychotherapy and psychological group work (Petzold & Mathias, 1982, p. 16), was developed according to Jacob Levy Moreno (1934). Because these early proponents differed in the ways they used role terms, confusion entered role theory.

Symbolic interactionist perspective

Mead's (1934) ideas led to the development of the symbolic interactionist perspective on roles. It highlights the roles of individuals, the evolution of roles through social interaction, and by which means social actors understand and interpret their own and others' behaviours (Biddle, 1986, p. 71). Mead (1934) explains that it is through interactions with others that an actor learns to identify him or herself as seen by others. It is through these interactions that actors identify their social selves (Mead, 1934). Hence, certain interactions lead people to classify themselves as male or female, as mother or daughter, or as employee or customer, and to learn the behaviours associated with the respective identities. One can then retrieve those identities that seem most appropriate to present oneself in a particular context (Knowles, 1982, p. 6). Building on this, Mead (1934) introduced the central term of *role-taking* (Griese, 1989, p. 549), which describes the adoption of a role in an interaction situation and occurs when a person holds the expectations that map the expectations of others (Biddle, 1979, p. 189).

Mead's (1934) perspective was especially complemented by Turner (1955/56, 1962) through the concept of *role-making*. Role-making implies that behavioural expectations—and thus a role itself—can be changed, remade, and taken over without identification, but with so-called role distance and through self-performance (Griese, 1989, p. 549). Taking a role implies that an actor never merely takes on the role, but also changes it through his or her individuality because two people will never take on or play a role in the same way (Griese et al., 1977, pp. 44–46). Knowles (1982, p. 7) describes the process of role-making by explaining that “roles exist in varying degrees of concreteness and consistency, while the individual confidently frames [one's] behaviour as if they had unequivocal existence and clarity. The result is that in attempting from time to time to make aspects of the roles explicit [one] is creating and modifying roles as well as merely bringing them to light”. The symbolic interaction is then an

anticipatory (role-taking) and innovatory (role-making) process of mutual negotiation and interpretation of roles by individuals who learn these abilities in the process of socialisation (taking on the roles of others) (Joas, 1978).

Structural functionalist perspective

Linton (1936) started to approach role theory with an (cultural) anthropological approach, in which he focused on the distinction between role and status (position in a social system) (Griese, 1989, p. 549). This approach is known as the structural functionalist perspective on role theory, which was introduced into German sociology by Dahrendorf (1958) through his work, “Homo Sociologicus” (Griese, 1989, p. 549). The perspective grew out of attempts to represent social structure (Knowles, 1982, pp. 6–7). Linton (1936, p. 164) initially coupled role and status by pointing out that “role represents the dynamic aspect of a status [...]. When rights and duties, that are constituting a status, become effective, one is performing a role. Role and status are completely inseparable. [They] serve to reduce the ideal patterns of social life into individual terms.” He later defines the role as “the sum total of the cultural patterns associated with a particular status. It thus includes the attitudes, values, and behaviour ascribed by the society to any and all persons occupying this status” (Linton, 1947, p. 50). Accordingly, the social role is a set of internalised cultural patterns that belong to a given status and behaviour, under the assumption that an individual has exactly this status and no other (Szmatka, 1978, p. 68). Biddle (1986, pp. 70–71) summarises these thoughts by explaining that the functional perspective on role theory focuses on the characteristic behaviours of persons who occupy (social) positions in a system to which certain rights and duties are tied. Roles are thus built on shared, normative expectations that prescribe and explain these behaviours and hence they describe the behavioural enactment of rights and duties by an individual, whereby the social structure provides positional niches into which the individuals fit when they perform a role (Knowles, 1982, pp. 6–7). Nonetheless, Dahrendorf (2006, p. 37) argues that of the two concepts of position and role, the concept of role is by far the more important. His argument for this assertion is that, while positions only designate places in reference fields, the role specifies the kind of relationship between individuals holding positions and individuals of other positions in the same field.

Linton’s (1936) version of the role concept was subsequently further developed and formulated by Parsons (1937, 1951), who describes the pattern variables (behavioural alternatives)

available to an actor in a given role. On this basis, his student Merton (1957, p. 110) developed the so-called role set, which he describes as a set of roles that are performed by a given person. The author premises that each social status involves not only a single role, but rather an array of roles which includes several role relationships in which a person is involved by virtue of occupying a particular social status. Some elements of these sets of roles may overlap and others may differ, and thus a role sets consist of roles that are partially differentiated (Biddle, 1979, p. 76).

Given these multiple roles and norms, individuals are sometimes subject to *role conflicts*. Biddle (1986, p. 82) defines role conflicts as “the concurrent appearance of two or more incompatible expectations for the behavior of a person”, e.g., of an individual as a father and teacher. Accordingly, conflicts are a result of contradictory or incompatible expectations and behavioural requirements of roles occupied by an actor (Biddle, 1986, p. 82; Griese et al., 1977, pp. 30–31). Role conflicts can be classified into several categories, with intra-role conflicts, inter-role conflicts, and person-role conflicts being the most common categories (Wiswede, 1977, p. 155). Stadler and Kern (2010, pp. 153–154) explain the three categories, commencing with intra-role conflict which is understood as the discrepancy between the role a person performs, the demands this role places on the person, and the person’s value system. If there are contradictions between different roles an individual holds, this is called an inter-role conflict, while a person-role conflict refers to contradictions between the role expectations someone has of themselves and how that person actually behaves. Moreover, Stadler and Kern (2010, pp. 154–156) take up the two categories of intrapersonal and interpersonal role-conflicts. Intrapersonal conflict expresses the discrepancy between one’s own role definition and the expectations of others, whereas interpersonal conflict refers to a controversy between two people and their different roles.

Personality perspective

The third formative character of role theory is Moreno (1934). His students Leutz (1974) and Petzold and Mathias (1982) attempted to chronologically summarise the development of role theory according to Moreno and highlight his most important statements and findings. Petzold and Mathias (1982, pp. 85–86) did not find a differentiation of role categories nor an explicit definition of the concept of role in Moreno's texts from the period spanning 1932 to 1939. Implicitly, however, the authors find that Moreno both regards the role as a sequence of behaviours embodied in a spontaneous act or play, and as a pattern determined by social situations. This indicates an integrative role concept, whereby the individual and the collective aspects converge. On the one hand, Moreno defines roles as patterns that have been developed in a specific culture (Moreno, 1940, p. 20), and on the other hand as "the crystallization of all the situations in a special area of operations through which the individual has passed (for instance the eater, the father, the airplane pilot)" (Moreno, 1946, p. 153). Petzold and Mathias (1982, p. 86) conclude that the attempt to link the individual and society through the concept of role is becoming more and more apparent. Hence, Moreno's approach differs from role theorists such as Mead (1934), Linton (1936), and Parsons (1951) who put the social imprint of a role in the foreground, in that he additionally assumes that it is up to the individual to personally shape the roles they occupy (Petzold & Mathias, 1982, p. 86). Thus, in addition to the social determination of a role, such as the formative influence of social role patterns, norms, and values that shape one's behaviour, Moreno also attaches importance to personal, creative freedom (Stadler & Kern, 2010, p. 137).

In his early work, Moreno (1934) also initiated the discussion on the term *role-playing*, which should not be confused with *role-taking*. Moreno based his thoughts on role-playing on the behaviour of children and explains that a role is not only perceived, but a person can actively put themselves in a role (role-taking) and play it (role-playing) (Leutz, 1974, p. 43). Role-playing occurs when a person attempts to imitate the roles of others (Biddle, 1986, pp. 74–75), whereas role-taking concerns the veracity of thoughts, meaning that a person truly holds expectations in which he or she (correctly) maps the expectations of a sentinel other (Biddle, 1979, p. 189).

All three major approaches to role theory can be said to deal with a triad of concepts: social behaviours, roles or identities, and expectations of the behaviours of (social) actors (Biddle, 1986, p. 68). Thereby, role expectations are associated with beliefs, attitudes, norms, or

expected behaviours that persons should or should not exhibit while enacting a role (Stone-Romero et al., 2003, p. 333). Role expectations exist in the minds of persons and are shared between individuals, whereby a social consensus, inducing social structure and culture, emerges (Eagly & Wood, 2016, p. 460). By way of summary, Biddle (1979, p. 8) lists five underlying propositions of role theory about which there is general, albeit informal, agreement:

- Some behaviours are patterned and are characteristic of persons within contexts, i.e., form roles.
- Roles are often associated with sets of persons who share a common identity, i.e., who constitute social positions.
- Persons are often aware of roles, and to some extent, roles are governed by their awareness, i.e., by expectations.
- Roles persist, in part, because of their consequences or functions and because they are often embedded within larger social systems.
- Persons must be taught roles, i.e., must be socialised, and may find either satisfaction and dissatisfaction in the performance thereof.

Resource perspective

Later research contrasted these existing assumptions. Callero (1994) undertook a subsequent attempt to aid in developing a new approach to role theory to address the so-called *agency-structure duality*. His novel approach, which he refers to as the resource perspective, addresses the central question of “how are we to conceive of the relationship between individual agency and collective structure?” (Callero, 1994, p. 228). The author built on the work of Baker and Faulkner (1991) who introduced the concept of *role as resource*. Baker and Faulkner (1991, p. 281) first refer to the fact that roles are usually thought to be enacted from a fixed, pre-existing position according to Linton (1936). Then, the authors contrast and reverse this process by arguing that “roles are first claimed and then enacted into positions. Roles are used to create positions and their relationships, i.e., social structures. Social structures are created by concretising (abstract) roles into real positions” (Baker & Faulkner, 1991, p. 281). In this manner, Baker and Faulkner (1991) show how roles are used as a resource for granting access to cultural, social, and material capital and making action possible (Callero, 1994, pp. 229–230), whereby the concept of *role-playing* is replaced with the idea of *role-using* (Callero, 1994, p. 241).

Action-based perspective

A more recent approach is presented by Nyström et al. (2014), who introduce and utilise the action-based perspective on role theory. The authors focus on innovations in living labs to identify innovator roles. Nyström et al. (2014, p. 485) argue that the already existing perspectives on role theory have a constructivist base, with which one can make sense out of what happens. However, prior research on innovator roles and role tasks propose a normative approach to roles by stressing actions that should be taken or roles that should be played for innovations to occur (Gemünden et al., 2007; Heikkinen et al., 2007). To address this controversy, the action-based approach to role theory “suggests that an actor’s role is created through actions and that an actor takes an ideal role in an attempt to achieve a goal. The tasks associated with the ideal role determine how that role is played out, which resources to access and use, which actors to team up with, and which networking goals to consider realistic under time and resource limitations” (Nyström et al., 2014, p. 485).

Furthermore, role theory typically concentrates on individuals and their behaviours. Katz and Kahn (1966) and Heikkinen et al. (2007, p. 911) enlarge this focus by using the role concept in the context of *organisational role theory*. Katz and Kahn (1966, p. 173) understand organisations as systems of individuals who are performing roles that are primarily constituted through interactions between the individuals. The expected behaviours and related roles that individuals enact should, thus, rather be understood as a function of the surrounding structure than that of the individual’s personal characteristics (Katz & Kahn, 1966, p. 174).

According to the many perspectives of the concept of role and role theory that have been introduced, and the long period over which these have evolved and been formulated, there is a long line of definitions of role. After examining various definitions and approaches to role theory, Biddle (1986, p. 86) did not find a general and uniform explanation of the concept of role and role theory. However, it can generally be stated that a role can be understood as a structured link between the expectations of an individual in a given social situation and the explicit actions of that individual in this situation (Turner, 2001, p. 233). Selected definitions of a role are listed in table 12. These agree on several elements, which enables researchers to derive a general understanding of a role as a specific behaviour of an individual that is built on the status, norms, or expectations that result from the relation or interaction with other individuals.

Table 12: Selected definitions of role

Author(s)	Definition
Parsons (1951, p. 51)	A role is “what the actor does in his relation with others”.
Katz and Kahn (1966, p. 179)	Roles are “activities which in combination produce the organizational output”.
Bates and Harvey (1975, p. 106)	A role is “a particular set of norms that is organised about a function”.
Turner (1979, p. 124)	A role is a “comprehensive pattern for behavior and attitude”.
Allen and van Vliert (1984, p. 3)	A role is a “behavior referring to normative expectations associated with a position in a social system”.
Griese (1989, p. 547)	“A role is a bundle of expectations that attach themselves to the behaviour of the bearers of positions in a given society. [...] In this respect, each individual role is a complex or group of behavioural expectations.”
Hogg et al. (1995, p. 265)	Roles are “self-conceptions, self-referent cognitions that agents apply to themselves as a consequence of the social role positions they occupy”.
Krotz (2008, p. 33)	Roles are a form that an individual chooses to take in order to relate to himself/herself and to others who in turn also act within the framework of their roles.
Andrews (1975, p. 529)	Roles are social positions (as well as a socially recognised category of actors) which are constituted by ego and alter expectations regarding the purpose of an actor in an organised group.

3.2.2 Role Concepts in Innovation

Since the 1970s, researchers (e.g., Biddle, 1986) have considered role theory to be especially useful for creating an understanding of the dynamic research phenomena of organisational roles by analysing actions of individuals who are creating, interpreting, modifying, and organising roles (Zurcher, 1983). Regarding roles in a business context, extant research provides multiple explanations about the positions and tasks of actors. Role concepts differ both in terms of context (e.g., value co-creation, innovation management, knowledge management) and in terms of the actors in focus (e.g., public institutions, employees, customers). Thus, a variety of different mutually complementary roles that can be taken by actors inside and outside a company have been defined. The literature on roles focuses on customer roles (Chervonnaya, 2003; Gouthier & Schmid, 2003; Moeller et al., 2013; Öberg, 2010; Sampson & Spring, 2012), user roles (Bechmann & Lomborg, 2013; Füller et al., 2014; Hacker et al., 2017), employee roles (Huber & Kleinaltenkamp, 2018; Webster & Wind, 1972), managerial roles (Frohman, 1978), or general stakeholder and actor roles in different contexts such as innovation management (Battistella & Nonino, 2012; Butzin & Terstriep, 2018; Dedehayir et al., 2018; Gemünden et al., 2007; Goodman et al., 2017; Hering & Phillips, 2005; Markham et al., 2010; Nyström et al., 2014; Story et al., 2011; Witte, 1973). There has also been a tendency to treat

the actor and the role as largely synonymous (Story et al., 2011, p. 955), and hence a funder performs a funding role or a designer performs a designing role.

The literature on innovation management features a multitude of concepts for analysing the roles of key actors in innovation processes and several innovator roles that are crucial to innovation have been identified. These roles are incorporated with innovation activities between and within organisations and often have an impact on the innovation (Leminen, 2015, p. 64). The research fundamentally addresses the individual's level and includes the primal roles of the gatekeeper (Allen, 1970; Markham et al., 2010; Tushman & Katz, 1980) and champion (Howell & Higgins, 1990a, 1990b; Markham & Griffin, 1998; Schon, 1963). The research in German-speaking countries has developed four additional innovator roles that exhibit a significant positive influence on innovation success, namely the expert-, power-, process-, and relationship promoters (Gemünden, 1985; Gemünden et al., 2007; Herrmann et al., 2006; Walter & Gemünden, 2000).

The gatekeeper role was introduced to innovation and management literature by Allen (1970). The gatekeeper performs activities such as filtering, disseminating, exchanging, communicating, and assembling required information from various sources and networking (Allen, 1970). The champion model, on the other hand, dates back to Schon (1963). In his research on radical innovations in the American military, Schon found that in the context of meaningful innovations, actors who displayed above-average engagement played a key role. These actors are responsible for the success of an innovation, starting from the original idea to the innovation finally being established on the market (Schon, 1963, p. 84). Schon (1963) defines these actors as champions and describes them as individuals who hold sufficient power and prestige in an organisation, know how to use a company's informal system of relationships, and possess differentiated expertise (technology, marketing, production, and finance) to develop an innovation (Schon, 1963, p. 85). Champions generate ideas, transform them into innovation, and commercialise them to the market (Howell, 2005, p. 108). Thus, the champion model focuses on a single person acting alone who, as a generalist, combines several roles (Mansfeld, 2011, p. 35).

The starting point for the research on the promoter model was Witte's (1973) research within the framework of the Columbus project on the initial procurement of electronic data processing equipment in Germany in 1973. Witte (1973, p. 6) started with the fundamental consideration

that the willingness of individuals to actively participate in the decision-making process and their ability to make problem-solving contributions in innovation processes are only weakly developed. The author considered these behaviours as barriers to innovations that must be overcome. Addressing these barriers, Witte dealt with the question of how certain personalities influence the success of innovation processes (Hauschildt & Gemünden, 1998, p. 1) and focused on the conflict-regulating performance of promoters (Mansfeld, 2011, p. 23). Promoters were subsequently defined as actors, who “foster an innovation process actively and intensively” (Witte, 1973, p. 15). Thus, promoters use their source of power to actively and intensively promote an innovation process (Huber & Kleinaltenkamp, 2018, p. 19). Gemünden et al. (2007, p. 409) distinguish between four promoter roles, namely the expert-, power-, process-, and relationship promoters. The authors explain that the power promoter has the necessary hierarchical power to drive the project, provide needed resources, and help overcome any obstacles. Second, the expert promoter has specific technical knowledge that is needed in the innovation process. The third role, the process promoter, possesses organisational know-how and intra-organisational networks and has the necessary diplomatic skills to bring together the people necessary for the innovation process. Lastly, the relationship promoter has strong personal ties to actors inside and outside the company. Gemünden et al. (2007, p. 410) conclude that the champion largely parallels the process promoter.

Finally, other researchers have highlighted further roles that can be seen as a subdivision of the gatekeeper role (Allen, 1970), champion model (Schon, 1963), and promoter model (Gemünden et al., 2007; Witte, 1973) or a combination of these (Battistella & Nonino, 2012, p. 4). Galbraith (1982, pp. 9–11) refers to three key roles in organisational innovation that guide a new idea through the innovation process. These are the idea generator, sponsor, and orchestrator. The author describes idea generators as individuals who create an innovative idea that could be of potential use to the organisation. The sponsor, or idea champion, refers to a person who recognises the usefulness of an idea and provides authority and resources to develop and implement the innovation. The third role, the orchestrator, is an individual who is a central player in the communication network. Meyer (2000) expands the role model of Galbraith (1982) and indicates that those who have the power to champion innovation are also capable of challenging it. The author identifies an additional innovation role that he termed the *devil's advocate*.

Moreover, it can be noted that a great deal of the literature takes a special focus on customers or users who play different roles in the integration or value creation process, and which are of considerable importance in the innovation, development, production, and downstream phases (Agrawal & Rahman, 2015; Chervonnaya, 2003; Desouza et al., 2008; Füller et al., 2014; Gouthier & Schmid, 2003; Öberg, 2010). In this context, a rich stream of the literature concentrates on the roles that individuals play in general and innovation networks (Heikkinen et al., 2007; Nyström et al., 2014; Story et al., 2011). Especially those roles that can be assigned to different groups of actors fit the purpose of this paper very well and are thus outlined in more detail.

Heikkinen et al. (2007, p. 909) focus on general network management research and propose roles related to the organisational level. In an empirical study using in-depth interviews and internal company information (e.g., e-mail), Heikkinen et al. (2007) identified 12 roles for business network management by mapping actors' tasks in traditional networks. The study was conducted as part of the development and testing of new mobile services, taking into account stakeholders such as software companies and investors (Heikkinen et al., 2007, p. 914). In their results, the authors differentiate between network level and task level roles. These include the webber, instigator, gatekeeper, advocate, producer, planner, entrant, auxiliary, facilitator, compromiser, aspirant, and accessory provider. Some of these roles' characteristics are quite similar to those of the promoter roles by Gemünden et al. (2007). Accordingly, the webber can be compared to the relationship promoter and the gatekeeper is comparable to the power promoter. Furthermore, Heikkinen et al. (2007, pp. 921–922) indicate that none of the actors acted out only a single role but rather that their actions determine their roles and actors act in many roles.

Story et al. (2011, pp. 957–961) take on the approach by Heikkinen et al. (2007) and also distinguish between task-oriented and network-oriented roles. In this case, the authors shift the focus to radical innovations and collect data through in-depth interviews with network participants in the automobile industry. They investigate in which ways relationships and networks support radical innovations and focus on when and how network partners become involved and how their role performances support the development of discovery, incubation, acceleration, and commercialisation competences. In total, the authors identify five task-oriented and three network-oriented role behaviours. These include articulating, funding, developing, prototyping, producing, connecting, integrating, and endorsing. Most of these role

behaviours share similarities with certain roles of Galbraith (1982), Gemünden et al. (2007), and Heikkinen et al. (2007). For example, funding behaviour shares similarities with the role of the sponsor, or idea champion, by Galbraith (1982), as both roles describe actors who are involved in turning an idea into a clearly articulated concept or help to implement an innovation. Another example is that of producing, which comes close to the role of the producer suggested by Heikkinen et al. (2007). Accordingly, the identified behaviours are not only allocated to the context of radical innovations. As a conclusion, and in line with Heikkinen et al. (2007, pp. 921–922), the authors demonstrate that one actor can perform several different roles and therefore, that role performance should be understood as a dynamic concept (2011, p. 956).

In this regard, Nyström et al. (2014, pp. 486–487) also amplify the role concept by Heikkinen et al. (2007) by focusing on innovation networks, in particular networks of open innovations. The authors analysed 26 living labs in Finland, South Africa, Spain, and Sweden, whereby they define living labs as networks of open innovations characterised by openness and user involvement. Nyström et al. (2014) aim to investigate how innovation is organised in these living labs. The results reveal 17 actor roles, seven of which had previously been suggested by Heikkinen et al. (2007) in connection with traditional networks. These are the webber, instigator, gatekeeper, advocate, producer, planner, and accessory provider. In addition, Nyström et al. (2014, pp. 486–487) identify 10 new and previously unknown roles, which include the coordinator, builder, messenger, facilitator, orchestrator, integrator, informant, tester, contributor, and co-creator. As was the case in the studies that were discussed before, most of these roles also share similarities with previous role concepts. For example, builders are akin to the relationship promoter by Gemünden et al. (2007) and share similarities with the webber identified by Heikkinen et al. (2007). Furthermore, the messenger shares similarities with the role of the idea champion or sponsor suggested by Galbraith (1982), because both roles recognise and foster ideas by leveraging information on the net. The tester tests innovation in (customers') real-life environments, thereby sharing similarities with the role of prototyping suggested by Story et al. (2009). Finally, the contributor collaborates intensively with the other actors in the network to develop new products, services, processes, or technologies and thus comes close to that of the producer suggested by Heikkilä and Heikkilä (2017). Nyström et al. (2014, p. 488) also confirm the findings of Heikkinen et al. (2007, p. 920) and Story et al. (2011, p. 956) on the fact that one actor can take on several roles and describe this as role diversity.

On a conceptual level, Dedehayir et al. (2018) undertook a systematic literature review and propose several roles seminal to the innovation ecosystem's birth. The authors describe innovation ecosystems as the collaborative effort of a diverse set of actors towards innovation. Thus, they portray a context that was very similar to that of innovation networks as discussed beforehand. Dedehayir et al. (2018) identify four thematic groups of actor roles in terms of the specific activities the actors carry out. These include leadership roles (ecosystem leader and dominator), direct value creation roles (supplier, assembler, complementor, and user), value creation support roles (expert and champion), and entrepreneurial ecosystem roles (entrepreneur, sponsor, and regulator). Most of these roles are similar to those that have already been discussed and explained or are self-explanatory (e.g., the expert). Still, Dedehayir et al. (2018) mention several novel roles that were not previously mentioned, including the dominator, assembler, complementor, entrepreneur, and regulator.

Furthermore, looking at social innovation processes, Butzin and Terstriep (2018, pp. 78–79) analyse the influence of different actors, including the public sector, private companies, civil society, foundations, social enterprises, individuals and groups, research and education centres and others. In so doing, the authors show which roles are played by these actors. The authors identified four roles, namely developers, promoters, supporters, and knowledge providers. These role models are consistent with the research on innovation and network actors (Heikkinen et al., 2007; Nyström et al., 2014; Story et al., 2011). Additionally, innovation processes for social innovations are, according to the findings of Butzin and Terstriep (2018, pp. 80–81), particularly influenced by non-governmental organisations (e.g., lobbying), public institutions (e.g., knowledge transfer), and private companies (e.g., infrastructure provision).

Gemünden et al. (2007, pp. 408–409) also state that there are some claims that innovator roles are particularly important in the early stages of innovation projects and for highly innovative ventures (Hauschildt & Keim, 1999; Howell & Shea, 2001), although the authors do not share this view as it has neither been elaborated theoretically nor tested empirically. In response, Böhm et al. (2019) took the first step by showing direct and indirect interactions of start-ups with various actors in the innovation system. The authors conducted a systematic literature analysis and used a qualitative-empirical approach by interviewing a total of 50 start-ups and eight innovation intermediaries. As relevant actors in this context, Böhm et al. (2019) highlight universities, established private companies, investors, employees, and public institutions. Universities can provide start-ups with infrastructure, technologies, knowledge, and ideas and

at the same time act as a quality marker. In this context, universities can also take the role of a mentor, which e.g. supports funding activities (Böhm et al., 2019, p. 61). In addition, start-ups use established private companies to gain market access and in return provide benefits for these through technologies, knowledge, and reputation enhancement (Böhm et al., 2019, p. 34). Start-ups can also profit from investors' networks and know-how, which in addition increases the start-ups' reputation. Moreover, public institutions play an important role in the innovation system of start-ups, e.g., through financing and support programs, providing infrastructures and setting regulations (Böhm et al., 2019, p. 69).

To summarise, the review of the previous role typologies reveals quite a large variety of identified roles in different contexts and identification characteristics and yields important insights. While there seems to be no single role typology that can be generalised especially well, it can be expected that some of the identified roles may apply to BM design in new ventures and create a basis for this paper's empirical studies. However, some of these previous findings may also be limited to their specific investigation domain, as designing a new BM differs substantially from previous studies in innovation contexts. First, they are often centred on one person, namely the founder of a new venture, who shows a special performance by acting and taking on multiple roles. Second, while some innovation processes offer monetary or other kinds of returns to contributors, there is no such benefit for actors, who support a new venture in BM design, since usually only a fraction of the ideas and BMs become companies that actually enter the market. Thus, behaviours must be differentiated into mandatory and voluntary behaviours, whereas voluntary behaviours may result in new, not yet identified roles. Third, BM design requires specific contextual knowledge, skills, and experience. In contrast, actors in other innovation contexts are mostly diverse in their backgrounds, experiences, and expertise. In addition, roles that are unique and specific to BM design with a special focus on the pre-seed phase have not been considered in previous studies. Further research into the roles of these actors can be considered as an important step to gain a better understanding of the functioning and success of BM design in the pre-seed phase. Therefore, this paper understands a role as an expected behaviour of an actor in a certain position, rather than referring to a stakeholder or an actor itself, or their archetypes, demographic groups, and typologies.

4 Project I: Engagement and Experimentation in Business Model Design

The fourth chapter of this paper presents the first of the three research projects that investigate thought experimentation and actor engagement in the context of BM design. The following remarks reproduce the contents of the paper by Roth et al. (2021) in a very similar fashion. The objective of the following study is to examine how thought experimentation appears in BM design processes of new ventures. Another objective is to provide empirical insights on actor behaviours and their integrated resources which influence if, and how, thought experimentation is manifested. Specifically, the aim is to explore how and by which resources actors support and influence thought experimentation, whereby research on experimentation is combined with research on actor engagement.

The starting point for addressing the first and second research question was the emerging interest in research on BMI. A preliminary literature review on the topic of BMI highlighted experimentation as a prominent method in the process of BMI. However, the literature pays little attention to the extent to which experimentation takes place in the pre-seed phase. In addition, little is known about the specific methods of cognition and thought experimentation, i.e., about experimentation as a mental construct. Hence, as a starting point, this study was guided by the need to recognise experimentation from a more profound level of analysis, extend its current perspective, and explore key characteristics and forms of thought experimentation.

In addition, the literature emphasises that in thought experimentation different actors besides the founders themselves (e.g., family, research institutions, investors) are involved, interact, and reflect on a new venture's possibilities to design a BM (Mansoori & Lackeus, 2019). For instance, Margiono et al. (2018) argue that new BMs are developed through inter-organisational arrangements to cope with resource scarcity and resource dependence on others. The influence of external actors may be particularly salient as these actors could influence founders' thoughts and mental schemas through their behaviours and interactions. Additionally, the actors provide access to resources and help in decision-making. Accordingly, this paper addresses the question of the considerable role different actors play in how a new venture's BM is developed. Put more simply, it asks how and to what extent BM design depends on actors other than the founders.

Due to a considerable need to access resources without any return in the pre-seed phase, this study aims to specifically explore actors' voluntary resource contributions to support thought experimentation.

To pursue these research aims, the following chapter gives an overview of the methodology. Subsequently, the conduction of the study and the resulting findings are presented. The chapter ends with a discussion.

4.1 Methodology

Given the exploratory nature of the study, a qualitative research approach was deployed to address the research aims (Patton, 1989). Interviews were the principal data collection method that was used, as it is an appropriate method to obtain retrospective and real-time data on the experience of actors (Gioia et al., 2013). Since in-depth interviews comprise the most important data collection in the context of this first study and the complexity of the analysis is high, the method is explained in detail. The interviews were analysed with the help of the theoretical reasoning of abductive logic. Before theoretically explaining the abductive approach, an insight into when and how to deploy in-depth interviews is provided.

4.1.1 Qualitative Interviews

The in-depth interview or guided interview is a relatively free qualitative interview in the form of a conversation, that intends to gain deeper insights into the object of investigation and, in particular, explore the ways of thinking, feeling, and acting of individuals through psychologically skilful questions (Riesmeyer, 2011, p. 224). In-depth interviews are mostly partially-standardised interviews for which the interviewer has the topic of the survey on hand in addition to a list of predefined questions, through which the flow of the conversation is guided to some extent (Gläser & Laudel, 2010, pp. 41–42). This relatively flexible approach is highly recommended because a deeper understanding of the topic and the associated concrete questions will only emerge during the survey (Homburg, 2017, p. 265).

The in-depth interview is employed in preference to a group interview or a focus group interview for several reasons. Focus group interviews are not intended to exploratively compile a question (Mayerhofer, 2009, p. 479). In-depth interviews, in contrast, help uncover more nuanced contextual factors surrounding a novel research application (Stokes & Bergin, 2006,

pp. 34–35). In-depth interviews are commonly conducted as individual interviews. The interview mode is either a personal face-to-face interview or an interview via telecommunication media (e.g., telephone). Hence, the one-on-one nature of in-depth interviews yields a more flexible inquiry and can establish a greater sense of trust and rapport between interviewer and interviewee, which can improve the comprehensiveness and quality of the data (Stokes & Bergin, 2006, p. 28). The purpose of this study is to understand the influence and behaviour of individual actors, which could only be explored in a very undifferentiated and superficial manner in a group discussion. The face-to-face interview is more appropriate to allow the interviewer to specifically address the verbal and non-verbal reactions of the interviewee and to handle a complex and sensitive topic. The possible number of questions and the unrestricted duration of the face-to-face interview also underpins the suitability of using this method (Böhler, 2004, pp. 94–95).

In the following, in-depth interviews form the main data collection method. In a broad sense, the in-depth interviews aim to explore the background and methods in BM design in new ventures and the behaviours and resources of different actors.

4.1.2 Abductive Reasoning

Abductive reasoning is depicted as a third form of reasoning to the two basic, well-established forms of inductive and deductive reasoning. Mantere and Ketokivi (2013, p. 72) indicate that elements of these three types of reasoning can be found in all research when researchers make inferences from a case (use deduction), make generalisations (use induction), and search for explanations (use abduction). Researchers predict, confirm, and disconfirm through deduction, generalise ways through induction, and theorise through abduction (Mantere & Ketokivi, 2013, p. 72). Therefore, it is useful to explain deductive and inductive reasoning before going into detail with abductive reasoning.

According to Hurley (2000, p. 33), a deductive argument is “an argument in which the premises are claimed to support the conclusion in such a way that it is impossible for the premises to be true and the conclusion false.” In other words, if the premises are true, then the conclusion is necessarily true. In contrast, an inductive argument is “an argument in which the premises are claimed to support the conclusion in such a way that it is improbable that the premises be true and the conclusion be false” (Hurley, 2000, p. 33). According to this definition, the inferential

link between the premises and the conclusion is not one of necessity, but of probability. In a slightly different way, Dubois and Gadde (2002, p. 559) explained that in deductive reasoning researchers develop propositions from current theory and make them testable in the real world. In contrast, inductive approaches rely on the grounded theory approach (Glaser & Strauss, 1967), in which theory is systematically generated from data (Dubois & Gadde, 2002, p. 559). While inductive reasoning thrives on the plurality of newly collected empirical data to establish further conceptualisations of a phenomenon, deductive reasoning is based on the proof or falsification of existing conceptualisations (Timmermans & Tavory, 2012, pp. 170–171). Accordingly, inductive reasoning is driven by shortcomings in the understanding of previous studies or phenomena, while deductive reasoning is based on the cumulative knowledge of previous work but is also limited by the rigidity of previous work (Perry & Bellamy, 2012).

In addition to these two basic forms of reasoning, the literature emphasises abductive reasoning as a third form. Many sources emphasise that the term *abduction* was coined by Peirce and Buchler (1955) (Dubois & Gadde, 2002; Mantere & Ketokivi, 2013; Timmermans & Tavory, 2012). Initially, Peirce and Buchler (1955) referred to abduction as the nature of scientific progress to find new explanations for phenomena. Timmermans and Tavory (2012, p. 167) define abduction as “a creative inferential process aimed at producing new hypotheses and theories based on surprising research evidence”. It is the general logic of abductive reasoning to turn surprising facts into matters of course (Hanson, 1958, p. 86). While these two definitions indicate that abductive reasoning benefits from both inductive and deductive reasoning, Dubois and Gadde (2002, p. 559) insist that abductive reasoning cannot simply be seen as a mixture of inductive and deductive reasoning. They assert that abductive reasoning is a fruitful approach if a study’s objective is to discover new things—such as other variables and other relationships (Dubois & Gadde, 2002, p. 559). They further emphasise that in abduction an original framework is successively modified which is induced by unexpected empirical findings and new theoretical insights that are gained during the process. This proceeding leads to new combinations being developed through a mixture of established theoretical models and new concepts derived from reality (Dubois & Gadde, 2002, p. 559). Similarly, van Maanen et al. (2007, p. 1149) consider abductive reasoning to be a means of assigning “primacy to the empirical world but in the service of theorising”. They claim that abduction is a process in which “analysis proceeds by the continuous interplay between concepts and data” (van Maanen et al., 2007, p. 1149). By following this process, researchers go back and forth between theory

and empirical discovery, constantly modify their theoretical framework with empirical findings, and at the same time use the refined theoretical framework to guide the ongoing process of case analysis (Dubois & Gadde, 2002, p. 555). This process enables the researcher to test novel ideas and try to make sense of new and unknown situations (Dubois & Gadde, 2002, p. 555).

Given that this study's goal is to derive findings grounded in the data while also keeping within the theoretical framework, the analysis follows an iterative process that is typical of abductive research. The study underlines abductive reasoning by underlining the interplay between the empirical and theoretical parts and including prior knowledge, real-life observations, theory matching, theory suggestions, and conclusions in the abductive reasoning. The goal is to derive findings grounded in the data while also keeping within the theoretical framework (Corbin & Strauss, 1990). There was thus a constant interplay between the empirical part of this study and the theoretical parts of research on BMI and engagement. The contributions of the study are reflected against the literature of BMI, particularly, the method of experimentation, and against engagement behaviours. This was done by iteratively revising and refining the emerging findings both inductively (through data-driven identification) and deductively (through theory-driven identification). Thus, this study applies abductive reasoning as the research approach, which is grounded in the literature on BMI and engagement and consists of empirical data on 19 new ventures in Germany.

4.2 Qualitative-empirical Study

4.2.1 Preparation of the Interviews

Building on the knowledge described in sub-chapters 4.1.1 and 4.1.2, a comprehensive survey was prepared to answer the first and second research question. To this end, an interview guide for semi-structured interviews was developed. The guiding questions were derived from the conceptual considerations (Gläser & Laudel, 2010, pp. 90–93) and from the theoretical research background. The questions all aim to highlight the extent to which experimentation and actor engagement appear in BM design.

In total, questions were asked about four overarching areas. These include background information on the interviewee(s), BMI, thought experimentation, and actor engagement. At the beginning of the interview, questions were asked about the interviewee (their age,

profession, gender, role in the organisation) and about their new venture (name, size, description of the organisation's activities, market/industry). With the help of these data, an overview of each interviewee and their newly founded venture was obtained. Following this section, the interview guide includes questions about the BM and its components, the first business idea, and how this idea evolved. As a reference for the description of the BM and BMI, Osterwalder's (2004) study and his nine empirical building blocks that characterise a BM are used: value proposition, key partners, customer segments, customer relationships, key activities, key resources, channels, revenue streams, and cost structure. The researchers of this study chose to use the Business Model Canvas because it is proposed to help describe and visualise the essential components of a BM and their relationships in a simple way, as indicated by Osterwalder et al. (2005). Further questions addressed when and how the founders began to conceptualise their first BM draft, what form the initial BM took, and how thought experimentation influenced changes in the BM design. The final questions addressed the actors that were possibly involved in the process, how they were involved, and what motivated them to get involved.

The questions related to experimentation and engagement are very broad and asked the interviewees—with the help of different formulations—to account for the elusive constructs. Furthermore, all questions were kept as simple and clear as possible, with care being taken to keep them as open-ended as possible (Gläser & Laudel, 2010, pp. 131–135). The data collection involved an iterative process that allowed issues and questions that emerged organically in earlier interviews to be added to the interview guide as remarks for subsequent interviews. As a result, the interview guide developed and was altered over time as interesting issues and questions emerged and insights were uncovered. It is important to not end up being too theoretically predetermined and thereby narrow the analytical focus and the insights developed in an investigation of this nature (Glaser & Strauss, 1967).

In addition to the logical arrangement of the questions, the structuring of the interview guide according to areas of interest has the advantage that the interviewee's flow of thought is occasionally loosened up (Gläser & Laudel, 2010, pp. 146–148), which helps to interrupt the focus on only one direction in the answers and prevents a halo effect in the responses to other questions (Klößner & Friedrichs, 2014, p. 678). As a result, the interviewees can give their thoughts a new impetus without being too influenced by previous answers. The full semi-structured interview guide is shown in table 13.

Table 13: Interview guide for semi-structured interviews

Area	Guiding questions
Background information on the interviewee	Age, name, profession of the interviewee Title of the interviewee, interviewee's role in the organisation Name of the organisation, size of the organisation Description of the organisation's activities and the industry/market it operates in
BM design	Describe the BM of your firm and the single BM components. <ul style="list-style-type: none"> • What are the main services offered by the firm? • What are the firm's principal resources on which its services are based? • What are the firm's main target groups/customer segments? • What is the firm's pricing model? • What is the firm's financing structure? • In what way is your BM new to the market or industry? • Who are the firm's cooperation/business partners? Describe how your initial BM idea has developed since your venture was established. <ul style="list-style-type: none"> • What BM components (pricing model, target group/customers, suppliers, financing model, business cooperation/partners, value proposition, core activities) have been newly considered? • What benefits have these modifications brought for the venture? • How important were these modifications for the venture? • Have there already been conflicts regarding changes to the BM? What are the plans to develop or modify the BM in the future? <ul style="list-style-type: none"> • Why haven't these components been modified yet? • Who in your company decides whether the BM will be modified?
(Thought) experimentation and learning	Describe decision-making issues in the venture. <ul style="list-style-type: none"> • Which actors are involved in decision-making in the venture? • Which actors influence decisions that are made in the venture? • To what extent do the different actors influence decisions? • How did your involvement in the venture influence the BM and changes to the BM? • Please put yourself in a situation where you have made the wrong decision. How did you react in such a situation? What steps did you take? Describe to what extent you have the openness to learn (e.g., from situations or from other actors) and the willingness to revise your own beliefs. <ul style="list-style-type: none"> • Do you continuously reflect and inspect the present BM? How is this triggered by other actors? • Do you continuously evaluate and justify the present BM? How is this triggered by other actors? • Would you agree to remain open to explore different possible directions before approaching an option? How is this triggered by other actors? Describe the recognition of uncertainties and opportunities. <ul style="list-style-type: none"> • Do you recognise uncertainties in your BM idea and remain sensitive to them during the project? If so, to what extent? How is this triggered by other actors? • Do you recognise opportunities in different situations? How is this triggered by other actors? • Are you considering which new competencies need to be developed to adapt to changing requirements? • Do you suppose/conceive/consider new options and possibilities for how to design your BM? If so, to what extent? How is this triggered by other actors? • Do you investigate your environment to learn about needs and constraints? If so, to what extent? How is this triggered by other actors?

Table 13: Interview guide for semi-structured interviews (continued)

Area	Guiding questions
Actor engagement	<p>Describe which actors have played an active role in the founding process of your venture and in its further development to this day.</p> <ul style="list-style-type: none"> • How did you get to know these actors? • Did the actor approach you or did you approach the actor? • With which persons did they exchange information about the venture and the BM? Why specifically with these people? • How exactly were the actors involved? • What means and resources did the actors provide (e.g. technical, innovative ideas, network)? • What role did the exchange of information and knowledge play? • To what extent were the actors involved in decision-making? • Did the actors question the viability of the BM? <p>Describe how the actors are networked with each other.</p> <ul style="list-style-type: none"> • How are the actors networked with each other? • Do the actors know each other? • Are there certain actors to whom you have deliberately not told anything about your venture? • What actions do they take to maintain the network of actors engaged? • Have you been networked in any way with the research or public institutions? <p>Please describe to what extent the actors have contributed to changes of the BM.</p> <p>Were there conflicts or contradictions between the actors engaged regarding the BM?</p> <p>Describe the motives of the different actors to engage.</p> <ul style="list-style-type: none"> • What motives and goals could the actors have had to take an active role in the venture's BM development?

4.2.2 Data Collection and Sample

The interview sample was compiled based on pre-defined criteria. First, data was only collected through interviews with founders whereby the study retained a focal actor's perspective, i.e., a founder's perspective. To reflect industry variety, the sampling followed the reasoning of Eisenhardt and Graebner (2007) and included a diverse set of cases to provide robust insights for the field of entrepreneurship (Andries et al., 2013; Clarysse et al., 2011). The sampling decision was made to reflect variation in the industries and financial sources (e.g., university spin-outs, corporate ventures, equity financing). In addition, the researchers (i.e., the doctoral candidate of this paper and her team of assistant researchers of the Technical University Kaiserslautern) determined in advance which ventures were actually classified as new ventures. Only those ventures that emerged independently were classified as new ventures, i.e., those that are not spin-outs of established firms. University spin-outs were also included in the sample, as these do not depend on another company's ideas and decisions, but act independently. Furthermore, the target group only included start-ups that had built their BM on a new

technology, product, or idea, with a focus on the venture being innovative. Simple new shop openings were excluded. In addition, the interviewees only included founders that are located in Germany and hence all interviews were conducted in Germany with German nationals in the German language. The use of the researcher's and interviewee's mother tongue ensured that there was no misinterpretation of the content. Another precondition for inclusion in the sample was that the ventures were founded between the years 2015 and 2019, as this ensured that the ventures could be categorised as micro or small companies (0–50 employees) and simultaneously fulfilled the criterion that the interviews be conducted between the first and fifth year after the venture's foundation. Additionally, this ensured that the new ventures were still in their pre-seed phase or had just recently entered the market.

The first potential interview partners were acquired with the help of the foundation office of the Technical University Kaiserslautern. Using their large network, the foundation office approached founders who met all the above criteria of the study. The founders were told that they should contact the main researcher if they were interested in participating in the study. At the same time, start-ups were identified through an internet search on start-up register sites and news articles. If the start-ups met the above criteria, they were contacted by e-mail. The researchers also used their personal network to contact further start-ups.

In total, 19 interviews were conducted by the person who was responsible for the research project, i.e., the doctoral candidate of this paper. On the one hand, this makes sense because the person in charge of the research project has the necessary theoretical background knowledge to be able to work specifically with the flexibility of the guiding questions. On the other hand, this researcher also has the methodological training to conduct the interviews. Both points are considered important in the literature on interviewing relating to the quality of the results (Hopf, 2010, pp. 358–359). The interviews were conducted either as face-to-face interviews at the researcher or the interviewee's office or via a video chat provider (Skype or Zoom). At this point, only the interviewer and the interviewees were present. In addition, the interviews were tape-recorded for later transcription and analysis with the consent of the interviewees.

To start the interview, the interviewer began in general terms with a simple question about the founder's business idea. In so doing, the interviewer not only learned about the business idea in general but also about details on the BM. This question also served as an icebreaker question that can be used to create a simple introduction to the interview situation (Riesmeyer, 2011,

pp. 227–228). After the business idea was clear to both parties, and the interviewer had made initial sheet notes on important points, the interview continued with the leading questions on individual components of the BM. The interviewer allowed the interviewee(s) to talk about this area for as long and in as much detail as was conducive to answering the research question. The interviewer also varied the order of questions and question areas if either the interviewee's answers or the interview process required it. In this way, it was possible to have the research questions answered in a focused and detailed manner.

The founders of 19 ventures agreed to participate in the study. The implementation period of the 19 interviews ran over 2 years, from 2017 to 2019. All interviews were conducted as a conversation between the interviewer and one founder. In two ventures (ventures 1 and 4), two founders agreed to participate in an interview. In addition, the interviewer took care that the interview duration was within or near the range of 30–45 minutes as recommended in the literature (Böhler, 2004, p. 100). The interviews lasted approximately 40 minutes on average and were recorded and transcribed verbatim, except for two sessions in which the interviewees chose not to allow recording. In these cases, the researcher took notes that were transcribed within 24 hours.

Table 14 provides more details on the composition of the interview sample and the average length of the interviews. The quotes in the results in chapter 4.2.4 are attributed to the interviewees references in the first column in table 14.

Table 14: Overview of the key data pertaining to the interviews

Interviewee	Company activity	Categorization of industry	Duration of interview
Founder 1A, Founder 1B	Web-based application with which constructions can be built and managed based on databases	Knowledge-intensive business services	1 hour, 40 min
Founder 2	Professional service provider in innovation protection and management	Knowledge-intensive business services	21 min
Founder 3	Development of a health diagnosis system for cows	High-technology products	23 min
Founder 4A, Founder 4B	Support platform for first-year students with workshops	Services	1 hour, 27 min
Founder 5	Future-oriented engineering office for efficiency increase and more sustainable companies in the energy sector	Knowledge-intensive business services	1 hour, 5 min
Founder 6	Event platform for networking with various locations around the world; program for the advancement of women with training sessions, coaching and self-reflection	Services	53 min
Founder 7	A platform for sales consultants to identify and approach relevant buyers by using their own data bank	Knowledge-intensive business services	39 min
Founder 8	Construction of moving screens for advertisements in pharmacies	Services	38 min
Founder 9	Sale of second-hand fashion and restoration/modification of these garments	Retailing	29 min
Founder 10	A platform for the production, development, and distribution of various equipment for the police and military	Retailing	45 min
Founder 11	Distribution and production of natural cosmetic products with pear wax; management consultancy to combine traditional industries with innovative start-ups	Retailing	25 min
Founder 12	Development of an innovative production technology for the manufacturing of wheels made from fibre plastic composites	High-technology products	1 hour, 2 min
Founder 13	Development and production of a hose management system for different application scenarios	High-technology products	45 min
Founder 14	Facilitated programming of robots for people without programming knowledge	Knowledge-intensive business services	25 min
Founder 15	Versatile transport vehicle with electric drive for various applications	High-technology products	24 min
Founder 16	Programming school for children and young adults	Services	28 min
Founder 17	Development of a digital calendar for podiatry	Services	1 hour, 30 min
Founder 18	Digitalization of psychological test procedures for the acquisition of psychological characteristics of a person	Knowledge-intensive business services	50 min
Founder 19	Smart city concept using the combination of bio, construction, and tech to enable the development of disruptive vertical greenery	High-technology products	1 hour, 10 min

In summary, the interviews resulted in 919 minutes of audio material, which was transcribed (including handwritten notes) into 214 pages of text material. To keep the transcriptions consistent and complete, the transcription team followed specific rules (Dresing & Pehl, 2015, pp. 21–22; Pfisterer, 2016, p. 151; Welling et al., 2015, p. 329), which are presented in table 15. Despite the literal transcription, the transcribers ensured as far as possible that word breaks, repetitions, simultaneous speech, or stuttering were smoothed out in favour of readability. Dialects were transferred into High German as far as possible.

Table 15: Transcription rules

Transcription rules	Explanation
L	Beginning of an overlap; simultaneous speaking of two interview participants; direct connection at a change of speaker
Text/	Sentence break, half sentence
(3)	Three seconds pause/Long pause
(.)	Short break or weaning
Text::	Word twisting
@(3)@	Three seconds of laughter/Long laughter
@(.)@	Short laugh
@(Text)@	Text laughingly spoken
(.....)	Incomprehensible audio passage, length corresponds to approximate number of points
(Text, unverständlich, Grund)	Assumed statement, reason for lack of understanding
TEXT	Emphasis
[Text]	Transcriber's note for better understanding; Meaningful addition
[...]	Omission of the transcriber for better understanding

The analysis of the transcription text was carried out with abductive reasoning logic. The analysis process and results are presented below.

4.2.3 Data Analysis

The goal of this study was to derive findings grounded in the data while also adhering to the theoretical considerations (Corbin & Strauss, 1990). Therefore, this study followed the principles of abductive reasoning (Dubois & Gadde, 2002) in the analysis. Reichertz (2004) emphasises the innovative nature of the abductive approach, as it brings together concepts that have not been associated with each other before, such as the interplay of the three main constructs that are BM design, thought experimentation, and voluntary actor engagement in this study. This was done by revising and iteratively refining emerging findings both inductively

(through data-driven identification) and deductively (through theory-driven identification informed by the existing literature).

In the analysis, the researchers followed the suggestion of Moustakas (1994) to first become familiar with the data and then discard irrelevant material to focus on what appear to be the key events that are deemed important. Afterwards, the data analysis was conducted by searching for characteristics of the main constructs, e.g., in the form of changes to the BM, uncertainties, voluntary activities, or integrated resources. On the one hand, the coding procedure followed Gioia et al.'s (2013) methodology and the data was inductively coded. Two researchers, namely the researcher responsible for the study and one student assistant researcher, read the transcribed interviews line by line to identify any reference to (thought) experimentation or engagement behaviours (first and second research question). Computer-aided data analysis utilising Atlas.ti was employed for open coding because of the large amount of transcribed interview material and to enable detailed and structured analysis, including in-vivo coding, and the identification of theoretical categories (Bazeley & Jackson, 2007). In addition, Atlas.ti enabled the researchers to record comments and thoughts about emerging themes. This process resulted in an extensive list of recurring themes concerning changes to BM components, experimentation, and positive and negative actor engagement activities. On the other hand, a template with a-priori themes that were identified in advance out of existing research was used to code the data. These a-priori codes are directly linked to already existing findings and frameworks from experimentation and engagement literature, e.g., engagement through “mobilising behaviour” (Alexander et al., 2018; Jaakkola & Alexander, 2014) or “purposeful interactions” (Bojovic et al., 2018). These codes served as additional codes to the newly identified themes, e.g., “sharing of information” or “providing infrastructure”. In total, over 200 codes were defined. A total of 674 passages were extracted from the 214 pages of transcription material, in which the interviewees expressed themselves in terms of actors' behaviours, activities, attributes, or integrated resources.

In the next step of the analysis, initial themes were grouped and developed into thematic categories, e.g., the three themes “advisory activity”, “providing expertise”, and “passing on expertise to a certain industry” were combined into the category “teaching behaviour”. This first category system was only based on the first 10 interviews. Each author first categorised the data independently, and afterwards, the categories were compared, discussed, and assessed for differences and similarities relating to engagement behaviours, integrated resources, and

thought experimentation forms. This procedure involved considerable revisions to the initial categories in terms of narrowing, relabelling, and integrating overlapping categories. The final category system was then applied to the last nine interviews and the data of the first 10 interviews was revised if necessary. The final categories include three categories (forms) for thought experimentation and six categories (roles) of engagement behaviours, which will be detailed in the results.

In the last step, the data was analysed according to a BM timeline, following the generalisable and normative model of the BMI process by Wirtz and Thomas (2014) and Wirtz and Daiser (2018). For this purpose, a code co-occurrence table was set up, which displays the frequencies of co-occurrences of codes in the form of a matrix, similar to a correlation matrix. Two axes were used, which include the process stages by Wirtz and Thomas (2014) and Wirtz and Daiser (2018) on the first axis and the forms of experimentation, respectively the roles of engagement, on the second axis.

The reliability of the findings was enhanced by carefully describing the data collection procedure and providing a rich set of quotations from the data to illustrate and support the key findings (Healy & Perry, 2000). Furthermore, two independent coders were involved whose analyses were compared to improve the accuracy of the developed categories. The use of the computer-aided analysis tool Atlas.ti also improved the formation and development of the categories, enabling systematic sorting and searching to find common features and patterns in the data (Kelle, 2004).

The validity of the findings is enhanced by ensuring that the data was obtained from appropriate sources, i.e., by carefully selecting interview partners (Healy & Perry, 2000). Furthermore, researcher triangulation was given as two researchers participated in the data coding and categorisation. In addition, external validity, i.e., the transferability of the findings, was enhanced by using interviewees from different industries and types of firms (see table 14) within a carefully defined study context and by using theory and previous studies to guide the analysis.

4.2.4 Results

In all interviews, the founders mentioned certain problems that occurred during the time they began to transform their first idea of a business into a real BM. The reasons for this included financial burden, uncertainties, or a lack of business knowledge. In addition, the founders were confronted with many issues. Some key issues included how to establish a viable BM and fruitful relationships with partners and/or customers, how to earn money with the business idea, and how to proceed or not to proceed with the BM. Evidence was provided in all interviews to support that a new BM must somehow be adapted during the pre-seed phase, whereby the entrepreneurs deliberated about different ways to design their BM. They especially pondered and evaluated options concerning the design of single BM elements, e.g., on their pricing model. To obtain valuable feedback and advice during this stage, the entrepreneurs consciously or even unconsciously interacted with their immediate environment (e.g., with experts, competitors, public institutions, and research institutions). These psychological and exchange-based processes of the entrepreneurs are to be classified as forms of thought experimentation in the following. To give a better insight into how exactly different behaviours or thoughts are reflected in experimentation, the individual forms are subsequently explained in detail and hence the following section is organised as a narrative to reflect the analytical process explaining how and in which forms thought experimentation appears in the early pre-seed phase of BM design. In a second step, it is specified how actors interact and thereby engage in thought experimentation and what resources they integrate, designated as roles of engagement behaviour. It will also be shown how these roles support and advance the different forms of thought experimentation.

4.2.4.1 Forms of Thought Experimentation

Three themes emerged from the data outlining three distinct forms of thought experimentation that are specifically tailored to the context of the pre-seed phase: *purposeful interactions*, *incidental interactions*, and *theorising*. The three forms, including brief explanations, are illustrated in figure 7, while table 16 presents illustrative corresponding evidence in the form of quotes taken from interview excerpts.

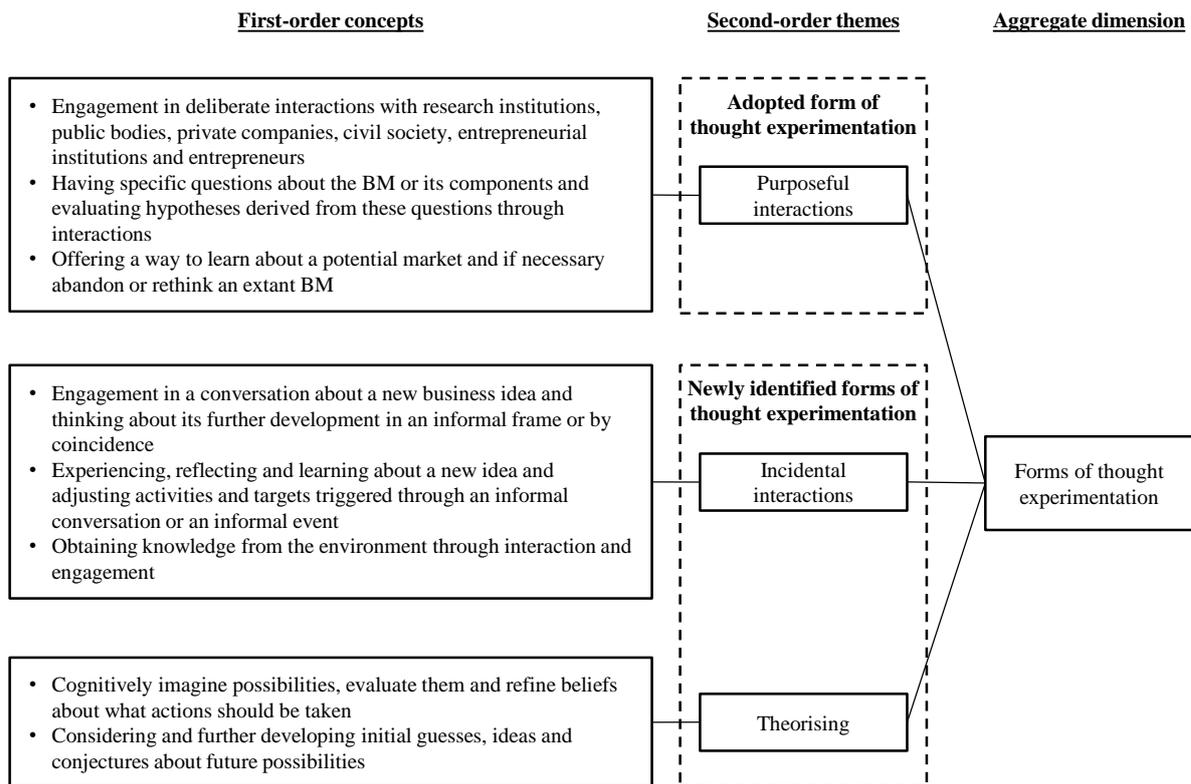


Figure 7: Data structure for forms of thought experimentation

Table 16: Illustrative evidence for forms of thought experimentation

Theme	Exemplary quotes from the interviews
Purposeful interaction	<p>“We tried to talk to a lot of people in the network, in the university, at university events, where we got feedback. This was not about serious decisions, but in any case, smaller pushes in one direction or another.” (Founder 3)</p> <p>“We questioned everything, of course, often and constantly.... I also tried early on to find experts from the agricultural sector, so from my industry.” (Founder 5)</p> <p>“For example, my roommate, I also presented the concept to her and asked for her opinion. It was mainly about whether she think [sic] it’s good or bad.” (Founder 6B)</p> <p>“The people from the founding office, they were giving advice, I always called them, and then we talked about it like ‘can we do this, can we not do this? How would you proceed? Should we invest now, should we not invest? Should I step into this research project, should I not go into it? Is it too much work? Is it even lucrative?’” (Founder 7)</p> <p>“Of course, there are also various founder events at universities where you simply go as a lecturer and stay a little longer to talk to the people afterwards.” (Founder 7)</p>
Incidental interactions	<p>“I find that ecosystems differ from city to city. Some ecosystems are very uninviting I would almost say. Or with a lot of competition. It depends on the personalities and the start-ups engaged, who are influencing [sic] the kind of culture that prevails there.” (Founder 6)</p> <p>“For a while, we had the idea [of the pricing model] to make money with two sides, that is from the agent as well as from the direct customer. We just tried it. Then we got the hint that the BM would not be accepted this way by agents as well as [sic] by customers.” (Founder 7)</p> <p>“I think what is important is to have different people who can illuminate different points of view. And then you have to see for yourself what works best for you and the objective you want to achieve.” (Founder 8)</p> <p>“Conflicts or discussions can really be ground breaking and you can learn something about yourself or maybe even get out of your own mind when you realise it makes total sense what the other person is saying.” (Founder 8)</p> <p>“All critical questions were always in the commercial direction because they were all (or mainly) people with little commercial experience. ‘Have you considered this’ or ‘how do you want to approach this customer?’” (Founder 14)</p> <p>“Then you talk to a company who [sic] tells you about your possibilities... There are so many possibilities. And so far, I have absolutely no idea which way it will go. I am open for everything”. (Founder 15)</p>
Theorising	<p>“That is the question of how to proceed in general, whether this is right or not, I’m never sure.” (Founder 1A)</p> <p>“I believe [theorising] applies in all areas for all BMs, that you have to question them again and again and see how to adapt individual components. [...] We have already had this several times, that we have modified our approaches of what we actually want to sell.” (Founder 2)</p> <p>“We have developed the product and service over time. We have made the BM more precise. For example, we thought about the extent to which we really want to do direct sales. In principle, we have specified everything over time.” (Founder 5)</p> <p>“Additional ideas are always taken up. How quickly these ideas are implemented depends on available resources. Because we are completely self-financed [...] we have little money to spend on additional resources. And that’s why we don’t have enough time to implement these new ideas. But in principle, the ideas are taken up and remembered.” (Founder 7)</p> <p>“Well, I think that we, in principle, are among those who constantly question the BM.” (Founder 9)</p> <p>“As far as the BM is concerned, I myself am curious how the whole thing will develop and what it will look like in the end. I do not know that at all yet. But it is very exciting. I mean, in such an early phase of a company you might just have to be open-minded and wait and see what happens. There is no other way to plan it.” (Founder 15)</p>

The first form of thought experimentation identified is *purposeful interactions*. This form is adopted from existing research (Bojovic et al., 2018; Murray & Tripsas, 2004). Murray and Tripsas (2004, p. 70) defined purposeful experimentation as “[a] firm’s [engagement] in clearly articulated problem-solving, based on the identification of a problem or decision, the establishment of a hypothesis, and the testing of that hypothesis through organisational activity”. Similarly, Bojovic et al. (2018, pp. 142–143) explain that purposeful interactions describe interactions with customers, partners, experts, and other external actors by formulating questions about a BM and testing one or more BM components derived from these questions. In accordance with these definitions of purposeful experimentation, this study’s findings acknowledged the importance of purposeful interactions in the context of BM design, in that different actors consciously seek interaction with other actors, to discuss potential changes of a predefined BM. Purposeful interactions take place between different parties, e.g., research facilities, public institutions, entrepreneurial firms, industry/market experts, or family members. In this vein, entrepreneurs listed specific questions and aimed to evaluate and experiment with specific facets of their BM: the technology or product and its value add, the value it could create for customers or the target group, monetisation and financing issues, pricing systems in which no standardised system existed yet in the market/industry, or the establishment of cooperation/partnerships with other parties in the industry because of high competition. Hence, on the one hand, entrepreneurs are seeking for advice through purposeful interactions, while on the other hand, external actors to the venture, e.g., research institutions, are seeking to give valuable feedback to entrepreneurs.

Although it was initially assumed that purposeful interactions are mainly initiated by the entrepreneurs themselves, evidence was found that these interactions are often guided by other actors, e.g., experts or mentors. These actors continuously question a BM and actively seek out conversations. Thus, purposeful interactions are initiated by multiple actors, including university professors, potential customers, suppliers, and competitors. Furthermore, the findings showed that purposeful interactions are positively and negatively valenced although the researchers did not expect negatively valenced interactions because negative effects have not yet been clearly addressed in the literature. However, three interviewees reported that they interacted with public or research institutions that could only provide superficial feedback, which resulted in frustration and a lack of clarity for the entrepreneurs. This is due to the problem of missing guidelines for start-ups on who they can specifically contact at the local

level when having questions. As a result, start-ups repeatedly end up in the same institutions that lack expertise, especially in specific industries/markets. This finding is supported by Alcalde and Guerrero (2016, p. 407) who argue that the knowledge gap (e.g., of technologies) between research organisations and firms drives firms to spend much time and money on communication and integration in the collaboration process, thereby diminishing innovative market opportunities.

The second form of thought experimentation that was identified is *incidental interactions*. Incidental interactions describe how actors act by coincidence and identify not-yet-evaluated but promising options, with which they can experiment. Contrary to purposeful interactions, incidental interactions are not targeted to a specific goal or question; they arise from an unplanned situation, such as an unplanned conversation or encounter at an event. The new information and knowledge that is gathered through incidental interaction, e.g., unexpected ideas, can lead to rapid changes to a BM. The results showed that incidental interactions are triggered by discrepancies or uncertainties regarding the BM design that the entrepreneurs are initially not aware of. In this way, BM elements are revised, although an actual final version of the BM might already be in existence. For example, one founder had decided on a pricing model, yet the founder was uncertain about whether he made the right decision on that model. Consequently, he was very likely to be influenced by external actors' opinions and feedback, and as a result, he revised his pricing model (see comments provided by Founder 7 in table 16). Further results showed that incidental interactions are limited due to certain circumstances that are predefined by the entrepreneurs, e.g., the results indicated that they depend on the overall willingness of the entrepreneurs to get involved in interactions. The data of five of the interviews highlighted that if focal actors show an overall moderate interest in interacting with their environment, relatively little time is left for incidental interactions. Founder 9 explained that his venture is striving for rapid growth and does not seek out any interruptions, not only because it is self-financed but also because the objective is to enter the market in a minimal amount of time. Given these circumstances, the founder is not very interested in sharing the BM idea with actors external to his venture. As a concluding remark, experimentation very much depends on the attitude and willingness of the focal actors to engage in exchange relationships with other parties. The missing willingness to interact with others can be explained by time or monetary constraints or by the aim of not being outpaced or harmed by competitors.

The data also revealed that incidental interactions can be limited by the dynamics and the culture of local networks. Interactions that led to experimentation outside of a local network were only visible in the form of purposeful interactions. As a remark, entrepreneurs must try to profit from good local structures to establish close relationships, although they might also exert negative influences (see comments provided by Founder 6 in table 16). Accordingly, the attractiveness or unattractiveness of local structures influences how and to what extent new ventures act in experimentation processes. This is hardly surprising, as young ventures have only a few opportunities to operate outside their local network due to a lack of time and money.

Another challenge for entrepreneurs is to interact with many different actors at the same time, all of whom have different options, evaluations, and suggestions. Entrepreneurs must thus determine what is relevant and what is irrelevant for the further development of their BM. This holds true for both incidental and purposeful interactions. Most of the focal actors' organisations indicated that finding and choosing the right path is hardly possible on their own, as most of them do not have the necessary experience and expertise. However, they can benefit from experimentation processes if they clearly articulate their point of view, their interests, and their knowledge.

The third form of thought experimentation is *theorising*, which entails imagining options, evaluating these options, and refining beliefs. It is not an interaction; rather, theorising is a cognitive construct that describes how actors consider initial ideas and suggestions and think about future modifications to a BM. The interview data provide evidence showing that mainly the entrepreneurs themselves kept questioning their BM, theorised about what kind of value it could create for different parties, and iteratively modified the BM, i.e., cognitively adapting single BM components, such as evaluating which pricing model is the most appropriate. Theorising is an ongoing mental process that occurs at any time in the pre-seed phase. It can lead to action or reaction, yet it can also be restricted depending on factors such as time constraints and available resources in the entrepreneurial process (see comments provided by Founder 7 in table 16).

Furthermore, it is assumed that all three forms of thought experimentation are mutually dependent, as experimentation is assessed as a dynamic, iterative process. More precisely, it is assumed that theorising results in interactions and, vice versa, interactions also lead to further theorising. When analysing the data according to the BM process stages by Wirtz and Thomas

(2014) and Wirtz and Daiser (2018), the results confirmed this assumption. Theorising predominantly happens in the early stages of the pre-seed phase, during the stages of analysis, ideation, feasibility, and prototyping. In contrast, incidental and purposeful interactions appeared throughout the whole pre-seed phase during all stages, although predominantly during prototyping and decision-making. Only two interviewees confirmed incidental and purposeful interactions in the analysis stage. The interviews demonstrated that theorising can lead to purposeful interactions when founders evaluate BM options and find that they do not have the necessary expertise and knowledge to choose the right option. Hence, the founders systematically search for assistance. The interviews also showed that incidental interactions lead to purposeful interactions when an unplanned conversation between two or more actors leads to one of the actors becoming aware of an institution they should get into contact with. The converse also applies, i.e., if an entrepreneur encounters new people through an official invitation to a planned event.

4.2.4.2 Roles of Actor Engagement Behaviour

The results revealed how entrepreneurs themselves and actors external to new ventures support and act in thought experimentation in the form of purposeful and incidental interactions and theorising. These actions of actors and interactions between actors can be described more precisely with the help of the construct of actor engagement. Actors who engage in thought experimentation processes support, promote, stimulate, and encourage the three forms of thought experimentation that lead to a BM being questioned and possibly changed. In thought experimentation processes, actors show different behaviours that are all voluntarily performed. To better understand these voluntary engagement behaviours, they will be examined in detail in the following. The study's results reveal six roles of engagement behaviour, including *teaching*, *supporting*, *mobilising*, *co-developing*, *sharing*, and *signalling*. Figure 8 presents the data structure and emerging themes for the engagement roles, while table 17 lists representative quotes as supporting evidence of the coding.

Figure 8: Data structure for roles of engagement behaviour

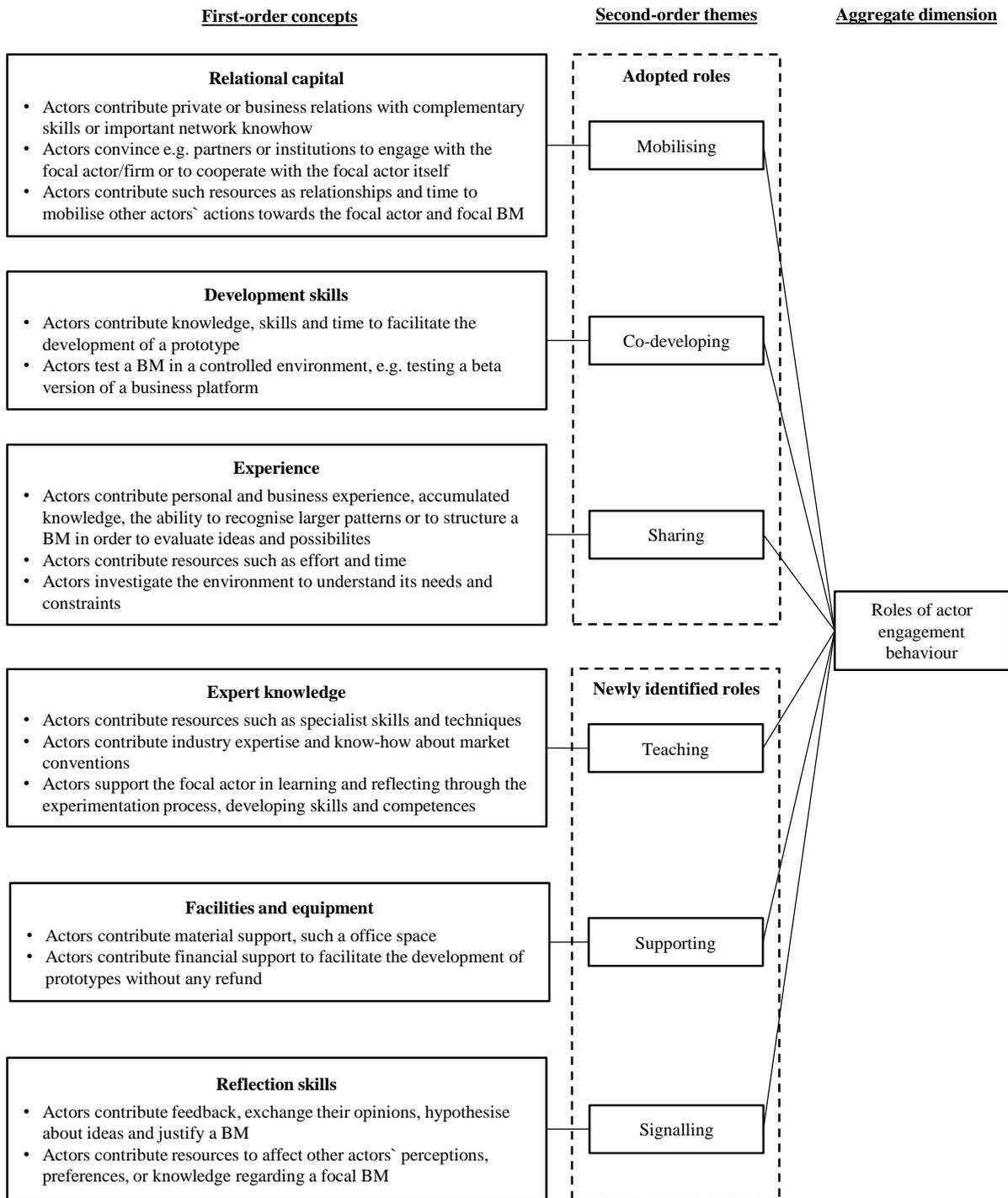


Table 17: Illustrative evidence for roles of engagement behaviour

Theme	Exemplary quotes from the interviews
Teaching	<p>“In principle, I simply asked other customers, or even suppliers, stupid questions, for example, ‘How did you do that?’ They always gave feedback.” (Founder 12)</p> <p>“When someone is looking for money, then the individual discussions with business angels and investors very often shape the BM in the early phase, because you simply know what is important and actually matters based on their questions.” (Founder 13)</p> <p>“When choosing for [sic] a strategy we might pursue, I don’t presume to have great expertise to decide by myself, so I am of course open to ideas. If someone with expertise tells me how he would do it, then we’ll consider this.” (Founder 14)</p> <p>“Of course, it was also important for me to say ‘I’ll show it to the professors at my university and to the competence field managers’. So, show it to people with a lot of experience and ask them about their spontaneous idea for this concept.” (Founder 17)</p>
Supporting	<p>“He makes his office or the room available, takes his time, doesn’t get any money either, because he thinks the idea is so good.” (Founder 1A)</p> <p>“With the two pilot customers we had from the beginning, we knew that the sales potential was very low overall. But for a start-up that must test and establish the processes first, perhaps quite charming. Because there’s no customer who says we need 20 units per week and we’ll get it in the neck if things don’t go well. Instead, we dynamically decide to first do one part per week and then sometimes nothing for 3 weeks, and then there are one or two more parts. That’s not so bad in the beginning, to have at least [sic] a basis.” (Founder 14)</p> <p>“There’s a lot of input coming from this supplier. When I say I have problems, ... and I don’t know of anybody else providing a solution in only one day or two... That also refers to the financial aspects ... I only have to pay them for their support, when or if I have sold one product in the future.” (Founder 15)</p>
Mobilising	<p>“We want to start a cooperation with another start-up because our concepts fit well together. Of course, this contact was established through another contact. Most contacts are made through our own private contacts who then pass you to other persons and ... this goes on and on.” (Founder 6B)</p> <p>“My personal network, which has grown over the years through my part-time work, is much [sic] promising. I know people I can mobilise again and again. Where I can ask: do you have another idea, do you know someone?” (Founder 12)</p> <p>“I have a very strong network and I talk about my projects constantly [sic] with many people.” (Founder 13)</p>
Co-developing	<p>“The farm has allowed us to test for a year and a half. Before it’s always been a bit of a problem that we could not test without having cows.” (Founder 5)</p> <p>“I am always open-minded to further develop products together with a potential customer. The willingness to do so is something that always makes the BM itself a bit more dynamic.” (Founder 12)</p> <p>“A guy from a marketing agency told me that he thought we had a great idea. He wants to support it. For example, he could provide a corporate design and a few things like that and if I have any marketing questions, I can ask him.” (Founder 12)</p> <p>“A development partnership is already planned. The details haven’t been fully decided yet, but it is already a partnership where we say, ‘We’ll develop a product together’.” (Founder 14)</p>
Sharing	<p>“We have noticed that our experiences coincided, both in the office and in teaching. That’s why we said ‘we have to change that somehow’ and take it to a new level, to make life easier for students and young architects.” (Founder 1A)</p> <p>“You watch YouTube videos of people who have done something like this before or you go to events just like founder meetings or something like that where there are people from whose experience you can benefit.” (Founder 7)</p> <p>“The biggest advantage of the start-up hub for us personally was that we found people along the way who work in such an entrepreneurial context or in a corporation and we could say ‘hey what does it look like, can you tell us your experience?’ You simply had completely different contact persons.” (Founder 19)</p>

Table 17: Illustrative evidence for roles of engagement behaviour (continued)

Theme	Exemplary quotes from the interviews
Signalling	<p>“We got most of the feedback from friends and acquaintances who talked with us about the idea in general—and introduced the basic concept.” (Founder 1A)</p> <p>“He had understood our business idea right from the beginning ... he very quickly mentioned points that could take us further, for example, with regard to the BM and what else is behind it.” (Founder 1A)</p> <p>“We called potential customers, so to speak within the framework of our current job and told them ‘We have an idea. Can you spare 10 minutes for me to introduce it to you?’ We posed it as a sign of trust that we revealed our idea. And we said that maybe we’ll change jobs and come up with a new business. Without any problems we got the information we needed.” (Founder 9)</p> <p>“Clearly you cannot argue out every decision to the end with everyone, but when it comes to big strategic and directional decisions, I try to get a relatively large environment or large spectrum of input.” (Founder 10)</p>

Teaching is specified as actors’ contributions of resources, such as specialist skills and techniques as well as industry expertise and know-how. Teaching behaviour does not refer to all behaviours that include passing on knowledge or skills, but only refers to those resource contributions that are associated with specialist knowledge and expertise. Actors offer support in developing competences and skills and in learning and reflecting the BM design, as entrepreneurs are not always aware of the possibilities and options from which they can choose. This includes discussions between entrepreneurs and public entrepreneurial organisations, research institutions, or investors who contribute technological, network, and business expertise. Even though teaching behaviour supports theorising, the results showed three to four times as much evidence for how it supported purposeful and incidental interactions. This incidence can be explained by the fact that purposeful and incidental interactions are mainly found in the prototyping and decision-making stages. In these stages, the focus is less on observations and collecting ideas, but rather on decisions that are made about the actual design of individual BM components whereby entrepreneurs are highly dependent on expert advice. Moreover, teaching behaviour was predominantly observed through the input of private companies or private persons.

The second role is *supporting*, which is specified as actors’ contributions of material support such as office space or financial support to facilitate the development of a prototype. Supporting only relates to behaviours that are provided without demands for any kind of return, e.g., a payment. For example, Founder 1A mentioned one actor of a local public institution who made an office available without requesting any compensation. The founder explained that this person simply liked their business idea and did not want any money in return. This situation is similar to that of joint innovation projects between customers and firms, in which interactions,

thoughts, and enthusiasm for the innovation ideally coalesce (Kleinaltenkamp et al., 2019). Engagement in an innovation project or process can be motivated by a common goal towards which the actors align their resources and competences (Linnarson, 2005; Mora-Valentin et al., 2004). The motives for actors to engage voluntarily through supporting behaviour also depend on a common goal as well as enthusiasm, empathy, and passion for a business idea and entrepreneurship in general. Supporting behaviour is almost exclusively promoted by public bodies, research institutions, and private companies and persons.

The third role of engagement is *mobilising*, which is specified as actors' contributions to private or business relationships and of time to mobilise other actors' actions. Mobilising behaviour can be directly connected to facets found in previous research on engagement behaviours (Jaakkola & Alexander, 2014). The term *mobilisation* describes how firms use and reconfigure relationships with other actors to connect resources (Chou & Zolkiewski, 2012). It is closely linked to networking behaviour, which is assessed as a social activity over and above the normal economic trading relationship (Chell & Baines, 2000, p. 196). Mobilising describes how actors convince other parties, e.g., institutions, suppliers, or experts, to engage with the founders of a new venture. The objective is to further expand a new venture's network and to include more actors that are willing to take part in the BM design process. This is in line with the concept of collaborative entrepreneurship that adheres to the idea of designing a new BM based on jointly generated ideas that emerge from the sharing of information and knowledge among actors (Miles et al., 2006). For example, through purposeful interactions, focal actors get invited to fairs, workshops, or special start-up events where they can meet private companies, potential customers, or investors. Similar to supporting behaviour, mobilising is predominantly found among private companies and persons, public bodies, and research institutions.

The fourth role is *co-developing*, which is specified as actors' contribution of knowledge, skills, and time to facilitate the development of a prototype or to create a beta test version of a platform in a controlled simulated environment. Like mobilising behaviour, co-developing behaviour can be directly connected to previous research on engagement behaviours (Alexander et al., 2018; Brodie et al., 2013; Jaakkola & Alexander, 2014). Through co-developing behaviour, potential customers and experts help a new venture to adjust its offerings to better fit potential needs and the specific context, e.g., Founder 5 mentioned a marketing expert who voluntarily (i.e., free of charge and of his own initiative) prepared a corporate design for the venture. Co-

developing behaviour is mainly driven by the ideas of other entrepreneurs or private companies and persons.

The fifth role that was identified is *sharing*, which is specified as actors' contribution of experience with and knowledge about BMs, BM components, entrepreneurship, and business knowledge in general. Actors contribute time and effort and add to discussions by sharing past and personal experiences. They help to observe the immediate environment to understand its needs and constraints, compare these observations with past experiences, and share their perceptions. Sharing behaviour can be linked to the discussion on sharing as an engagement sub-process (Brodie et al., 2013). Brodie et al. (2013) describe *sharing* as the sharing of personally relevant information, knowledge, and experience, although the authors specifically focus on engagement in virtual brand communities. Moreover, sharing can be linked to the discussion on influencing behaviour by Jaakkola and Alexander (2014), who describe how actors use their knowledge and experience to affect others' awareness and perceptions. However, in the context of BM design, it must be differentiated between influencing behaviour that is based on actual past or personal experiences with BM design and influencing behaviour that is built on incidental thoughts, which are classified as the signalling behaviour discussed later on. For example, Founder 19 and his team colleagues had already discussed alternatives to structure their pricing model and proposed different ways based on their own experiences. Their indecision regarding which pricing model to choose led them to exchange their ideas with other start-ups as they face similar problems. Sharing became visible in all groups of actors, including civil society such as friends, family or colleagues, entrepreneurial enterprises, private companies, public bodies, and research institutions.

The last role is *signalling*, which is specified as actors' contributions of resources such as incidental and general feedback and exchange of options and thoughts. Signalling behaviour influences a BM design more indirectly, since actors, due to a lack of expertise or experience with BMs, merely express their personal opinion. Thus, the entrepreneur's perceptions, preferences, and knowledge regarding a focal BM are affected. Because personal opinions are exchanged, the private environment plays an important role in signalling behaviour. This can be explained by a friendship that is based on the common experience and history of individuals and is needed to collaborate successfully (Harrison et al., 1996). Signalling was only regarded as a positive behaviour, primarily in the form of positive feedback. Like sharing behaviour,

signalling behaviour became visible in all groups of actors, although it was found twice as often among members of civil society.

When analysing the six engagement behaviours in relation to the design process stages of Wirtz and Thomas (2014) and Wirtz and Daiser (2018), certain differences were found. Evidence of all behaviours was most notably given in relation to the two stages of prototyping and decision-making. In these two stages, all six engagement roles were coded numerous across all interviews. During prototyping, great importance is attached to specialist knowledge and the creation and use of networks and relationships. Subsequently, during decision-making, customers, suppliers, and further actors come into play to finalise the BM. In contrast, in the earlier stages of analysis, ideation, and feasibility, sharing, and signalling behaviours were primarily found. Following this, actual past experiences and personal perceptions mostly influence the starting point of designing a new BM, whereas network structures become more important when decisions must be made on how to shape the actual BM components. In the last stage, implementation, supporting, and mobilising behaviours are found three to four times as often as the other behaviours. As an explanation, support in the form of money, office space, and prototype development primarily becomes necessary when entering a market.

4.2.5 Discussion of the Results

Theoretical implications

This study enriches the literature on BM design in new ventures (Snihur & Zott, 2020), thought experimentation (Felin & Zenger, 2009), and actor engagement (Brodie et al., 2019). The findings illustrate how a business idea is shaped into a concrete BM with a focus on the pre-seed phase. Thought experimentation appears in the pre-seed phase of BM design by the interplay of three different forms (purposeful interactions, incidental interactions, and theorising). Experimentation is a way to validate a new BM externally and demonstrate its robustness, which results in modifying, abandoning, or recreating components of a BM (Bojovic et al., 2018). The findings highlight the fact that thought experimentation depends on how the founders of a venture connect with their environment and, most importantly, with their surrounding actors. In other words, actor engagement stimulates thought experimentation, on the one hand through interactions between actors, and on the other hand by the fact that actors stimulate entrepreneurs to theorise about a BM and the design of its components. Actors hereby

integrate different resources, including expert knowledge, facilities and equipment, relational capital, development skills, experience, and reflection skills. In support of this finding, Wirtz and Daiser (2018) maintain that activities or behaviours in a focal firm's BM unfold through the integration of human, physical, and/or capital resources. Likewise, Frow et al. (2015) state that innovations are potential outcomes of behaviours and interactions of actors and organisations. Entrepreneurs must be aware that they consistently go through a process of thought experimentation and that this process can be promoted or supported by interacting with multiple actors that are external to the venture. This helps the entrepreneurs to understand how to actively change and further develop a BM when they are stuck, and exploit knowledge, technology, or ideas created by actors external to the venture (Lindholm-Dahlstrand et al., 2019).

The study also contributes to entrepreneurship literature by highlighting that, in accordance with Felin and Zenger (2009), a new perspective must be imposed on experimentation by conceptualising it as a state of cognition. Previous literature focused on experimentation as experimental projects on the market (i.e., actually testing new BMs on the market) (Hassi & Rekonen, 2018; McGrath, 2010). Although the study's findings emphasise that experimentation must not only be acknowledged as a superordinate construct, it has to be recognised from a more profound level of analysis in which different characteristic forms are revealed in terms of interactions and theorising. Felin and Zenger (2009) describe thought experimentation as cognitively and continuously changing and questioning a BM idea, designing new business plans, discarding old ones, and considering new options to redesign components of a BM. This study enriches their findings by identifying three forms of thought experimentation. In this connection, the study shows that experimentation includes intervening (Hacking, 1983); that is, the environment intervenes in experimentation as a thought construct, challenging the BM's components and trying to gain knowledge about its viability. In addition, the findings highlight that thought experimentation already takes place in the pre-seed phase of BM design.

To marketing literature, the study contributes by conceptualising actor engagement as actors' behaviours that influence if and how thought experimentation appears in the process of BM design. Innovation systems research emphasises that entrepreneurial experimentation takes place through interactions among established firms, universities, and new technology-based firms (Lindholm-Dahlstrand et al., 2019). This aspect is acknowledged by this study, in that it conceptualises the interplay of actor engagement and thought experimentation. The emergence

of actor engagement can be explained by social network theory, which describes how individuals are interlinked in social networks or through social ties (Tsai & Ghoshal, 1998, p. 473). Therefore, the discussion on actor engagement is transferred to an under-explored research field and new environment in which it unfolds different, newly informed behaviours. To our knowledge, this article marks the first attempt to conceptualise and empirically document the connection between BM design and actor engagement in the pre-seed phase of BM design. Thus, this study affiliates itself with previous research that has proposed different types of engagement behaviours in diverse contexts (Brodie et al., 2013; Jaakkola & Alexander, 2014). Significantly, this study uncovers six roles of engagement behaviour and provides empirically induced explanations of these roles, also capturing behavioural manifestations that have previously been indicated in the literature (Alexander et al., 2018; Brodie et al., 2013; Jaakkola & Alexander, 2014). Accordingly, this study recognises and adopts mobilising, co-developing, and sharing behaviours (Alexander et al., 2018; Brodie et al., 2013; Jaakkola & Alexander, 2014). Furthermore, it is highlighted that in addition to relational capital and development skills, actors also contribute expert knowledge, reflection skills, and facilities and equipment in the context of BM design. The results make a point that engagement behaviours cannot simply be generalised but must be considered individually for each context.

Limitations

The research choices made in this study also resulted in some limitations. The study only focused on entrepreneurs located in Germany, and more research needs to be done with a larger sample and in exploring thought experimentation and engagement according to different industries and different countries. This study's sample was not larger because of two reasons. First, the total pool of start-ups in German-speaking countries is limited because not all start-ups are widely covered in the press. Second, the contacted start-ups hesitated to participate in the study because they did not want to give out data for fear of being copied by competitors. Third, the founders admitted that there is an increasing research interest in the development of start-ups and that, because of a lack of time to do all they need to do, they cannot invest much time to help researchers.

Regarding the research setting, this study relied on in-depth interviews with key informants that are almost exclusively entrepreneurs. Future studies may seek to collect more data from other actors, e.g., partners, customers, and investors as the entrepreneurs' perceptions are not

necessarily equivalent to those of external actors. Such interviews might allow researchers to look at the other dimensions of engagement, i.e., the roles of cognitive and emotional engagement alongside the behavioural dimension. A consideration of emotions in engagement may help to explain what stimulates and hinders an individual's engagement to become part of BM design. Access to such sensitive data should best be obtained through long-term case studies. However, researchers must note that new ventures that are not yet established on the market are often not prepared to disclose this sensitive data to the public.

Moreover, this study focused on thought experimentation as a single method of BM design. However, because innovation processes involve multiple, sometimes contrasting mechanisms (Berends et al., 2016), it is necessary to investigate what other methods arise in the pre-seed phase and the extent to which they are determined by actor engagement. Further studies should assess the effect of actor engagement on the success of a new venture, which might depend on the scope of thought experimentation and the appearance of engagement. Accordingly, another question to be answered in the follow-up is how the forms of thought experimentation and the roles of engagement behaviour affect the performance of a new venture. In this study, the researchers did not collect information about the final BMs of the start-ups, i.e., the development of the ventures beyond the pre-seed phase. Thus, it is unclear, if and under which circumstances thought experimentation and engagement behaviours have a positive or negative effect on the performance and competitiveness of a venture.

It is also asserted that actors' engagement may vary over time. Some actors may drop out and others may join the entrepreneurial network structures (Jonas et al., 2018). Longitudinal case study research could provide additional insights into the changing effects of individual actors over time. Building on this, the question arises why actors' engagement might grow or decline over time and to what effect.

In addition, the analysis demonstrated that actors may not only show different engagement behaviours but also have a multitude of roles and that there might be roles that bridge several stages of the pre-seed phase. Thus, another important research question considers the different roles that actors might play in BM design. In a second step, these roles could be differentiated according to different stages of the pre-seed phase over time. Insights into actor roles and their varying importance would enable entrepreneurs to exercise agency when choosing how and when to engage actors by explicitly adjusting the structure and timing.

5 Project II: Actor Roles in Business Model Design

The fifth chapter of this paper presents the second of the three research projects, which conceptualises actor roles in BM design. The literature review on existing role concepts in innovation contexts indicated that, although many concepts have already been created, they are not transferable to other contexts than those of the respective study. Each role concept shows substantial differences in roles, even though research has been done in similar contexts, e.g., roles in open innovation, roles in radical innovation, and roles in innovation nets (Battistella & Nonino, 2012; Butzin & Terstriep, 2018; Dedehayir et al., 2018; Gemünden et al., 2007; Goodman et al., 2017; Hering & Phillips, 2005; Markham et al., 2010; Nyström et al., 2014; Story et al., 2011; Witte, 1973). While previous research has investigated the ways in which different actors are involved in innovation processes, little is known about the actor roles that may emerge during BM design. In this regard, certain behavioural patterns and types of networking activities may be characteristic for a group of actors, thereby leading to the emergence of distinct actor roles.

The objective of this study is to divulge the full cast of roles that come to prominence during the crucial pre-seed phase in BM design. To this end, BM research is combined with role theory in this study. This paper addresses the identified question of which roles actors play in the pre-seed phase of BMI in a new venture, how they can be characterised, and which actor groups perform these roles.

Building on the work of Mead (1934) and Biddle (1986), *role* is defined as a pattern of actions that becomes apparent during the process of BM design and that is affected by both the attributes of the actors and the context, which in this study is BM design. A comprehensive list of roles will enable actors to plot the frequency of their emergence and the activities they enact. Significantly, it is underlined that roles are distinct from actors and that the latter will assume a particular role at a given point in time. Additionally, considering the dynamic nature of BM design, this paper contends that actors can enact multiple roles. In sum, the cast of actor roles is highly valuable for different stakeholders to ensure that the roles are occupied by actors that can best perform the related crucial activities.

The following chapter gives an overview of the methodology used to pursue these research aims. Subsequently, the study on research project II and the resulting findings are presented. The chapter ends with a discussion.

5.1 Methodology

To approach the third exploratory research question, a qualitative research approach was deployed, like in the first study. Interviews were also employed as the principal data collection method in this study because, like in the first study, they are reasonable to use when retrospective and real-time data on the behaviour of actors are to be obtained (Gioia et al., 2013, p. 19).

This study is built on the same interview material as the first study, although the considered interview content and the analysis differ. While the special features of in-depth interviews were already outlined in the theoretical reasoning of chapter four, the selected method of analysis for the second study differs. Here, a qualitative content analysis was chosen. In the following, it will be shown what is meant by content analysis and how the procedure of content analysis is designed.

5.1.1 Qualitative Interviews

As already outlined in chapter 4.1.1, in-depth interviews help to uncover contextual factors surrounding a novel research application (Stokes & Bergin, 2006, pp. 34–35), help to create a flexible inquiry and establish a greater sense of trust and rapport between an interviewer and an interviewee, which can improve the comprehensiveness and quality of qualitative data (Stokes & Bergin, 2006, p. 28). Furthermore, the possible number of questions and the unrestricted duration of face-to-face interviews underpin the suitability of this method (Böhler, 2004, pp. 94–95). For further decision criteria on in-depth interviews, please see chapter 4.1.1.

For the following study, in-depth interviews comprise the main data collection method with the purpose to conceptualise actor roles in BM design.

5.1.2 Qualitative Content Analysis

Qualitative content analysis is generally understood to be an evaluation technique with the help of which fixed material that originates from a given communication can be analysed (Mayring, 2015, p. 11). The aim of content analysis is to describe the characteristics of the content of a text by researching who says what to whom and with what effect (Bloor & Wood, 2006; Vaismoradi et al., 2013, p. 400). It is used to analytically examine the trends and patterns of words used, their frequency, their relationships, and the structures and discourses of communication (Mayring, 2000). The special feature of this technique is that it can be used to analyse large amounts of textual information, although it differentiates from quantitative methods because it begins in a qualitative-interpretative way (Mayring & Fenzl, 2014, p. 543). By using content analysis, it is possible to quantify data using evaluation techniques such as quantitative content analysis (Gläser & Laudel, 2010, p. 198) and at the same time qualitatively analyse data by text-analytical methods that aim at interpreting the text (Mayring & Fenzl, 2014, p. 544). Qualitative content analysis thus represents a method for evaluating fixed communication (e.g., texts), proceeds systematically, is rule- and theory-guided by means of a set of categories, and is based on quality criteria. The qualitative element consists in the development of categories and the content-analytical systematisation of the assignment of categories to text components (Mayring & Brunner, 2009, p. 673).

As the definition of content analysis already indicates, this technique works with a system of categories to be able to evaluate texts in a structured way. This system of categories is either deductively determined through theoretical considerations or inductively determined from the analysed text (Mayring & Fenzl, 2014, p. 544). Depending on whether an inductive or deductive analytical path is taken, three modes of content analysis are differentiated by Mayring (1991, pp. 209–213), including the summary, explication, and structuring:

- *Summary*

Summary is a process of inductive category formation (Mayring, 1991, pp. 209–213). The aim of the summary is to reduce the content of a text relevant to the research question (e.g., an expert interview) in such a way that the essential content is retained and to create a manageable corpus through abstraction that is still an image of the basic material (Mayring, 2015, pp. 67–68).

- *Explication*

Explication describes a narrow and broad context analysis (Mayring, 1991, pp. 209–213). The aim of the explication as analysis is to draw on additional material for single parts of the analysed text, to expand the understanding and explain and interpret text passages (Mayring, 2015, pp. 67–68).

- *Structuring*

Structuring is a process of deductive category formation (Mayring, 1991, pp. 209–213). The aim of the structuring as analysis is to identify certain aspects in the material and to create a cross-section of the material according to predefined criteria, or to evaluate the material according to certain criteria (Mayring, 2015, pp. 67–68).

In the case of the qualitative content analysis applied in this study, the summary as content analysis with inductive categorisation was used. This procedure was chosen because the research question with which the text material is analysed and structured is aimed precisely at identifying categories in the form of role characteristics and actor behaviours. In the procedure of the summary, Mayring (2015) suggests reducing the material in several steps to carve out the essential contents. At the beginning of the qualitative content analysis, the units of analysis must be determined (Mayring, 2015, pp. 86–87). Furthermore, the topic of category formation must be determined based on theory. The selection criterion is then used to determine when a text passage becomes a coding unit. Thereby, categories are to be formulated in a generalised way (Mayring, 2015, p. 88). The categories also have to be reviewed together to ensure a uniform level of abstraction (Mayring, 2015, p. 88). After 10–50 % of the material has been analysed, the selection criterion and the level of abstraction have to be checked again (Mayring, 2015, pp. 86–87). If a revision of the criterion is necessary, the analysis process has to be started from the beginning (Mayring, 2015, p. 87). In the last step, the category system and its content are interpreted to be able to answer the research question. This procedure of the qualitative content analysis for inductive category formation is illustrated in figure 9.

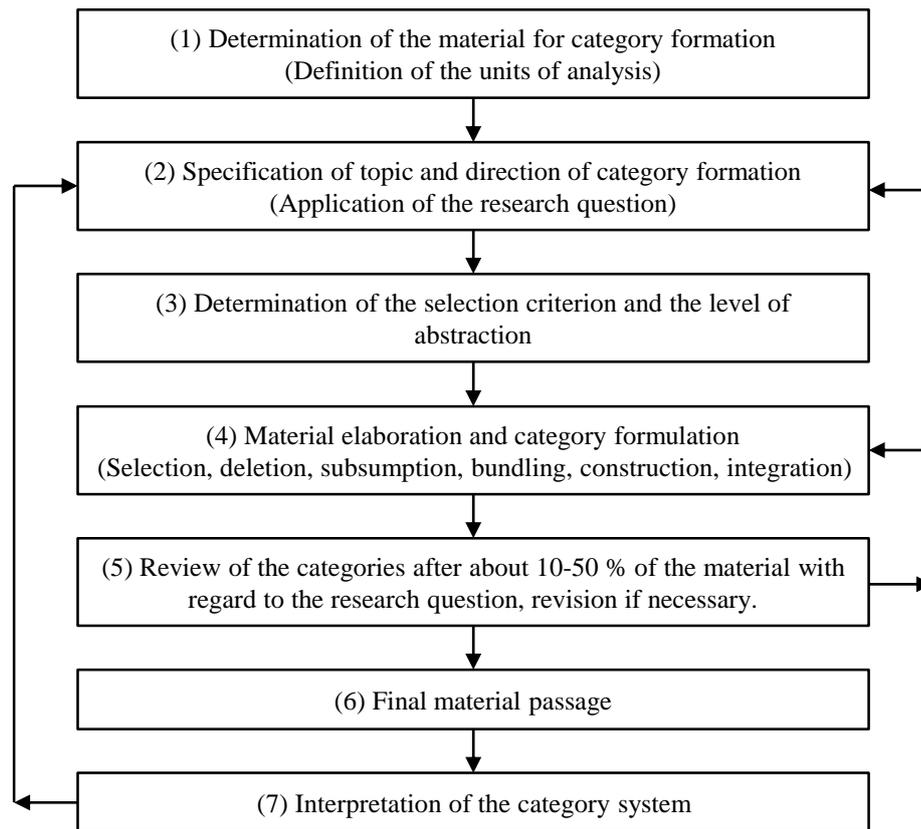


Figure 9: Procedure of qualitative content analysis for inductive category formation
(based on Mayring (2007, p. 75))

5.2 Qualitative-empirical Study

5.2.1 Preparation of the Interviews

The comprehensive survey, using qualitative semi-structured interviews with founders, that was conducted for the first study in chapter 4 also served as a basis for answering the third research question. The full process of the preparation of the interview guide, including the overarching areas and their explanations and the arrangement of the questions, is explained in relation to the first study in chapter 4.2.1.

In addition to the questions that were derived to answer the first research question, further guiding questions were included in the semi-structured interviews to specifically address actor roles. Therefore, before starting the data collection, it was ensured that not only actors and activities reflecting voluntary engagement behaviour were addressed in the researcher's questions but rather, care was taken to ensure that the questions—and hence the interviewees'

answers—would describe all emerging behaviours, activities, and performing actor groups. More precisely, the interviewing researcher ensured that also those behaviours and activities that were not voluntary but mandatory were explained in detail by the interviewees. Thus, the four overarching areas of the semi-structured interview guide that were already covered by the analysis of the engagement behaviours remained the same as for the first study. However, due to the aim of specifying actor roles, particular attention was paid to the interviewees' narration on the actors' activities, characteristics, attitudes, resources they integrated, and the outcome of their actions. This ensured that the interview data would allow a comprehensive analysis in terms of a role concept. The additional guiding remarks and thoughts were derived from the conceptual considerations (Gläser & Laudel, 2010, pp. 90–93) and from the theoretical background on role theory and previous role conceptualisations in innovation contexts. The full semi-structured interview guide is shown in table 13 (chapter 4.2.1).

5.2.2 Data Collection and Sample

The sample is identical to the sample from the first study (see chapter 4.2.2). The pre-defined selection criteria for the new ventures (i.e., the interviewees), the procedure of conducting the interviews, and the total interview sample are described and explained in detail in chapter 4.2.2.

The reason why the same sample could be used for both studies is that they have the same context, namely BM design in new ventures in the pre-seed phase. Both studies focus on the behaviours of actors and do not exclude any actor groups. In addition, the same selection criteria for the interviewees applied for both studies. The aim of the first and the second study was to retain a focal actor's perspective, reflect industry variety, only include innovative new ventures that were founded in the last 5 years, and ventures that are located in Germany. A more detailed explanation of the selection criteria is provided in chapter 4.2.2.

The difference between the two studies, therefore, lies in the analysis and the results that the respective analysis method and the coding procedure implicate. Engagement research is concerned with the behaviour of actors and the resources that actors integrate into interactions. These behaviours can be considered in general terms without having to differentiate individual behaviours into categories. Furthermore, engagement only implicates voluntary behaviours whereas, in contrast, role concepts are based on the identification of actor roles that correspond to certain tasks for which defined characteristics are required. In comparison to actor

engagement, role concepts are based on categorising activities and attributes into roles and subsequently assigning these roles to specific actors.

5.2.3 Data Analysis

This study's analysis followed the procedure of the qualitative content analysis suggested by Mayring (2015). Subsequently, each step of the procedure of the qualitative content analysis for inductive category formation will be explained related to this study. Mayring (2015, pp. 86–87) states that at the beginning of the qualitative content analysis, the units of analysis must be determined. First, the section of material that is to be processed with the qualitative content analysis (unit of analysis) must be determined. In this study, the material to be analysed resulted from the defined sample, consisting of the transcripts of the in-depth interviews. The coding units are based on clear meaning-bearing elements in the text and the context unit in each case was the whole interview with one founder plus additional transcript notes from the interviewee (Mayring, 2015, p. 88).

Furthermore, the topic of category formation was determined based on theory. With the research question derived from theory, the category system created can be systematically related to the research question at the end of the analysis. The research question aimed to determine which roles actors play in the pre-seed phase of BMI in a new venture, how they are characterised, and who performs these roles. Thus, the aim was to identify the behaviours, actions, characteristics, and attributes of different actors.

The selection criterion was then used to determine when a text passage became a coding unit. The selection criterion was fulfilled when a founder directly or indirectly spoke about actors (including the founders themselves), who had directly or indirectly influenced the design process of the new venture's BM through a certain action or behaviour. This included the search for concepts related to role, i.e., words associated with previously identified roles and concepts reflecting particular sets of activities (e.g., characteristic behaviours).

Before starting to work through the material, it was also necessary to consider uniformity regarding the level of abstraction of the categories to be formulated. Hence, categories are to be formulated in such a generalised way that case-specific statements of one actor can generally also apply to those of another actor (Mayring, 2015, p. 88). The categories were always formulated in such a way that they described an active action, i.e., they were described with a

verb (e.g., “developing a web-based prototype” or “helping to establish contacts to other actors”). The categories also had to be reviewed alongside each other with regard to a uniform level of abstraction (Mayring, 2015, p. 88). For example, after a category formulation of “guiding networking activities”, it made little sense to create a new category of “receiving an invitation to start-up event from foundation hub”, as the latter clearly undercut the level of abstraction from the first formulated category.

With the help of the selection criterion, the transcripts of the interviews were then analysed. Coding units were formed and, by using a consistent level of abstraction and sticking as closely as possible to the formulation in the text, a category was opened (category formulation). This formulation of the categories included only the main content of the text (selection), whereby the embellishments were shortened (deletion). Whenever a text passage fell into the selection criterion again, it was checked whether it could be included in an already formulated category (subsumption) or whether a new category had to be defined. If categories overlapped in their content, possibilities were sought to either merge them in case of congruence (bundling) or to reformulate them in such a way that both old and new passages could be represented under the category (construction/integration). In total, 32 categories were incorporated into the category tree, after subsumption, bundling, and integration of the categories.

After 50 % of the material was analysed, the selection criterion and the level of abstraction were checked again to see if a constructive category system for answering the research question resulted from the analysis (Mayring, 2015, pp. 86–87). For this purpose, this study was integrated into two independent university study projects, in which the formation of categories was discussed between the researcher, who was responsible for the study, and the students carrying out the study projects. This ultimately resulted in revisions and a great deal of valuable feedback, some of which led to a readjustment of the structure of the previous categories. In the first step, the number of categories was reduced from 32 to 22. The reason for this was that the categories were not directly aimed at the research question, or the categories only appeared in one interview and therefore no transferability was possible to the other cases. In a second step, the categories were reduced from 22 to 13. This can be explained by the fact that during joint discussions and exchanges, the researchers were able to bundle many categories, which were initially perceived as too different to bundle. Thus, when the researchers had difficulty in clearly identifying differences between the categories, they were merged. This double evaluation in the

form of an intercoder reliability test served as a reliability test of the analysis (Mayring, 2015, p. 127).

After the fine-tuning of the categories, the rest of the material was worked through with the final selection criterion and at the final level of abstraction. Further revisions were not necessary. Following the comparison of the category system, the categories were standardised regarding the title and combined into one system whereby the categories were given abstract names in the form of subjectives that best described the related activities (e.g., “the builder” or “the articulator”).

The final category tree comprised two main categories (network-oriented roles and task-oriented roles) and 13 subcategories (individual actor roles), which provides the structure of the results. In addition, a quantitative analysis of the frequency with which the categories are mentioned by the interviewees was carried out. This serves as an indicator of the importance of the respective categories (Greening et al., 1996, pp. 239–240). These frequencies are also presented in the results. Computer-aided data analysis utilising Atlas.ti was employed throughout the category formation procedure to enable detailed and structured analysis and the identification of theoretical categories (Bazeley & Jackson, 2007).

5.2.4 Results

Given that each actor’s activities and resources are heterogeneous and have a different value depending on the activities and resources of other actors involved with which they are combined (Ford et al., 2010), it is inevitable that all actors will interact differently in BM design. One approach to understanding these interactions is to consider different actor roles (Story et al., 2011, p. 954). Following this, what this chapter will seek to provide is a set of important roles in the context of BM design, and with these roles some actor groups who can fill the roles as well as some insights into the role dynamics. This chapter is less concerned with the hierarchies of the roles, and more with the characteristics of the roles and recruiting the right actors who can help drive each critical role or task. Thus, the newly-developed role concept will be used to portray how multiple actors are involved in the BM design process of a new venture, emphasising what activities actors engage in and how these activities portray a task or relational focus.

Whilst role theory is typically concerned with the roles of individual persons, it is contended that various entities, whether individuals, groups, institutions, or organisations, can assume roles. In the following analysis, a role is therefore defined as sets of activities (i.e., characteristic behaviours) that become apparent through the process of BM design and that are enacted by entities and affected by the context, which in this study is BM design. These emergent roles are assigned to task-oriented or network-oriented labels, to clarify the specific activities that define them. The next chapter will first report on the set of actor roles (i.e., the role concept) and then go on to specify which groups of actors (e.g., civil society, public institutions) take on the different roles. Afterwards, different role patterns, including multiplicity, ambidexterity, reciprocity, and temporality are discussed.

5.2.4.1 Specification of a Role Concept

To specify roles, the analysis began by examining the behaviours shown by the actors involved in BM design. More specifically, as different actions of various actors were perceived as influencing the design process and its outcomes, the analysis of the empirical data was concentrated on the influence of the actors' behaviours on the BMs and their development. Behaviours were analysed from one specific theoretically-derived standpoint: Did the behaviours take place on a task or network level, and thus, did they affect the BM or other actors? As a result, an empirically grounded typology of 13 actor roles was derived. All identified roles are based on a certain possession of resources (e.g., connections, capabilities, or skills) that are of crucial importance for designing a BM.

In line with Heikkinen et al. (2007) and Story et al. (2011), the 13 roles are differentiated into network-oriented and task-oriented roles:

- *Network-oriented roles*

The network-oriented role refers to activities with a relational focus affecting other actors, whereby the BM's performance is indirectly addressed. It describes a role behaviour in which actors are involved in planning, initiating, and coordinating relationships and network constellations to access resources. These roles are exemplified by the *cooperator*, *builder*, and *networker*.

- *Task-oriented roles*

The task-oriented role refers to activities directly affecting the performance and utilisation of a BM. It describes a role behaviour that is concentrated on achieving concrete goals and in which actors actively participate, e.g., by submitting content such as files, transferring knowledge, or offering specialised skills. In this analysis, task-oriented roles are exemplified by the *articulator, co-creator, evaluator, experience creator, expert, instigator, investigator, mentor, promoter, and hinderer*.

In the following, all task- and network-oriented roles are introduced. Table 18 summarises the roles and associated characteristic behaviours. The identified roles are partially comparable to roles in previous research on customers and/or actors in innovation contexts. The relevant literature references are also listed in table 18. Furthermore, an overview of examples from the interviews that are used to provide illustrative descriptions for each role, is provided in table 19.

Table 18: Overview of actor roles in new ventures' business model design process

Actor roles	Characteristic behaviours	Examples of literature interpreted
Network-oriented roles		
Builder	The actor mediates and establishes business relationships and business networks, e.g., between public institutions or private companies and the new venture or establishes contacts at trade fairs or start-up events.	Hacker et al. (2017) Heikkinen et al. (2007) Hering and Phillips (2005) Herrmann et al. (2006) Nyström et al. (2014) Story et al. (2011)
Cooperator	The actor actively cooperates with another party to achieve common goals and exploit synergies, e.g., sharing production facilities to reduce costs or promoting the joint development of new products.	
Networker	The actor forwards private and personal contacts and establishes trust between parties, he arranges contacts with people from the private sphere such as friends, family, or colleagues. The actor actively promotes the formation of networks.	Gemünden et al. (2007) Heikkinen et al. (2007) Hacker et al. (2017) Herrmann et al. (2006) Story et al. (2011)

Table 18: Overview of actor roles in new ventures' business model design process (continued)

Actor roles	Characteristic behaviours	Examples of literature interpreted
Task-oriented roles		
Articulator	The actor encourages the development of an initial loose business idea into a clearly articulated, comprehensive description of a BM.	
Co-creator	The actor is involved in the configuration and definition of the BM, supports the creation of different viable BM drafts, and develops prototypes of the product or service.	Agrawal and Rahman (2015) Butzin and Terstriep (2018) Hering and Phillips (2005) Nyström et al. (2014) Story et al. (2011)
Evaluator	The actor examines and evaluates different BM design drafts, e.g., by giving an assessment of which BM design works best to enter a market. This can include both positive and negative assessments.	Agrawal and Rahman (2015) Chervonnaya (2003) Hering and Phillips (2005)
Experience creator	The actor shares their opinion, perception, and experience and thereby influences the experiences, perceptions, and preferences of other actors, e.g., describing the personal impression of a situation or showing new ways to acquire business partners.	Heikkinen et al. (2007) Nyström et al. (2014)
Expert	The actor provides professional skills, necessary know-how, or expertise, e.g., regarding a given sector or industry. The actor is an expert in a field and shares their extensive knowledge and skills.	Butzin and Terstriep (2018) Chervonnaya (2003) Dedehayir et al. (2018) Gemünden et al. (2007) Hacker et al. (2017)
Hinderer	The actor shows no concessions or displays a general aversion to the BM. The actor is difficult to convince of the BM design, questions it, and expresses criticism.	
Instigator	The actor is actively involved in decision-making processes and/or actively makes decisions, e.g., influencing the choice of a certain price model and/or deciding which model to select.	Chervonnaya (2003) Heikkinen et al. (2007) Herrmann et al. (2006) Markham et al. (2010) Nyström et al. (2014)
Investigator	The actor conducts research and informs themselves in different ways about different subject matters and available options, e.g., collecting information about competitors or possible cooperation partners.	
Mentor	The actor invests time to serve other actors as a contact person and advisor on various issues. The actor can disclose new possibilities and options regarding the BM. Often mentors have many years of experience in entrepreneurship or in a specific branch or industry.	Gemünden et al. (2007) Nyström et al. (2014)
Promoter	The actor supports the establishment of the new venture with financial, infrastructural, and material resources, e.g., with investments, subsidies, equity, or office space.	Butzin and Terstriep (2018) Dedehayir et al. (2018) Markham et al. (2010) Nyström et al. (2014) Story et al. (2011)

Table 19: Illustrative evidence of actor roles in the business model design process

Actor roles	Exemplary quotes from the interviews
Task-oriented roles	
Articulator	<p>“I was at an event organised by the start-up office of my former university and got into a conversation with a former fellow student whose parents run a business. We talked about problems [of that business], and that the systems available on the market for that business so far either didn’t work or were too expensive. And then I got quite fascinated with the idea, that tracking the health of cows should be possible—and so the idea was born. I was basically thrust into the problem from practice.” (Founder 3)</p> <p>“All my friends said that it’s possible and I should make something out of the first [business] idea. I was actually the last one who wanted to admit it, but then at some point last year I said, ‘Well, I could start writing a business plan’.” (Founder 10)</p> <p>“It basically started as a freelancing project for a customer [of my former employer], for whom a specific problem was solved. And then, with the further development with the customer, a new product was created that we realised can also be scaled to other customers.” (Founder 14)</p>
Co-creator	<p>“We presented the project to the state office [and described our problems with the electromagnetic compatibility of the prototype]. They said, ‘just come and see our lab staff.’ They have a lab down there and usually do test things like that, and can clarify beforehand whether our product idea is ok so far [...]. Then we went there a week later with a [first] prototype and had it tested.” (Founder 5)</p> <p>“I was then given the condition to actually try to construct [a prototype] once. To build it by hand. Then I tried to build a small prototype of it. Of course, with terrible quality and accuracy. [...] But it has shown that it is basically possible and works.” (Founder 12)</p> <p>“Together with a robot manufacturer, we assembled a prototype free of charge for both sides and received feedback from them. A lot of technical feedback, but also [...] feedback for our BM development, because of course they also know what works for customers and what doesn’t.” (Founder 14)</p>
Evaluator	<p>“The company [T] was involved, a management consultancy or creative agency. We presented the idea [...] to them. They assessed it in terms of the viability of the BM because they also had an architect with them.” (Founder 1A)</p> <p>“We [developed] the pricing model in a group during a training session in the module ‘Creating a Business Plan’ or ‘Business Models’. We sat together with about seven or eight start-ups and went through the BM design of every single start-up. What makes sense? Does it make sense to sell it? Does it make sense to lease it? Are there maybe other options?” (Founder 5)</p> <p>“At some point, it occurred to me to establish a pharmacy cooperation out of the [former business]. We discussed it in the company and verified the idea among family and friends. [...] I had to pass the idea to a committee, where it is referenced, whether it is just a random idea or whether there is really something to it. I need a reference point because I am quite enthusiastic about new ideas.” (Founder 8)</p>

Table 19: Illustrative evidence of actor roles in the business model design process (continued)

Actor roles	Exemplary quotes from the interviews
Task-oriented roles	
Experience creator	<p>“For a while, we had the idea of pursuing a two-sided market and collecting money from both sides. Then we were told by a sales consultant that this would not be a good idea because it was very unusual on that market to get paid from both sides.” (Founder 7)</p> <p>“There was a six-page article about my company in a trade magazine a few months ago. As a result, someone from a marketing agency got in touch with me. In principle, he no longer needs to earn money, but is now close to retirement age and does the projects he feels like doing on the side. He told me that he really likes my BM idea and wants to support it. I can now ask him anything. [...] And he also questions my BM, e.g., ‘What are the developments?’, ‘Is there anything new?’, ‘I have another idea [to tell you about]’.” (Founder 10)</p> <p>“I know a lot of founders who have formed their BM only based on fundraising talks with investors. [...] If someone is looking for money, then the individual conversations with business angels and investors very often shape the BM in the early phase, because you simply know what is important based on the questions.” (Founder 11)</p>
Expert	<p>“Of course, I also tried to look for experts from agriculture, so to say from my industry, at an early stage. I went to an experimental station near here. [...] I also sat down with an institute director and a professor [from the University of] Giessen and told them what I had found out. [...] Since I had no idea about the industry, I just had to inform myself and actively ask for information, because otherwise I may have a nice result, but no one is interested in it.” (Founder 3)</p> <p>“There are individual members of various police special units with whom I maintain a friendly relationship to ensure a professional exchange. The feedback is very valuable.” (Founder 10)</p> <p>“I’m in contact with people with market expertise, who I can call to ask about anything, whether it’s about the beauty market, retail market or something else.” (Founder 11)</p>
Hinderer	<p>“[My visit to the] start-up office was very disappointing, to be completely honest, in terms of concrete support. There was a lot of ‘talk’, also regarding the scholarship I hoped for. There are very innovative products that are always perceived as innovative on the market. And then you get told from [sic] the start-up office that your idea is not innovative enough.” (Founder 10)</p> <p>“After applying [for funding], we had to go to Berlin and present our BM. There was a jury of 15 experts and the first questions they asked were clearly aimed at the fact that some did not understand how our BM works. So even these experts, who were not all from our field, but they were all professors from the field of mechanical engineering or physics, did not yet understand it, even based on a hundred-page application sheet.” (Founder 12)</p> <p>“My experience [during the discussions with other actors] was absolutely not negative. Though, negative in the sense that it took a lot of time. Meaning that I participated, e.g., in a lot of seminars. They are nice and quite good, but especially when you are in the start-up sector, you realise how much time it takes [to participate there]. Those are these kinds of days when you say that you could have discussed it all in a concentrated way in a one-on-one in only an hour.” (Founder 13)</p>

Table 19: Illustrative evidence of actor roles in the business model design process (continued)

Actor roles	Exemplary quotes from the interviews
Network-oriented roles	
Instigator	<p>“I wouldn’t say that I decide everything on my own, even though I am the one who makes the decision in the end. The fact is, that I don’t know everything and I can’t do everything. That means I rely on everyone who supports me in some way, be it my co-founders or the shareholders.” (Founder 3)</p> <p>“My partner is primarily involved in [decision-making processes]. Especially, because he was around during the whole development process and the office is in our shared living space. I consulted him on every major step and interviewed him on all news. He approaches [tasks] differently that [sic] I do, he is much more rational [in his thinking] and is an outside [of the company] observer.” (Founder 9)</p> <p>“The close environment is indeed very decisive; this also includes the experiences of the people who are involved in the decision-making process. ‘Do these people know other people who have already founded?’, ‘Did it go well?’, ‘Do they come from an entrepreneurial family or not?’, ‘Do they have people in their family or in the immediate vicinity who have [already started a business]?’” (Founder 12)</p>
Investigator	<p>“It’s relatively easy to get information on how to [found a business]. There are a lot of books, but also books you shouldn’t read.” (Founder 1A)</p> <p>“Of course, [my associate] was very critical concerning the BM draft itself, because he had less of a market overview on his own, as he had not dealt with the industry at all beforehand. Thus, he did a lot of research.” (Founder 12)</p> <p>“We also look at competitors, e.g., what pricing models does the competition have?” (Founder 14)</p>
Mentor	<p>“I would name Ms [Z] from the business innovation centre as the most important contact. She does a lot for the whole region. She has many contacts, tells you what to do, and finds a solution for everything. She provides 70 % of the contacts, information, know-how, and so on, and then another 30 % mental support. She always finds some time to have an exchange.” (Founder 4B)</p> <p>“There were some discrepancies at the beginning. But then I went to [Mr A], who was one of my mentors. He has a big engineering firm, which also deals with energy efficiency. I’ve been working with him for years and I asked him, ‘Could you help me? How much does this cost? What does everything cost us? What do you charge for office space?’ And so on.” (Founder 5)</p> <p>“Probably everything would have been different if we hadn’t met someone like [Ms H] and her family. They help us with all kinds of things, like legal things are always difficult, but also all the other things, like ‘What else should I do?’, ‘Are there any ideas how I could develop this further?’, or ‘Do you maybe know someone I could ask?’” (Founder 16)</p>
Promoter	<p>“My doctoral supervisor, who is also my boss at company [D], tolerated me doing something else during my working time. It wouldn’t have worked without him. If I’d had another employer, I wouldn’t have had the time [to start my own company].” (Founder 3)</p> <p>“Our business is very family-oriented, the overall constellation of my company. Most of the time, family and friends are the first investors of a business idea and it was no different in my case. The first investments were made by me and my family.” (Founder 8)</p> <p>“[Thanks to the scholarship], we were able to access the university network. For example, offices that we could use.” (Founder 15)</p>

Table 19: Illustrative evidence of actor roles in the business model design process (continued)

Actor roles	Exemplary quotes from the interviews
Network-oriented roles	
Builder	<p>“Ms [B] from the business innovation centre has played an important role. She has an incredibly large network and took us to various trade fairs; she introduced us to many people.” (Founder 4A)</p> <p>“My network developed partly at short notice, through other clients who said, ‘There’s someone who’s interested’. The contact then developed further from that point.” (Founder 10)</p> <p>“I see the advantages [of this start-up hub], especially in the support you get and the many business contacts to establish, including with politicians. Socializing is sometimes the most important thing. [In the hub] are often events of various kinds, including Hackathons. At these events, we have made many contacts with companies, and they have been able to give us new input and make further contacts. Companies [...] rally to join such events and it’s easy to get into a conversation.” (Founder 16)</p>
Cooperator	<p>“The agricultural farm [M] let us test our prototype for a year and a half now because they have cows and might profit from the gadget if it works as well. That has been a problem [before], that we couldn’t test anything without cows.” (Founder 3)</p> <p>“We have already planned a development partnership. That has not yet been fully formulated, but it is a partnership in which we want to develop a product together benefitting both sides.” (Founder 12)</p> <p>“We attended a trade fair together with company [A], a robot manufacturer. We built a prototype together free of charge for both sides, [as a chance] to get feedback of [sic] potential customers at the fair.” (Founder 14)</p>
Networker	<p>“A friend [C], who finished his students’ exams back in [sic] school together with me, advised us on patent protection, data protection, legal protection etc. He created the terms and conditions of use that we are now putting on the website. That’s where he brought in his expertise.” (Founder 1A)</p> <p>“Professor [B], e.g., supported us. He passed on contacts and gave us tips on where to go. But these contacts were made through him personally, for me he is more a representative of the whole region and less a representative of the university.” (Founder 4B)</p> <p>“I got my partners through my private network. I just have a good network. Not private, personal I would rather say. Private sounds like dad, mum, brother, sister.” (Founder 6)</p>

Network-oriented roles

The *builder* primarily engages in establishing business and social relationships with other parties, e.g., between public institutions or private companies and the new venture. Specific places for builders to establish relationships are trade fairs, special start-up events, workshops, and co-working spaces. The main objective of the builder is to initiate network connections by deciding which potential actors should be contacted to become involved in a BM design process. They attempt to enable and facilitate meaningful connections and collaborations between a new venture and other groups of actors by matching them and their organisational activities. Thus, depending on the requirements, they build contacts with investors, potential customers, and cooperation partners, who also pass on their network contacts. As a result, founders can profit from constantly growing network constellations. For example, actors who

have large, interconnected networks include universities, research institutions, and start-up offices, that they jointly provide to founders. Moreover, founders themselves actively take the role of the builder by attending events or directly contacting specific people. This role's attributes have much in common with the role of a network coordinator that, according to Boos and Heitger (1996) and Winkler (2002), include specific tasks such as communicating the necessity and advantages of inter-organisational cooperation to involved actors, motivating the involved actors in the network, coordinating network activities, and maintaining communication structures. Hence, builders are required to have good communication skills.

The *cooperator* initiates or approves joint activities as part of the design process. Cooperators are actors who come together with the new venture's key actors and decision-makers (e.g., the entrepreneurs) to review the scope of potential joint business activities or joint knowledge expansion. They are willing to arrange cooperation with other actors or institutions to achieve common goals and exploit synergies. This may include the sharing of production facilities to reduce costs or the promotion of joint development of new products. For example, two start-ups that had simultaneously been working on a similar topic discussed their ideas at a networking event. As a result, they decided to collaborate and were able to access new resources which allowed the joint development of their discovery competence. Hence, cooperation emerges when commonalities are discovered and actors realise that their BM concepts might generate greater benefit when they are combined. However, cooperators also cooperate with a new venture, even though this might not be advantageous and profitable to them. In sum, to successfully enter such cooperation, cooperators must apply a range of physical, cognitive, communication, and teamwork skills.

The *networker* creates business and social relationships using their private and personal contacts. Networkers act as marketers of a new venture's business idea in spreading it to other actors and distributing positive information about a new venture to actors outside the venture's existing ecosystem. Like the builder, networkers are required to have good communication skills. They actively promote the formation of networks by aiding in building credibility and trust. It is hardly surprising that trust plays a fundamental role in networking and that it requires a cohesive group of people with strong social ties inside and outside of the circle of familiar faces to build trust. Coleman (1990) already discussed how social relationships, where two individuals not only know each other but share a large number of friends, can help to create trust which is the basis for exchange to take place. The role of the networker is particularly

important for a new venture since typical individuals only maintain close ties with actors belonging to a small group of friends and family. Entrepreneurs are mostly not connected to other social and business groups while they are in the pre-seed phase. Hence, the networker serves as a bridge to other actors and institutions. Granovetter (1973) highlights the importance of bridging ties, as these ties expose actors (i.e., entrepreneurs) to new information and opportunities. The transfer of tacit knowledge typically requires strong social ties between the holder and the recipient of that knowledge (Stuart & Sorenson, 2005, p. 242) and hence entrepreneurs can access tacit valuable knowledge through the help of networkers. This is supported by this study's data which clearly shows that 11 of the interviewed nascent entrepreneurs relied on the networkers to access tacit valuable knowledge. Significantly, founders themselves often also act as networkers as they draw on their personal contacts that they gained through former jobs, friends, or family. Altogether, in comparison to the builder, the networker's acting has more to do with influencing the content of existing relationships than creating wholly new ones. Networkers manage and use existing relationships to benefit others. This circumstance empowers the networker to decide who is and is not included in any actions. Accordingly, the power of the networker is comparable to that of the gatekeeper (Heikkinen et al., 2007; Markham et al., 2010).

Task-oriented roles

The *articulator* facilitates the assessment and development of a posted business idea. This role represents actors who notice significant opportunities or ideas and start promoting and encouraging their development process. These actors try to place as much emphasis on an idea as possible, which comprises initiating, inspiring, and/or generating the idea for a BM. Thus, articulators can be referred to as the initiators of a business idea. This role is not only be played by the founders themselves, but also by other actors who strengthen the idea. It is also the first role to become apparent during any BM design process in this role concept. It operates at the task level where its actions are a basis of what the BM has to offer. Consequently, articulators can become the reason to design a comprehensive description of a BM from an initially loose business idea. Articulators connect the existing vision, thoughts, and resources by attempting to maintain an overall picture of the idea development process and its potential outcome. Articulators act out of different situations and circumstances as a response to a problem. They mostly find themselves or their close environment (e.g., family members, friends, customers,

colleagues) in a situation that requires change, and thus they actively search for solutions or advance established solutions by others.

The *co-creator* is active in the actual configuration and definition of a BM by providing ideas, informing, putting claims on the BM draft, and validating the processes necessary to make the product or service. Co-creators help by bringing ideas into viable BM drafts and thus they contribute to the design of the BM by adding to and modifying the BM idea. In this regard, co-creators promote and demand an ongoing process of improvements and modifications to the BM. Moreover, co-creators are involved in the production of early samples, models, prototypes, and testing of pilots and trials. This ensures that the required specified attributes function as intended. Co-creators also offer access to real engines to test an already existing architecture of a product and ensure that the potential for unexpected errors and bugs is assessed. Consequently, they contribute to the BM design by concretely working for its realisation. Actors taking the role of the co-creator contribute a significant amount of time, technical expertise, and knowledge resources to turn a concept into a real BM and real product or service.

As the name indicates, the *evaluator* can judge (i.e., evaluates) a design of a BM. More specifically, evaluators can judge exactly which BM design works best and their contribution is vital for getting a competitive advantage or successfully entering a market, thereby circumventing disappointments and rejections. This includes giving approval, but also giving rejecting feedback and asking design-specific questions. Some evaluators are trained to observe situations (i.e., are attentive to detail), know the subject matter of BM problems well, think analytically, and articulate their views clearly and convincingly. These cognitive skills are important to make cost-benefit analyses of the different BM design options and to plan the future value proposition accordingly. Settings that are specifically geared towards evaluating a BM and assessing its viability are workshops, competitions, or special assistance offers for founders provided by public institutions and private companies. Entrepreneurs can actively make use of these offers. At this juncture, the role of the evaluator is determined by the position of an actor, e.g., an expert actor becoming a judge in a BM competition. However, other actors are not assigned to take the role of the evaluator by their position but rather the founders make them evaluators. This became evident in the case of the founders' friends and family. In this case, founders on their own initiative ask their friends for their opinion about the BM. Thus, evaluators do not necessarily have to have detailed knowledge, expertise, or special analytical skills; they might also simply give their approval with a *yes* or *no*. From this, it can be concluded

that founders make actors take the role of the evaluator if their BM is not yet mature enough to have it assessed professionally and they want it to be verified and discussed in a familiar environment in a first step.

The *experience creator* participates in the design process by providing rather incremental input and influence (e.g., new ideas on a BM or a wider context or perceptions on network formations) but does not cause any big changes to a BM. Actors who take the role of the experience creator give impulses to make changes to a BM and shape the BM, primarily through verbal exchanges whereby they sharpen both the product and the BM during discussions. However, the experience creator does not work on and give clear suggestions for solutions but rather highlights problems. This role is mainly driven by generating and submitting ideas and aiming to make experiences explicit, transferable, and shareable with other actors. Communication skills are vital to make these more intangible resources (e.g., knowledge) available to others. Entrepreneurs can benefit by gaining access to the experience creators' latent opinion, perception, and past experiences, and capitalising on them. Especially actors who have a lot of experience in the start-up sphere, such as venture capitalists and investors, are of importance as they influence whether a BM receives funding or not. Moreover, actors can shape or take the role of the experience creator. They may show their own interest in a new business idea and take the role by giving spontaneous feedback. On the other hand, they may also be targeted by founders who try to sharpen their perception of a BM and make actors take the role of experience creators.

The *expert* supports a new venture by disclosing their broad expertise and specific knowledge likely to provide the premise of solutions to satisfy a new venture's needs. Experts have BM-specific skills and specific skills according to individual BM elements (e.g., the pricing system or customer needs). The expert role demands technological, organisational, or market expertise to make a new venture's value proposition more attractive and accepted in the market. The literature typically associates the expert with actors such as universities and research institutions, which generate inventions, discoveries, and knowledge (Clarysse et al., 2014). This fact is supported by the study's results. Such knowledge creation and dissemination activities are likely to take place in the very early stages of the BM design process, providing the knowledge base upon which a viable BM design can be constructed. Thus, specialist knowledge and consultancy are necessary (Humble & Jones, 1989) for new ventures in the pre-seed phase, although this may not reside within their organisational boundaries (Story et al., 2011, p. 954).

Alongside, policy and regulation experts can help in reformulating or changing infrastructure policies and the regulatory context (e.g., permits) to enable the BM's entrance into the market.

The *hinderer* is a role that at least some of the entrepreneurs considered as interfering with and negatively influencing the ongoing design process. Hinderers do not support other parties (i.e., the entrepreneurs) with constructive or helpful suggestions. Rather, they show a general aversion to a certain business idea or BM design. Thus, hinderers are difficult to convince of a BM design. They question its viability and openly express their criticism. Some hinderers may not necessarily negate a BM, although they also do not support it (e.g., because they do not grasp a value proposition). In other words, they may be neutral towards a BM. Hinderers can also be actors who offer knowledge and expertise but actually do not have the necessary specialist knowledge as required (e.g., knowledge about the circumstances of an industry). This is depicted by actors who want to take on the role of a supporter, but instead, they cause more confusion than giving any support. Founders perceive these actors as time-consuming and disruptive. One reason why such unwanted interactions may occur is that while the start-up market is flooded with experts and advisors, these may only have superficial knowledge. As a result, founders are lost concerning where to find suitable contacts who provide more target-oriented feedback.

The *instigator* causes changes to a BM design by making decisions or through influencing another actor's decision making. Instigators may directly be in the position to decide or influence the decisions behind the actual design operations of a BM. The second point implies that an actor acts as an advisor or decision-initiator to the actual decision-making person. Usually, decisions are made by the founders themselves. They are supported in decision-making by external actors such as the mentor, partners, or the family. In the choice of which actors should be actively involved in decision-making, experiences play a decisive role: on the one hand, the experiences that a founder has had with the respective actor to support the decision-making (e.g., a family member), and on the other hand, the experiences these actors have made in their past (e.g., to be able to draw on similar past experiences). Furthermore, although other actors do not hold the position to decide themselves, specifically in relation to investors or customers, they may exert pressure on the founder(s) to change their decisions. The role of the instigator may then try to influence a decision on whether to implement a certain pricing model, cooperate with a potential partner, or produce a service or product on their own. Notably, this role requires good cognitive skills, the ability to make a correct assessment of a situation and

the needs pertaining to it (Chervonnaya, 2003, p. 357), and to make a professional judgment. Therefore, instigators build on their technological, organisational, and market know-how and their personal experiences.

The *investigator* conducts research and collects information and data about different subject matters, e.g., collecting information about competitors, possible cooperation partners, or market regulations. Investigators see it as their task to gather information through observations, questioning and surveys, and independent research. They observe competitors and other start-ups facing similar issues. Questioning takes place both formally in the form of interviews and surveys, and informally in the form of unplanned discussions. Independent research is done in a variety of ways. Probably the most obvious way to do research is to search for information and data on the internet and in books. Further selective information is obtained through participation in professional workshops and training. Additionally, investigators set up joint research projects with other parties, e.g., with universities. Through these projects, they gather the necessary start-up specific data that could not be acquired through secondary research. Thus, the role of the investigator requires actors to possess the skills related to precise and full representation of information relevant for the BM in question. Accordingly, these actors mostly bring in good communication and organisation skills. They can clearly report and select the required information, at best without excessive details, and support the information with documents (if applicable). Hence, they manage to make intensive use of the sources found for setting up and adapting a BM.

The *mentor* is the closest reference person for an entrepreneur concerning diverse questions and uncertainties. Mentors educate and prepare entrepreneurs on organisational, social, environmental, and technological issues for the sustainable growth of their venture. In this respect, they take on the role of a teacher. Mentors continuously try to understand a BM, contribute comments, provide large amounts of feedback, and give reasons and descriptions of what they like about a certain BM design or why a design might not be appealing to them. They can look beyond the status quo and disclose new possibilities and options. Often, mentors denote many years of experience in the field of entrepreneurship or in a specific branch or industry and hence they can provide constructive feedback and specific suggestions for further idea development, thereby allowing an entrepreneur to benefit from a joint idea and development process. Actors who take the role of the mentor possess many key resources at the same time (e.g., experience, knowledge, and network connections), which leads to the fact that

this role overlaps with many other roles. The data highlights that mentors are strong at entrepreneuring and have the interpersonal and plan-oriented qualities needed for BM development. The mentor also appears to engage even more in supporting and motivating founders than other actors do. Most often, actors do not actively take the role of the mentor, but rather certain circumstances (e.g., regulatory requirements, positions such as a professorship at a university, or timing) can make them a mentor person.

The *promoter* functions as a provider of infrastructure, venues, financial resources, material resources, and other types of corresponding resources. Promoters refer to a role involving the offer of initial funding to resolve a social or environmental issue that sets the BM in motion whereby promoters provide possibilities for development actions to take place. If a start-up is not being self-financed, financial resources are most commonly provided through scholarships or investors. Furthermore, an example of infrastructural resources is office spaces that are provided free of charge, e.g., by a university or a former or present employer. Time as a resource is made available when founders are enabled to use their current working time by a current employer to build up a start-up during their regular working hours. In such instances, the founder does not have to justify their work, nor do they receive a lower salary from their current employer.

5.2.4.2 Role Dynamics and Patterns

Building on the role concept, a variety of role dynamics were identified. Role dynamics describe the *frequency* with which the roles became visible and the type of influence the roles have on a new venture. It also describes which roles are taken by which actor groups. According to this, there are different patterns reflecting these role dynamics, including role multiplicity, ambidexterity, reciprocity, and temporality.

Frequency of roles

Table 20 illustrates the frequency of all roles by comparing the roles to the interviews and highlighting which roles were mentioned by which interviewees.

Table 20: Prevalence of actor roles among the cases

	Interviewed founder(s)																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Articulator	x				x		x	x	x	x	x	x	x	x			x	x	
Builder	x	x	x		x			x		x	x	x		x	x	x		x	x
Co-Creator	x		x		x			x	x	x	x	x	x	x		x	x	x	
Cooperator	x		x	x	x			x		x		x	x			x		x	x
Evaluator	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Experience creator	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Expert	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	
Hinderer	x			x						x		x	x						
Instigator	x		x	x	x	x	x	x	x	x		x	x	x	x	x	x		x
Investigator	x		x	x					x			x		x			x		x
Mentor	x			x	x					x				x	x	x	x	x	x
Networker	x	x	x	x	x	x	x	x		x	x					x		x	
Promoter	x		x	x			x	x	x	x		x	x	x	x	x		x	x

This frequency is a first indication of the importance of single roles. Roles that were mentioned in every interview are given higher importance, as they appear regardless of the industry, funding, experience, etc. of the entrepreneurs. Roles that were only mentioned in some of the interviews are rated with medium importance, as their appearance may depend on the context. Roles with low importance, i.e., those that were only mentioned by one or a few interviewees, were not included in the role concept during the data analysis, as their occurrence may be determined by chance. Following this importance rating, the roles were divided into basic actor roles and add-on actor roles. Basic actor roles are those that were prevalent in at least 70 % of the cases, while add-on actor roles are those that were prevalent in less than 70 % of the cases.

- *Basic actor roles*

The case data shows that the most frequently occurring and hence the basic roles are those of the evaluator, experience creator, expert, instigator, and promoter. All these roles, excluding the promoter, especially provide expertise and the competence to analyse and solve complex problems. The promoter, on the other hand, brings in the necessary infrastructure (e.g., funding, working space), which lays the foundation for any BM development.

- *Add-on actor roles*

The add-on roles are the articulator, builder, co-creator, cooperator, hinderer, investigator, mentor, and networker. Only two of these roles, namely the investigator and the hinderer, are mentioned in less than 50 % of the cases. The investigator might be mentioned less

frequently because the role is taken by the founders themselves in most cases and this role was usually taken for granted during the interviews, because making enquiries and collecting information is indispensable before starting to develop a BM. The hinderer, on the other hand, was mainly prevalent when support or funding got rejected, which was not often the case. However, the frequency of the appearance of the hinderer strongly depends on the sample choice.

Furthermore, table 20 highlights *role couplets* that describe which roles were prevalent together in the same cases. These roles may have certain commonalities, e.g., the same resources or skills are provided. Overall, table 20 highlights multiple overlaps because the role concept only illustrates roles that became evident in the majority of the cases and thus actual role relations can only be assumed based on the data and cannot be clearly determined. However, one such apparent combination of roles is the pairing of the investigator and the instigator, which are referenced in the same cases. Both roles require the ability to do research and the ability to get a general idea of a situation. Having this general idea in mind, the investigator can make clear suggestions regarding the BM components and the instigator can implement these suggestions by making final decisions. Thus, the same competences are needed at different points in time. The case data shows that both roles can be combined in one activity. The entrepreneur of case 5 (Founder 5) highlighted how a start-up office had taken on both roles at the same time by offering a specific BM workshop:

We visited 12 training courses enabled by the start-up office, that are trainings with special advisors. They were all about developing BMs. [...] There was a special module on developing a business plan. We sat down with about seven or eight start-ups and went through every single start-up [and its problems] and tried to find solutions all together. (Founder 5)

Type of influence

Furthermore, not all roles of the role concept directly influence a BM, as there are also remote roles that indirectly cause changes to a BM. These roles do not directly influence a BM design or the final offering it produces but deal more with the operative or relational level activities or the supplementary services (e.g., regulatory questions, establishing contacts to cooperation partners) of the finalised value proposition. For example, the networker and the builder both establish new contacts and expand entrepreneurs' networks. The case data shows that this by

itself does not lead to changes of a BM but may help to establish a potential cooperation between a new venture and, e.g., a private firm. Furthermore, it may also help to find a potential investor and define a financial model. One founder explained this circumstance as follows:

“Professor [D] exposed a lot of contacts to us. Even the potential investor from Friday, he also arranged that contact.” (Founder 1B)

Another example of a role that indirectly influences the BM design process is the hinderer. In not approving or supporting a BM, hinderers should be aware that they provoke the effect that founders may not receive a certain courtesy they had hoped for (e.g., funding). This role, thus, may have an indirect negative impact on the future improvement and possibilities of a BM.

Divergent actor groups

The case data also indicates how divergent actor groups (e.g., civil society, private companies) contribute to a new BM. In general, there has been a tendency to treat the actor and role as largely synonymous, e.g., a designer performing a designing role and a producer performing a producing role (Story et al., 2011, p. 955). However, it is not inherent which roles must be performed by which actors and previous research implicated diverse actors in connection with new ventures. For example, formal network actors such as federal agencies, agencies of economic and business development, associations, banks, and lawyers (Birley, 1985) can act as providers of resources such as funding, legal frameworks, support in networking activities, commissioning, and building capacity, technology, and production sheds (Butzin & Terstriep, 2018, p. 78). They can contribute to the success of commercialisation and act as knowledge brokers who disseminate information and establish expertise and credibility (e.g., Aarikka-Stenroos & Jaakkola, 2012). Other actors often mentioned in the context of new ventures are private companies that include actors such as customers, suppliers, investors, venture capitalists, competitors, and employees (e.g., Andries et al., 2013; Chesbrough & Rosenbloom, 2002; Reymen et al., 2015). They provide resources such as specialised competences, infrastructure, and financials (Butzin & Terstriep, 2018, p. 78). Competitors and established firms can also be a potential source of strategic collaboration or partnering that can fortify and upgrade commercialisation of and demand for a new product or service (e.g., Molina-Castillo et al., 2011; Story et al., 2009; Tolstoy & Agndal, 2010). Moreover, previous research highlights science parks, incubators, and research institutions and universities (e.g., Aaboen, 2009; Lubik & Garnsey, 2016), who can establish knowledge and trust due to their expert status

and facilitate business ties with other actors (e.g., Breznitz et al., 2018; Ingnas et al., 2007). Finally, new ventures also make use of the family and friends of the founder(s) for getting support and resources (Greve & Salaff, 2003, p. 6).

Based on these findings, actors were divided into certain actor groups to contrast the different actor groups with the study's cases and the developed role concept. The determined groups include formal agencies (e.g., federal agencies, agencies of economic and business development, and associations), financial institutions, private companies and persons, research and education institutions, and civil society (e.g., family and friends). Furthermore, incubators (e.g., start-up hubs) and the entrepreneurial team themselves were included as separate groups. After defining the actor groups, the interview data allowed for detailing these groups according to the 19 cases by comparing the actor groups to the interviews and highlighting which actor groups were mentioned by which interviewees. Table 21 displays the prevalence of the actor groups among the cases.

Table 21: Prevalence of actor groups among the cases

	Interviewed founder(s)																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Civil society	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x			
Entrepreneur(s)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Incubators			x	x	x	x	x		x	x	x	x	x	x	x			x	x
Financial institutions										x									x
Private company/person	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x
Formal agencies	x		x	x	x			x	x	x		x	x	x	x			x	x
Research/education institutions	x		x	x	x	x				x		x	x		x	x	x	x	x

As shown in table 21, financial institutions tend to play a subordinate role in the early pre-seed phase as they were only clearly involved in two of the cases (Founder 10 and 19). The lack of involvement by financial institutions can partly be explained by the fact that many of the entrepreneurs were financially supported by research and education institutions or formal agency programmes. Others were also supported by family members or equity financed. All other actor groups can be linked to a high average share of 74 % in the cases, i.e., a prevalence of the actor groups in 14 of the 19 cases. Of these, research and education institutions have the

lowest share with 68 % (i.e., a prevalence in 13 of the 19 cases). This can be explained by the fact that some of the founders had already gained business experience in their past, e.g., through previous founding attempts in their own ventures or by supporting other start-ups in founding. In addition, some of the founders gained enough business experience through previous employment engagements that enabled them to largely act independently without the support of external actors. The close relationship of most of the new ventures to research and education institutions in this study's sample can be explained by the fact that the latter provide material and immaterial support as well as relational support free of charge. Furthermore, it is not surprising that in all cases the interviewees named themselves as founders who had contributed resources to the BM.

By examining *role sets* and consequent behaviour, it was found that there are different specialisation patterns reflecting role dynamics. These patterns are based on the four patterns identified by Nyström et al. (2014) in the context of open innovation. The patterns are role multiplicity, ambidexterity, reciprocity, and temporality. Analysing them is necessary to better understand role sets in the BM design process.

Role Multiplicity

None of the actor groups acted only in a single role during the early phase of the BM design process. All actor groups held and played multiple roles and, in each situation, the role of an actor was determined by their ambitions, connections, and resources, and by the way that other actors in the process perceived these actions. A striking example of role multiplicity is seen in the following excerpt in which one consultant played multiple roles including the builder, mentor, and experience creator.

I would name Ms [Z] from the business innovation centre as the most important contact. She does a lot for the whole region. She has many contacts, tells you what to do and finds a solution for everything. She provides 70 % of the contacts, information, know-how, and so on, and then another 30 % mental support. She always finds some time to have an exchange.
(Founder 4B)

Further analysis was done to describe role multiplicity by contrasting which actor groups held and played which actor roles. Table 22 displays the prevalence of the actor groups among the 13 actor roles in percentages. For this purpose, the overlapping of the actor groups in relation to the roles were counted with the help of Atlas.ti. The percentages only serve to highlight a

tendency and are thus not to be regarded as fixed. Nevertheless, this form of presentation was chosen because it provides more precise information about which roles were taken by which actor group and how intensively than would a pure representation of the two options “prevalence occurred” or “did not occur”.

Table 22: Percentage of actor groups among the actor roles

	Civil society	Entrepreneur(s)	Incubators	Financial institutions	Private company/person	Formal agencies	Research/education institutions
Articulator	7 %	19 %	7 %	0 %	7 %	7 %	4 %
Builder	8 %	6 %	20 %	0 %	17 %	22 %	16 %
Co-Creator	5 %	3 %	5 %	0 %	26 %	3 %	2 %
Cooperator	1 %	3 %	7 %	25 %	22 %	0 %	3 %
Evaluator	24 %	11 %	7 %	25 %	16 %	13 %	11 %
Experience creator	10 %	8 %	17 %	0 %	28 %	3 %	11 %
Expert	7 %	8 %	2 %	0 %	38 %	3 %	9 %
Hinderer	0 %	0 %	0 %	25 %	1 %	12 %	2 %
Instigator	15 %	13 %	12 %	0 %	13 %	0 %	4 %
Investigator	0 %	10 %	0 %	0 %	0 %	0 %	0 %
Mentor	2 %	0 %	10 %	0 %	13 %	3 %	14 %
Networker	11 %	15 %	5 %	25 %	17 %	5 %	8 %
Promoter	8 %	3 %	7 %	0 %	4 %	28 %	16 %
Total # of roles for actor group	11	11	11	4	12	10	12

As pointed out previously, the results do not contradict previous research regarding the activities and resources assumed by the respective groups of actors. Rather, the results reflect the findings from the literature which indicate that formal agencies primarily act as promoters, builders, and evaluators by providing resources such as infrastructure, funding, increased support for networking, and approving of BM choices. They also hold the role of the hinderer by rejecting an application, as in our interviews four of the founders did not receive financial and infrastructural support because their BMs were not considered innovative enough in terms of technological innovativeness.

Albeit on a slightly lower level, the roles of formal agencies also apply to research and education institutions although their function as a mentor is equal to that of the promoter and builder. As mentors, research and education institutions provide mental support and act as reference persons for any questions and uncertainties. They also include contacts that help the new venture get things done.

Financial institutions have taken up four roles in exactly equal proportions, namely that of the cooperator, evaluator, hinderer, and networker. Their primary function is associated with funding BM ideas and taking up the function of lobbying within their existing network to build trust among potential investors. At the same time, they take on the role of the evaluator and hinderer, as they have to assess whether and to what extent a new venture should receive supportive resources.

While private companies and persons take on the functions of almost all roles except for those of the investigator and hinderer, the results indicate that private companies' function as experts clearly exceeds their other support activities. Most notably, they provide resources such as jointly developing prototypes or products, sharing specialised competences such as knowledge and skills, giving impulses to make changes to a BM, and sharpening the founder's view on their BM.

Civil society has the central role of the evaluator, followed by the instigator. Family and friends are mainly consulted regarding their opinion and thus not only evaluate a BM but also significantly influence the subsequent decisions of a founder. This is not surprising as entrepreneurship often runs in families and entrepreneurs can thus relatively easily tap initial feedback and input about a business idea (Rosenblatt et al., 1985).

Finally, the results show that incubators primarily act as builders and experience creators. The interviewees mentioned that start-up hubs are especially visited to exchange information and knowledge in different areas of expertise. Founders can profit from the experiences, failures, and perceptions of other start-ups and from the opinion of the hub's administration persons. Founder 16 explained that the business incubator she is involved in contributes to networking by regularly inviting people from the public and private sectors who not only give informative talks but also want to exchange thoughts with the founders on their business ideas.

The two roles that have not yet explicitly been mentioned, namely that of the articulator and the investigator, are primarily taken on by the entrepreneurs themselves. Not surprisingly, it is mainly the entrepreneurs who promote their business idea and initiate the development of an actual BM. However, it is rather surprising that the role of the investigator was taken up exclusively by the founders themselves and by no other group of actors. While founders occasionally apply research such as interviewing to get the necessary information, they have no

support in these activities. The results suggest that founders depend on their own devices to obtain case-specific information or to check existing knowledge.

Role Ambidexterity

Ambidexterity refers to an organisation's ability to pursue two disparate goals at the same time (Gibson & Birkinshaw, 2004, p. 209). Thus, it refers to the ability of companies to use existing competences and to discover and develop new competences, methods, or technologies. According to O'Reilly and Tushman (2008, p. 189), ambidexterity is the ability of a company to simultaneously research (*exploration*) and optimise (*exploitation*) to be adaptable in the long term. Exploitation refers to the exploitation of existing potentials and the efficient further development of existing processes, products, and services, while exploration involves tapping new potentials and capabilities and developing disruptive innovations. Furthermore, many studies on ambidexterity focus on large organisations, although there are some studies dealing with ambidexterity in young start-ups (Korpysa, 2021, pp. 28–29). The author considers that ambidexterity can contribute to finding a repeatable and scalable BM and that innovative ambidexterity in start-ups also determines the development of new solutions. His findings indicate that concerning ambidexterity, start-ups to a large extent rely on external sources when implementing innovation processes. Thus, the creation of a new BM requires new ventures to involve multiple resources which they do not have in their early stages. Such resources need to be provided by the external environment. Similarly, Müller et al. (2019, pp. 290–291) assert that entrepreneurs connect their own competencies with those of actors in their external environment. The authors found that start-up team members assess when and how to access the knowledge and competencies of the surrounding open-minded, supportive, and result-oriented individuals outside their venture. Thus, start-ups achieve ambidexterity by enacting competencies, which include the ability to balance exploitation and exploration.

Gibson and Birkinshaw (2004, p. 209) propose two different forms of ambidexterity, namely structural and contextual ambidexterity, which both require different orientations of a company. Structural ambidexterity is used to explain how organisations manage trade-offs between conflicting demands by creating dual structures, which mean that certain business units focus on exploitation while others focus on exploration. Based on this, Nyström et al. (2014, p. 487) suggest a specific type of contextual ambidexterity which they label *role ambidexterity*. According to the authors, role ambidexterity indicates that actors in open innovation networks

simultaneously pursue role-making and role-taking (see chapter 3.2.1 for an explanation of role-making and role-taking). This paper's results indicate that the findings by Nyström et al. (2014) can be applied to the context of BM design in new ventures. The results showed that founders represent ambidextrous individuals who orchestrate how the start-up team members and external individuals enact competencies. It is also shown that actors internal and external to the venture pursued both role-taking and role-making:

There was a six-page article about my company in a trade magazine a few months ago. As a result, someone from a marketing agency got in touch with me. In principle, he no longer needs to earn money, but is now close to retirement age and does the projects he feels like doing on the side. He told me that he really likes my BM idea and wants to support it. I can now ask him anything. [...] And he also questions my BM, e.g., 'What are the developments?', 'Is there anything new?', 'I have another idea [to tell you about]'. (Founder 10)

Mr. [D] [from a local research institution] provided impulses on how the whole platform could be further developed, or rather, what it might have to offer, what else could be done. At the beginning, he said, 'great idea, but you could take it much further'. [...] He understood our business idea right from the start. He was totally enthusiastic. He had quickly thought through the idea and made suggestions to develop the idea further. (Founder 1A)

The interview excerpts illustrate that both private persons and persons from research institutions are assigned to act as experts or experience creators of the venture's BM design. Yet, instead of waiting for the founders to ask for specific support, the actors in the excerpts became actively involved in idea generation and questioning the BM. If the actors actively want to change something around the BM, they need to change their taken roles into active mentor or evaluator roles by making their role. This can turn the role-making and role-taking processes upside down, as actors external to a new venture take the initiative in support activities instead of giving support when the founders request it. Hence, the actors in the BM design process need to take and make their roles (i.e., balance exploration and exploitation of competencies) to best benefit the progress of a venture's BM. In line with Nyström et al. (2014), it can be concluded that from the perspective of role theory, the results imply a process in which an actor first receives a role (structural approach), then starts to transform the role to perform certain

activities that are required to enhance a BM approach (symbolic interactionist approach) and align with the actor's own goals (resource-based approach) and actions (action-based approach).

Role Reciprocity

Reciprocity refers to the fact that relationships between actors' positions and roles in the BM design process can be reciprocal. This suggests that an actor's role leads to a certain position in the BM design process, and, conversely, that the position leads to a specific role. This suggestion is aligned with Brass et al.'s (2004, p. 809) analysis of networks and organisations from a multilevel perspective which shows that networks create outcomes that are, in turn, antecedents for further network development. For instance, the position of a start-up hub manager leads to a role in which the actor orchestrates and promotes all activities within the hub, e.g., to provide the necessary infrastructure, support through individual coaching, and pass on their experience to founders by helping them to implement BMs. This promoter also invites other actors to visit the start-up hub (e.g., private companies) to hold presentations and give coaching. Thereby, the hub manager assigns roles to these actors and engages them in a role-taking process.

Probably everything would have been different if we hadn't met [the start-up's hubs managers]. They help[ed] us with all kinds of things, like legal things [...] but also all the other things, like 'What else should I do?', 'Are there any ideas how I could develop this further?', or 'do you maybe know someone I could ask?' [...] I see the advantages [of this start-up hub], especially in the support you get and the many business contacts to establish, including with politicians. Socializing is sometimes the most important thing. [In the hub] are often events of various kinds, including Hackathons. At these events, we have made many contacts with companies and they have been able to give us new input and make further contacts. Companies [...] really like to join such events and it's easy to get into a conversation. (Founder 16)

This excerpt shows that once actors have adopted their given roles, they can reflect whether their given roles or another role or position would serve them and the start-ups better. Hence, a private company that comes to visit a start-up hub and becomes familiar with all involved people and start-ups can end up establishing a new role for itself as a builder or expert for one or the other venture. Consequently, reciprocity leans on the structural approach of role theory,

in which an actor receives a predefined role. It also aligns with the resource-based and action-based approach, in which actors adjust their own goals and actions.

Role Temporality

The empirical analysis indicates that the actors' roles can change during the BM design process. Nyström et al. (2014, p. 488) suggest that actor roles may change due to new practices or the modes of action in innovation development. Consequently, actors can enter and exit a network. This paper's findings align with the outcome of Nyström et al.'s (2014) research and show that different actors influence the BM of a new venture at different stages in the pre-seed phase. Actors may drop out of a new venture's ecosystem and new actors enter the ecosystem. This finding is also in line with Dedeheyir and Seppänen (2015) who illustrate the shift in actors in their analysis of the copper production ecosystem. The ecosystem experienced a transition in ecosystem leadership from universities in the early period to copper production firms in a later period. Exemplarily, most of the founders in this paper's study assigned themselves self-acting to almost all roles at the beginning of the design process (except for the role of the cooperator and mentor). The reason for this is that the entrepreneurs surveyed mostly did not have established contacts to support them at the start but the founders gradually transformed their taken roles into more active roles by making their role, e.g., transforming their articulator role into the role of the expert or researcher by informing and educating themselves.

As the issue of temporality needs some further research considering the different stages of the pre-seed phase, two further studies were conducted. Consequently, role temporality will be illustrated in more detail in the third research project. In this part, the roles and their appearance in relation to different stages of the pre-seed phase of the BM design process are analysed.

5.2.5 Discussion of the Results

Theoretical implications

This study contributes to the discussion on role theory by highlighting actor roles and characterising role patterns in the pre-seed phase of BM design in new ventures. The roles mean that actors are active to various extents and contribute to BM design in different ways.

A total of 13 actor roles were found that all actor groups involved in the context of BM design can adopt or create. These roles partially correspond with previous research on customer and actor roles in an innovation context, as discussed in chapter 3.2.2. Nine of the roles can similarly

be found in previous research, including the co-creator, evaluator, experience creator, expert, instigator, mentor, promoter, builder, and networker (see table 18, chapter 5.2.4.1). Even though these roles are comparable to roles found in previous research, they are not identical to the characterisations of the roles in the context of the BM design of new ventures. The four completely new roles include the articulator, co-operator, hinderer, and investigator. Therefore, this study's findings both confirm roles reported in prior literature and identify previously unknown roles. While some roles show similarities (e.g., the builder and the networker) the findings also shed light on the different specific contributions underlying these roles that especially support entrepreneurs in finding ways to mobilise individuals and make use of role heterogeneity.

Furthermore, a variety of role dynamics were identified. These role dynamics include the frequency with which the roles became visible, the type of influence the roles have on a new venture, which roles were taken by which actor groups, and four patterns including role multiplicity, ambidexterity, reciprocity, and temporality. These roles' dynamics contribute to the discussion on role sets (Biddle, 1979) and help to explain how new ventures, which are characterised by uncertainty and financial constraints, design a BM. The role dynamics also show that role behaviour in BM design is more unpredictable and dynamic than it might be in established firms, by including a more diverse set of actor groups to be successful. In addition, it is not known how easy it is to change a role and how to convince other actors to expect and accept different role behaviour.

The study also contributes to entrepreneurship literature by showing how actors, who are involved in a new venture's ecosystem, engage in more roles than the ones they are officially assigned to. For example, formal agencies are not only involved in administrative activities but also act as promoters, builders, and evaluators, providing resources such as infrastructure, funding, increased support for networking, and approval of BM choices. They also occupy the role of the hinderer when rejecting an application. This reflects the versatility of theoretical approaches to role theory, in that roles are either taken by an actor to hold the expectations that map the expectations of others or are made or played by an actor who changes a role through their individuality and actions. Accordingly, the roles may correspond with what would be expected from an actor using roles while contributing to BM design and include how they act in innovations to benefit others, i.e., entrepreneurs. Hence, what this study provides is a set of important roles in BM design and, with these roles, some characteristics of the actor groups

who can fill those roles. Accordingly, this study is less concerned with status, position, or hierarchy, and more with getting the right people on board who can help drive each critical role and task. Significantly, actors not only fit one but multiple roles and the aim is thus not to find an individual person for each role, but rather to ensure that each role is covered throughout the whole process of BM design.

Furthermore, the study contributes to innovation literature by structuring actor behaviours into roles and thereby providing an overview of actors and actor groups in innovations in the specific context of BM design. The role concept allows for a discussion on what would be expected from which actors and how each actor group adds or transfers to other roles in innovation. In addition, regarding roles and characterisations, this study extends the discipline of product innovation management and open innovation which also focus on individuals essential for a successful innovation process (Agogué et al., 2013; Bucherer et al., 2012).

The data also demonstrates that actors may have several roles at the same or at different stages of the pre-seed phase within a BM design process. Similarly to this finding, previous research has discussed roles in different stages of the innovation process (Heikkinen et al., 2007). While the previous study in project I used the stage model of Wirtz and Thomas (2014) and Wirtz and Daiser (2018) to structure the research findings, an in-depth analysis of the actor roles at different stages is beyond the scope of project II. Hence, to fully understand the extents and contributions of the identified roles, they must be analysed according to different stages of the pre-seed phase. Further research and fine-grained analysis of different stages of the pre-seed phase are needed in addition to an exploration of temporality and dynamism between the stages. More systematic research is required to address questions such as at what stages of the pre-seed phase which actors are the most important, the most active, have the most influence, and are played by which actor groups. In addition to this, it could also be the case that the roles overlap between the stages and each stage may also contain several roles. In conclusion, it is essential to give a sequence dimension to the role concept. Longitudinal case studies could provide new insights into the key stages of the pre-seed phase, including the activities and actors and how they influence these stages.

Limitations

The research choices in this study also created some limitations. In accordance with the limitations of the first study, this study only focused on entrepreneurs that are based in Germany. More research is to be done with a larger sample and with a focus on different countries. Future studies may also seek to collect data from other individuals than entrepreneurs as key actors, e.g., partners, customers, and investors, as the perceptions of the entrepreneurs are not necessarily equivalent to the perceptions of external actors.

Furthermore, the constellation of the roles is context-specific. Although some roles (e.g., the expert) show the potential of being generic, other roles for designing a BM are context-specific (e.g., the investigator). Therefore, studies analysing actor roles in other types of BMI processes, e.g., at a later phase, are needed to compare the results.

Moreover, this study did not aim to determine which of the 13 roles are more beneficial to the new venture's BM and/or to the actor performing the role. Future studies that could relate the roles to the outcome of the final BM would be of managerial and theoretical importance. It is also of interest to contrast the effectiveness of each role from different actor groups for the same role. For example, whose inputs, e.g., research institutions, customers, or partners, are most effective for designing a BM? What are the differences in the impact of positive or negative role behaviours from different actor groups?

6 Project III: Temporal Classification of Actor Roles in Business Model Design

The sixth chapter of this paper presents the last of the three research projects. The conceptual and empirical preliminary work in chapter 5, which gave a detailed understanding of actor roles in BM design, forms the basis for the temporal classification of actor roles in BM design. The objective is to provide a comprehensive list of actor roles along a timeline which will enable actors to plot the sequence of their emergence and the sequence of activities they enact that are necessary to traverse the pre-seed phase of the BM design process.

Research project III is divided into two studies, which both aim to answer the fourth research question: In what stages of the pre-seed phase do actors play which roles? To this end, both quantitative and qualitative data were collected. Both studies follow the generic process model by Wirtz and Thomas (2014) and Wirtz and Daiser (2018) and conceptualise the BM design process as the span of time that stretches from an initial analysis stage to deciding for one BM. Considering the dynamic nature of BM design, the studies contend that actors can enact different roles over time, and further, that the intensity of participation of a particular role may vary throughout the stages of the pre-seed phase. It is suggested that the roles overlap between stages and that each stage may also contain several roles.

The following chapter gives an overview of the methodology of study I. Subsequently, the contents of study I and its resulting findings are presented. Afterwards, the methodology of study II is presented, which is followed by this study's findings. The chapter will end with a combined discussion on studies I and II.

6.1 Study I

6.1.1 Methodology

A qualitative case study research approach was deployed because case studies are appropriate when a researcher has little or no control over events and when contemporary phenomena with longitudinal, real-life contexts are investigated (Yin, 2003). The principal data collection method in the case studies was through interviews, which are an appropriate method to obtain

retrospective and real-time data on the experience of actors (Gioia et al., 2013). The interviews are analysed with the help of process analysis. Before theoretically explaining the procedure of process analysis, this paper will give an insight on when and how to deploy case studies.

6.1.1.1 Case Studies

Case studies as a scientific research approach must be distinguished from the colloquial use of the term in the sense of anecdotes, case examples, storytelling, or business cases for teaching purposes (Borchardt & Göthlich, 2009, p. 34). Two key approaches guide case study research; one proposed by Stake (1995) and the second by Yin (2003). In their essence, both approaches seek to ensure that a certain topic is well explored and the essence of a phenomenon is revealed (Baxter & Jack, 2010, p. 545). Yin (2003, pp. 13–14) defines case study research as follows:

A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident. [...] The case study inquiry copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result relies in multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result benefits from the prior development of theoretical propositions to guide data collection and analysis.

Thus, case study research focuses on an in-depth and detailed examination of a subject of study (the case), in which a researcher seeks to understand the dynamics that are present within a specific setting (Loureiro et al., 2020, pp. 394–395). It is an intensive study about a person, a group of people, or a unit, which is aimed to be generalised over several units (Gustafsson, 2017, p. 2). Thereby, qualitative case studies seek to advance theoretical and empirical knowledge and must be discounted from quantitative methods as they do not aim to be statistically representative (Lubik & Garnsey, 2016, p. 398).

Researchers must also distinguish between single and multiple case study approaches because they are used for different purposes:

- *Single case study*

Case studies are characterised as single when they include only one case (Gustafsson, 2017, p. 3). Thereby, a single case study aims to understand the phenomenon in detail (Baxter & Jack, 2010, p. 550).

- *Multiple case study*

Case studies are characterised as multiple when they include more than one case (Gustafsson, 2017, p. 3). The advantage of a multiple case study is to understand similarities and differences between individual cases and compare elements or conceptualisations between cases (Baxter & Jack, 2010, p. 550). This is in line with the proposition of Yin (2003), who assert the ability of case studies to analyse data within and across situations.

Albeit the advantages of single and multiple case study approaches, Dyer and Wilkins (1991, p. 618) point out that there is no guarantee for gaining rich theoretical insights, neither by the conduction of a multiple nor by a single case study. Furthermore, Yin (2003) categorises case studies into three different types, namely explanatory, exploratory, or descriptive case studies:

- *Explanatory*

An explanatory case study is used if the aim is to answer a question that sought to explain the presumed causal links in real-life interventions that are too complex for a survey or experimental strategy.

- *Exploratory*

An exploratory case study is used to explore those situations in which the intervention being evaluated has no clear, single set of outcomes.

- *Descriptive*

A descriptive case study is used to describe an intervention or phenomenon and the real-life context in which it occurred.

After deciding on a single or a multiple case study approach and defining the type of case study, the researcher(s) must present the findings in a specific way, so that the case study is easy for the reader to understand. To effectively organise the data, Baxter and Jack (2010, p. 554) encourage the use of a database such as Atlas.ti or CAQDAS (Computer Aided Qualitative Data Analysis Software) to improve the reliability of the case study as it allows researchers to track and organise data sources including notes, key documents, tabular materials, or narratives for easy retrieval at a later date. The conclusion sought with a case study can be either illustrative or confirmatory (Gustafsson, 2017, p. 3). The possibilities for reporting a case study are to deliver a chronological report, tell the reader(s) a story, or attend each intention (Gustafsson, 2017, p. 5).

6.1.1.2 Process Analysis

Process analysis is an appropriate method to evaluate case studies and can be used to analyse and describe changes that occur over a series of individual phases (McGrath et al., 2019, pp. 216–217). The work of van de Ven (1992, p. 169) offers an instructive formal definition of what a process is. He asserts that literature most often uses a process in three ways, namely: (1) as a logic used to explain a causal relationship in a variance theory, (2) as a category of concepts that refer to activities of individuals or organisations, or (3) as a sequence of events that describes how things change over time. Pettigrew (1997, p. 338) argues that of these three approaches on defining a process, “only the third explicitly and directly observes the process in action and thereby is able to describe and account for how some entity or issue develops and changes over time”. Following this argument, the author defines a process as “a sequence of individual and collective events, actions, and activities unfolding over time in context” (Pettigrew, 1997, p. 338). This definition is in line with previous research of Pettigrew in which he states that process research has a fluid character that spreads out over both space and time (Pettigrew, 1992, pp. 7–8). More precisely, process research is concerned with understanding how things evolve over time, why they evolve in a certain way, what happened, and who did what when (e.g., activities, decisions) (Langley, 1999, p. 692). The driving assumption behind these questions is that social reality is not a steady-state but rather is a dynamic process that occurs rather than merely exists (Pettigrew, 1997, p. 338).

The aim of process analysis is to conceptualise events (e.g., a bad year, a merger, a decision, a meeting, or a conversation) to detect patterns among the events that are commonly a linear sequence of phases that occur over time to produce a given result (Rogers, 1983). It further presumably attempts to compare the shape, character, and incidence of the patterns between cases (e.g., in case A compared to case B) (Pettigrew, 1997, p. 339). In addition, there is a quest to find the underlying mechanisms that shape and drive the patterns in the observed processes (Pettigrew, 1997, p. 339). To achieve these aims, researchers combine historical data collected through the analysis of documents and retrospective interviews with present data collected in real-time (Langley, 1999, p. 693). While historical data is rather sparse and synthetic because it focuses on memorable moments and broad trends, present data is mostly richer and more finely grained (Langley, 1999, p. 693). According to Langley (1999, p. 694), the central (and main) challenge lies in “moving from a shapeless data spaghetti toward some kind of theoretical

understanding that does not betray the richness, dynamism, and complexity of the data, but that is understandable and potentially useful to others”.

Furthermore, Langley (1999, pp. 691–692) identifies several difficulties about process data characteristics that researchers should take into account when analysing and manipulating process data of real organisational contexts. Langley (1999, pp. 691–692) explains that process data mainly deals with sequences of events that are conceptual entities with which researchers are less familiar. Furthermore, process data often involves multiple levels and units of analysis whose boundaries are ambiguous. As another difficulty the authors explain that the temporal embeddedness of process data often varies in terms of precision, duration, and relevance. Finally, Langley (1999, pp. 691–692) find that despite its primary focus on events, process data tends to be eclectic, drawing in phenomena such as changing relationships, thoughts, feelings, and interpretations.

A tool that can be used for a visual representation of process data and events is timelines or lifelines. Timelines are often used in combination with qualitative interviews and case study research (Berends, 2011; Pettigrew, 1997). Berends (2011, p. 2) describes a timeline as “a visual depiction of a life history, where events are displayed in chronological order”. She argues that timelines facilitate data management and enable insightful analysis (Berends, 2011, p. 3). Hence, timelines serve as one method to visually organise rich narrative data and are constructed by highlighting events of interest in an individual or company’s life in chronological order (Patterson et al., 2012, p. 135). The significance and meaning of events may also be highlighted and ideas can be communicated to others (Berends, 2011, p. 3). Relating to lifelines, Gramling and Carr (2004, p. 207) argue that they facilitate the recollection and sequencing of personal events and are useful for comparison with other data (e.g., interviews, focus groups), to confirm and complete a life history. Based on the identified events and patterns in the data, displays can be constructed that incorporate both descriptive elements (e.g., what happened, how participants felt) and interpretive components (e.g., causal relationships between separate events) (Berends, 2011, p. 3). This offers the possibility to provide a concise, holistic overview of the accounts participant(s) experience.

6.1.2 Longitudinal Case Studies

In the present study, the stories of the development of two new ventures, referred to as Alpha and Beta, are presented. The studies are used to suggest which actor roles are apparent in what stages of the pre-seed phase. In the next chapters, the two cases are introduced, followed by a description of the data collection and analysis. Finally, the results of the analysed case studies will be presented and discussed.

This study relies on two illustrative case studies for the inquiry (Eisenhardt, 1989; Miles & Huberman, 1994). This approach enables the development of inferences (Siggelkow, 2007), and the suggestion of avenues for further theory-building and testing (Eisenhardt & Graebner, 2007). Because relatively little is known about the phenomenon under investigation in the present context, case research is proposed to be suitable to generate theoretical insights (Eisenhardt, 1989, p. 546). To increase the validity of the results, two case studies were chosen instead of a single case study (Yin, 2011). Furthermore, a descriptive case study approach was chosen, because a contemporary phenomenon with a longitudinal, real-life context was to be analysed, namely the influence and behaviours of actors along the early process of designing a BM.

6.1.2.1 Case Selection

Purposive sampling is employed to select information-rich cases that can reveal insights into issues of importance to the inquiry (Mason, 2002). Cases were selected that share similar features because this allows for meaningful comparison in the cross-case analysis and increases the likelihood that similarities and differences between cases have theoretical relevance (Gerring, 2007). Two start-ups, Alpha and Beta, were chosen for analysis, because they were founded in the same geographical region in Germany, and face highly similar institutional contexts. It was important for both cases to be situated early on in the development process of their BM (i.e., still in the pre-seed phase), and to not yet have a clear idea of what their BM would look like, nor to have entered the market yet. This requirement was met by both Alpha and Beta.

Both start-ups are university spin-outs or academic spin-outs, which means that they were founded by university personnel to produce a commercial benefit from the results of academic research. University spin-outs are often considered a fruitful mechanism for commercialising

academic knowledge, fostering innovation, and stimulating economic growth (Bathelt et al., 2010; Mustar et al., 2008). For these reasons, numerous initiatives have emerged at both national and local levels to promote university spin-outs at public research institutes and universities (Fini et al., 2017; Meoli & Vismara, 2016). Both spin-outs aim to bring technological innovation to the market and are therefore subject to similar starting conditions (e.g., the same potential investors for funding) and requirements (e.g., development of a prototype). They differ in their offerings, in that Alpha offers an innovative interactive online platform while Beta offers a high-tech product. The founders of both ventures had been active in the local region for quite a long time and had already built up strong private networks in both business and politics. This enabled them to be part of the local community, e.g., for knowledge exchange. Alpha and Beta were also chosen for the study because the researchers contacted the founders when they were still in their early pre-seed phase, and it was possible to meet them in person due to local proximity. This enabled the collection of detailed information on the development of the BMs over a longer period, from the early emergence stages up to the phase in which they entered the market. Due to the above factors, the two ventures fitted well with the research focus of this study. The following will provide more detailed information on the two start-ups:

- The first case, *Alpha*, is a knowledge-intensive high-technology venture operating in the field of architecture. Alpha offers a web-based application with which constructions can be built and managed based on databases. The start-up is located in the centre of a medium-sized city in Germany. The venture was founded by a team consisting of three entrepreneurs who also represent the initial employee base. Its business idea was developed when two of the three founders were employed as professional researchers at the university. The starting point was in 2016 when the two founders identified the great potential for improvements in their daily work with students. Subsequently, they tried to find a solution to facilitate the students' everyday working life. Within its niche market, Alpha's BM is an interactive network platform for architects, engineers, construction product manufacturers, and for all those involved in planning and construction processes, thus creating an unprecedented digital offer in the field of architecture. The third founder joined the team about a year after the idea was born in 2016.

- The second case, *Beta*, is a high-technology manufacturing venture operating in the field of composite materials. Beta offers an innovative production technology for the manufacturing of wheels made of fibre plastic composites. It is also located in the centre of a medium-sized city in Germany. The venture was founded by a team consisting of three entrepreneurs who also represent the initial employee base. Before founding the new venture in 2018, two of the three founders worked as professional researchers at the university. However, at the time when the Beta start-up was launched, only one founder was still working at the university while the other two founders were employed in the same industrial concern. The launch was initiated by only one of the founders, who also represents the main founder. He had the innovative idea for how to produce car wheels more efficiently from fibre-plastic composites. Beta's BM is an innovative manufacturing technology that specifically addresses the disadvantages of conventional manufacturing methods.

6.1.2.2 Data Collection

The data was collected over a period of 3 years for each venture. For Alpha, the period lasted between November 2017 and June 2020. For Beta, the period lasted between August 2019 and October 2021. The data collection is primarily based on official interviews with the founders. The aim was to ensure comparability with project II, and thus the entrepreneur's perspective was mainly taken to analyse the role concept in a time frame. However, to support the data of interviews with the founders, further interviews with external actors were also conducted. In total, 10 official interviews were conducted with the founding teams (six interviews) and representatives of the local structure, e.g., employees of the university's foundation office who participated in activities at both ventures (four interviews). It was only possible to find external actors that participated in both cases because both ventures are located in the same city, and thus they were supported by nearly the same group of local actors. These external actors were selected based on referral sampling through recommendations by the two founding teams themselves. The interviews with the founders were conducted at longer intervals, i.e., half-yearly or yearly. The interviews with the external actors took place in 2018 and 2019. All interviews were conducted in situ. The interviews with the founders lasted approximately 1 hour, while the interviews with the external representatives lasted approximately 30 minutes.

The interviews were all based on a semi-structured interview guide that was adapted individually for each respondent. In general, the procedure of the interviews followed the criteria already outlined in the data collection of project I (e.g., starting with a simple initial question). The interviews focused on tracing the BM development and the actor roles in different parts and at different times of the BM from the founders' perspectives. Thus, the interviews focused on the ventures' BMs and the model development from the initial starting point to market entry, thereby mapping important events, all involved actors, and BM development reasoning. The questions addressed the respondents' activities and behaviours as well as the activities and behaviours of other involved actors that the interviewees could describe. Further questions addressed changes to the ventures' BMs, the entrepreneurs' networks, and the ventures' progress. Information from the first interviews (e.g., ideas regarding the pricing model) was repeated in follow-up interviews and checked to see what changes had occurred. In addition, the main researcher ensured that the respondents specified exactly at which points in time which changes to the BM took place, which factors triggered these changes, and which actors were responsible for, influenced, and supported these changes. All primary data were audio-recorded and transcribed verbatim. Transcription followed the rules outlined in chapter 4.2.2 (table 5). Table 23 provides more details on the interviewees' profiles and the average duration of the interviews. At the time of the last interviews, both ventures had not finalised their BM yet, but they were still developing some of its components.

Table 23: Case study interviewees' profile

Interviewees' position		Interviewees' business area	Duration of interview
Alpha	One founder of the founding team	Founders of a web-based application with which constructions can be built and managed based on databases.	1 hour, 40 min
	Founding team		31 min
	Founding team		46 min
Beta	Main founder	Founders of innovative production technology for the manufacturing of wheels made of fibre plastic composites.	1 hour, 2 min
	Founding team		52 min
	Founding team		39 min
Employee at start-up incubator		Technology and start-up centre that helps founders develop their business idea.	50 min
Platform designer at German Institute for Artificial Intelligence		Consultancy and developer of the online platform back- and front-end design.	16 min
Employee at university foundation office		Central contact point and free support for students, employees, and founders from the university and the surrounding research institutes who have an idea or the desire for more knowledge on the topic of start-ups.	32 min
IP Consultant		Professional service provider in innovation protection and management.	21 min

In addition to the official interviews outlined in table 23, numerous unofficial conversations took place between the main researcher and the founders of both ventures. This kept the main researcher consistently informed about the current state of both ventures. Important selected information was recorded in handwritten notes and complemented the interview material. This helped the researcher to plan the follow-up interviews. In addition, e-mail communications determined when new interviews might be useful. The data were further triangulated by combining interviews with archival data such as press releases, which were published by the university and local and national magazines. Access to the daily e-mail traffic or to meetings of the start-ups was not possible.

6.1.2.3 Data Analysis

This study adopted a process research approach (Langley, 1999) to analyse the ventures in-depth. The ventures' development processes are documented as a sequence of activities and events that describe how things developed over time (van de Ven, 2007, p. 197). Halinen et al. (2013) conceive events and chronology as the essential components for the construction of a case analysis. The chronological order of the respective events further supports the establishment of a temporal logic and thus facilitates the analysis.

A historical description of each venture was created, based on the information from the semi-structured interviews. The researchers created a timeline for each venture on which they plotted what appeared to be the key events and activities. The benefits of timelines include the combination of aural and visual data, along with the concise and holistic form of presentation (Berends, 2011; Harper, 2002). However, the use of timelines also means a loss of richness in individual portrayals of experience (Berends, 2011). The timelines for this study's cases follow an annual interval. Each timeline starts with the first product idea and ends with the last event or activity that was recorded by the researchers. For Alpha, the timeline extends beyond the market entry, as the company has continued to make adjustments to its BM. Beta's timeline ended before the actual market entry with the last interview of this study.

The idea of *Alpha* was born in 2016 when two of the founders identified the great potential for the more efficient processing of architecture projects in their daily work with students at the university. In the same year, the founders presented their idea of an interactive architecture platform to representatives of the industry, where they made initial contacts and received their first feedback. The potential of the idea was immediately recognised and further thought was given to it. Different actors noted that not only students but every architect could benefit from the BM. This quickly resulted in negotiations with investors who wanted to support the founders to turn the idea into an initial prototype. However, because these proceedings failed, the founders applied for the EXIST scholarship, which they received in 2017. EXIST is a German federal new venture support programme. This is the largest new venture support network initiative in Germany, founded by the Federal Ministry of Education and Research in 1998 with a funding volume of approximately €50 million over a period of 6 years. With the help of EXIST, a first BM draft was created. In addition, the first employee was hired to support the development of a platform prototype. A beta version of the platform was ready by the end of 2017. When the EXIST funding ended in 2018, the founders managed to obtain further funding from an investment bank in the same year. Through the exchange with numerous actors, further potentials in the BM were identified at the end of 2018. Consequently, the BM was adapted to achieve even more profit. The actual market entry was in 2019. Through new partnerships with industry representatives and new investors in 2020, the BM was expanded for the second time, whereby the goal for the end of 2020 was to retain the original BM and supplement it with additional components. This included a cooperation with industry representatives for whom the founders could fulfil some projects. After the last interview, however, negotiations with the cooperation partners were still in progress. The actual long-term success of the company is still unknown at the time of writing. The timeline of Alpha is shown in figures 10.

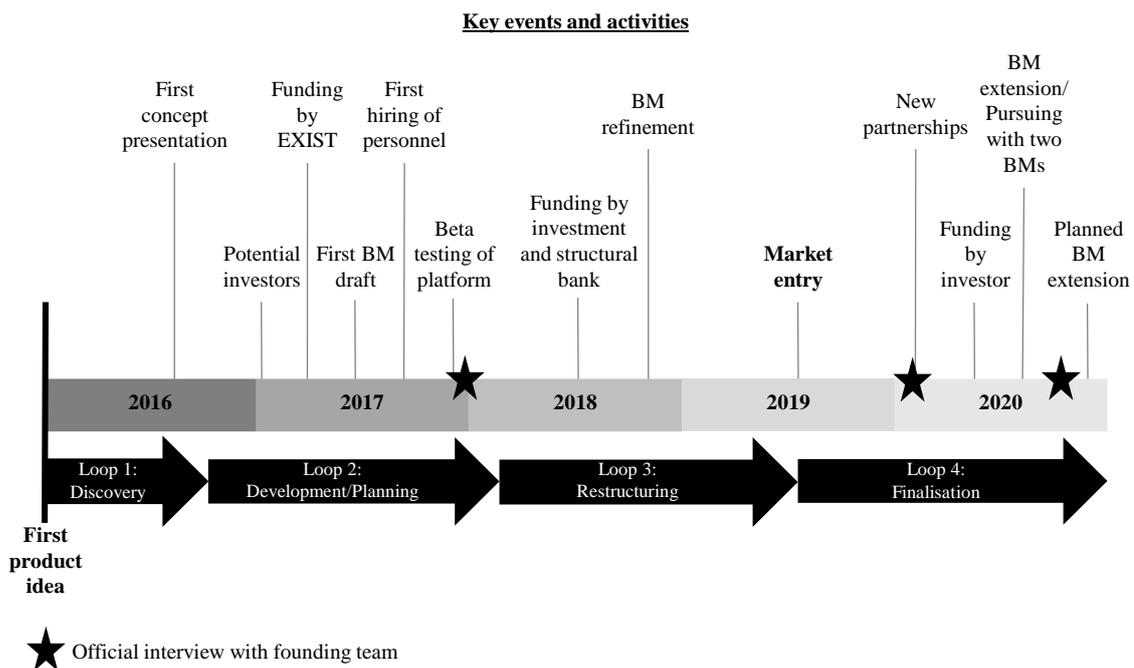


Figure 10: Timeline of Case 1—Alpha

The foundation of *Beta* was initiated in 2018 by one of the founders who had an innovative idea for how to produce car wheels more efficiently from fibre-plastic composites. In the same year, the founder put together a team. At that time, the main founder had already started negotiations with potential customers about a partnership. These customer contacts were already established during the time when the main founder was still an employee at an industrial company. The founders and the potential customers both saw great potential in the idea, whereupon it was decided to embark on the founding process together. A first BM draft was set at the beginning of 2019. This BM draft was prepared by the second founder who had the necessary business expert knowledge to conceptualise a BM. In mid-2019, Beta also received EXIST funding to build a prototype. At the end of the year, to the regret of the founders, the proceedings with the potential customer about a possible partnership were discontinued, as the ideas regarding the direction of the BM were too far apart. From the founders' point of view, it was not possible to comply with the customer's specifications. The year 2020 was clouded by two streaks of bad luck for Beta. First, Beta suffered from a computer virus that paralysed the company's operations for quite some time. Then, Beta's progress was severely hampered by the onset of the COVID-19 pandemic. The founders were unable to participate in important trade fairs and events to present and promote their idea to an audience and find investors. Due to these two crises, the founders radically changed their BM and switched their product from the B2B to the

business-to-consumer market. However, the original BM for the B2B market was not shut down completely; it was to be continued at a later date. Accordingly, the founders are still working with two BMs that run parallel to each other. The success of the BMs is still unclear, and the market entry is planned for 2022. The timeline of Beta is shown in figures 11.

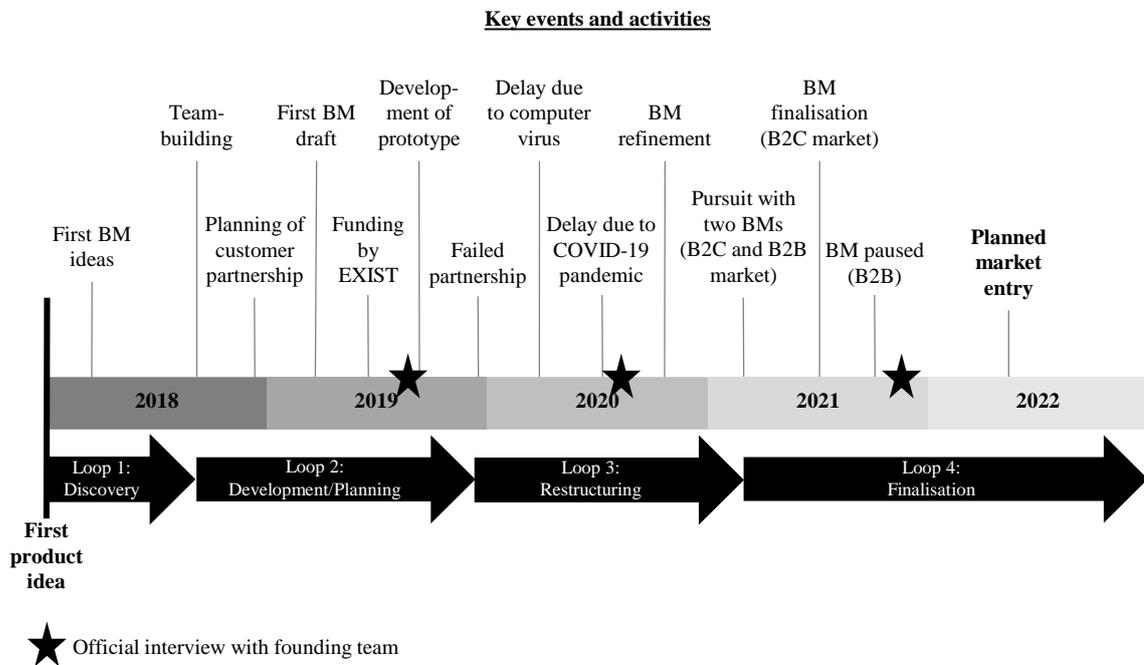


Figure 11: Timeline of Case 2—Beta

Based on the historical description constructed for each case, coding was done for whether and when the BMs of the two ventures in the sample changed. When starting to analyse the large amount of data obtained, the main researcher and one student assistant researcher acknowledged that they already had formed a pre-understanding of what happened in the cases. To capture the dynamic development process of the two ventures, the timeline for each venture was first divided into sequential loops (see figures 10 and 11). This means that the data was organised according to the date, dividing it into four *loops* from the beginning of the BM development process to that of entering the market. The delineation of the loops is based on the goals of the founders, upheavals in their BM ideas, and actions that caused changes in the development of the BMs. For example, both start-ups were participating in the EXIST program. The funding by EXIST offered Beta new opportunities, which at the same time led to an upheaval of its BM and hence a new loop for Beta begins shortly after being funded by EXIST. Although the two ventures differ in age, they had both gone through similar loops in their development path. Therefore, uniform names for the loops could be found for both ventures:

discovery, development and planning, restructuring, and finalisation. Discovery describes the initial phase of the start-up in which the business idea is first conceptualised. During the development and planning phase, a first BM draft is created. In the restructuring phase, the first BM is modified based on positive or negative environmental influences (e.g., opportunities for further development of the BM, crises), while the decision for a final BM is made during finalisation.

Afterwards, the chronology was built around five *stages*: analysis (stage 1), ideation/feasibility (stage 2), prototyping (stage 3), decision-making (stage 4), and implementation (stage 5) (Wirtz & Daiser, 2018; Wirtz & Thomas, 2014). Because each venture altered the key components of its BM several times in response to opportunities or feedback from its environment, they also went through several adjustments to their BM and passed through the five stages several times. In response, the researchers iteratively analysed all stages for each loop with the result that each of the five stages is named four times in the coding process which means that each stage appeared in each loop. For example, the researchers introduced the code “Loop 1_Stage 1” or “Loop 2_Stage 1”. To code this five-stage process description in the four loops and to analyse the roles of the actors in each stage, the researchers imported the original, word-by-word interview data into the programme Atlas.ti. For the coding of the roles, the role concept developed in project II was used, including all 13 roles. The analysis of the longitudinal data provided the path for the researchers to explore the dynamic process of how the actors’ activities and behaviours spread and evolve from a temporal perspective and when these actors take on different roles. This procedure enabled the researchers to investigate both within-case variation over time and cross-case variation (Gerring, 2007).

The reliability of the findings is enhanced by carefully describing the data collection procedure. The use of the computer-aided analysis tool Atlas.ti also improved the systematic sorting and searching for the pre-defined codes in the data (Kelle, 2004). The validity of the findings is enhanced by ensuring that the data was obtained from appropriate sources, i.e., by carefully selecting the cases (Healy & Perry, 2000).

6.1.2.4 Results

The analysis shows that the stages in the BM design process of a new venture are not arranged in a strictly linear fashion and that the process is characterised by loops and iterations. However, despite these iterations between the stages, the process seems to be rather structured overall. Four major iterative loops were detected to build the timelines (discovery, development and planning, restructuring, and finalisation). Multiple factors (e.g., experiences made during realisation, resource constraints, negative feedback) evoked adjustments of a BM because the founders recognised that a planned idea or design did not work in real life or that not all terms and conditions had been considered. Thus, the loops seem crucial for a new venture to finally develop a BM that can be successfully implemented.

From the data analysis, it was also evident that over time some roles became more prominent than others. Consequently, these roles had a stronger influence on the design of the BMs because they brought in more resources. In this sense, the results illustrate the strength of appearance of all actor roles in each stage of each loop.

In the following, the cases will be discussed in detail regarding their within-case and cross-case variations. First, the prevalences in the results of Alpha will be disclosed, followed by the results of Beta.

6.1.2.4.1 Description of Case 1—Alpha

A matrix analysis was used to compare the prevalence of actor roles along the five process stages. The case analysis of Alpha indicates that along the five stages the number of actor roles highlighted in the interviews varies. Table 24 illustrates the prevalences of all actor roles across the five stages for which the stages are summarised across all loops as an overview. For a detailed illustration of the roles across the stages in each individual loop, see appendix 1.

Table 24: Summary of the prevalences of the actor roles at each stage at Alpha

	Analysis	Ideation/ Feasibility	Prototyping	Decision- making	Implemen- tation
Articulator					
Builder					
Co-creator					
Cooperator					
Evaluator					
Experience Creator					
Expert					
Hinderer					
Instigator					
Investigator					
Mentor					
Networker					
Promoter					

0 quotes	1–2 quotes	3–5 quotes	6–9 quotes	≥ 10 quotes
----------	------------	------------	------------	-------------

As can be seen from table 24, apart from the mentor, hardly any of the actor roles only acted in a single stage during the process. The role of the mentor is the only one that only became apparent during prototyping. One explanation for the relatively minor appearance of the role of the mentor could be the professional career and prior knowledge of the founders. Due to their academic background that was shaped by the special requirements of higher education institutions and public research institutes, the three founders of Alpha already had the skills and competences to carry out the necessary analyses and research by themselves in the initial stages. In addition, in the architecture industry in Germany, it is common to work in a commercial office at the same time as pursuing an academic career, which also applies to the founders of Alpha. Two of the founders had gained the necessary knowledge and experience from industry in parallel to being researchers at the university.

In contrast, the role of the experience creator is the most dominant and was highlighted 6–9 times for the analysis, ideation/feasibility, and prototyping stages. Significantly, it is the only role that appears across all five stages. However, when examining this role in detail for each loop separately (see appendix 1), the experience creator does not appear in every stage of every loop but only appears in the first three loops in one or two stages and in the last loop in the first four stages. Nevertheless, this prevalence still signals the great importance of the role which can be explained by the fact that those holding this role have the all-embracing task of sharing their opinions, perceptions, and experiences and thereby influencing the experiences,

perceptions, and preferences of other actors. This allows them, e.g., to describe their personal impression of a situation or show new ways in which business partners could be acquired. This role can be taken by any actor at any time, because neither expertise, specific experience, nor a large personal network is required. Roles such as the experience creator are likely to be pivotal in ensuring that a BM can successfully move from discovery to commercialisation. Following the experience creator, the roles of the articulator, instigator, and investigator indeed appeared in four of the five stages. These three roles seem to be more important in the initial stages, while they are only partly highlighted for the final stages.

Furthermore, particularly the task-oriented roles seemed to be important when Alpha started with their BM idea and during the final implementation stage. The three network-oriented roles, namely that of the builder, cooperator, and networker, only appeared during the central stages of ideation/feasibility, prototyping, and decision-making. One explanation for this is that network-oriented roles become more important as soon as financial and infrastructure support or professional business advice is needed.

The results also indicate that all actor roles are only prevalent during prototyping when the BM design alternatives are generated and evaluated. The task during this stage is to find a BM that works, in other words, to prove that the BM can compete in the market. In contrast, during analysis and implementation, the fewest roles are mentioned. This is also not surprising, as founders have commonly not yet built a strong network of supportive actors at the initial stages and such relationships only form with time. At the last stage, Alpha had determined a final BM and no further adjustments to the BM had to be made at that time as the founders had already handled most financing, infrastructure, and potential cooperations and hence no longer relied on the support of external actors.

A similar picture emerges from a closer look at the individual loops (see appendix 1). The comparison of the loops clearly shows that in loop 2, which covers the actual development and planning of the BM, most roles are prevalent. Simultaneously, the roles are also mostly present in the three central stages in loop 2. The general picture of the prevalence of the roles given in table 24 thus reflects that of loop 2. A plausible explanation for this is that loop 2 reflects the phase in which the actual design process takes place, i.e., when the idea is actually converted into a BM. The subsequent loop of restructuring (loop 3), however, cannot be assumed to be generally accepted for all cases as some start-ups may skip this loop and directly enter the loop

of finalisation. One of the decisive reasons for the restructuring of Alpha's BM was due to the impact of the COVID-19 pandemic.

Overall, the results of the empirical analysis for Alpha highlight the dynamic nature of roles and the fact that they can very rapidly change from one stage to another. The results also highlight that a single role can act in more than one stage.

6.1.2.4.2 Description of Case 2—Beta

The case analysis of Beta also indicates that the number of actor roles varies over the five stages detailed in table 25. For a detailed illustration of the roles across the stages in each individual loop, see appendix 2.

Table 14: Summary of the prevalences of the actor roles at each stage at Beta

	Analysis	Ideation/ Feasibility	Prototyping	Decision- making	Implemen- tation
Articulator					
Builder					
Co-creator					
Cooperator					
Evaluator					
Experience Creator					
Expert					
Hinderer					
Instigator					
Investigator					
Mentor					
Networker					
Promoter					

0 quotes	1–2 quotes	3–5 quotes	6–9 quotes	≥ 10 quotes
----------	------------	------------	------------	-------------

A very similar picture can be drawn for Beta as for Alpha. First, and even more extreme than for Alpha, it became apparent at Beta that the mentor role is not present at all which can be explained by the professional career and prior knowledge of the founders. The two founders of Beta have an academic background that was shaped by the special requirements of higher education institutions and public research institutes, and thus already had the skills and competences to independently carry out the necessary analyses and research in the initial stages. Furthermore, two of the founders had worked for an industrial company that merchandised a product similar to the start-up's product before founding their own venture from which they

gained the necessary knowledge, experience, and especially contacts to the industry prior to starting their venture.

Similar to Alpha, the role of the experience creator is the most evident and was mentioned more than 10 times for the stage of prototyping. Following this, the roles of the cooperator, instigator, and promoter appeared in four stages. The two roles of the co-operator and the promoter seem to be more important in the final stages and are not mentioned for the initial analysis stage. Actors taking the role of the cooperator actively cooperate with a start-up to achieve common goals and exploit synergies, e.g., sharing production facilities to reduce costs or promoting the joint development of new products. Actors taking the role of the promoter support the establishment of a start-up with financial, infrastructural, and material resources, e.g., with investments, subsidies, equity, or office space. The importance of these two roles can firstly be explained by the fact that Beta envisaged selling its product to intermediaries, and therefore needed to find cooperation partners. Furthermore, since Beta's product is only a component of a whole product, they are dependent on finding cooperation partners who would integrate their component into the final end product or, alternatively, provide them with the individual parts so that Beta could assemble the final product itself. In addition, it was of great importance to Beta to find investors because they require large sums of money to build the necessary production halls and prototypes for their product.

The results also show that similar to Alpha, the central stages of ideation/feasibility prototyping, and decision-making require the most support from a variety of roles. In contrast, during analysis and implementation, the fewest roles are required. The comparison of the loops of Beta shows that in loop 2, which covers the first round of development and planning of the BM, most roles are prevalent, which is consistent with the results of Alpha. Thus again, the general picture of the prevalence of the roles in table 25 reflects that of loop 2. Similar to Alpha, a plausible explanation for this is that loop 2 reflects the phase in which the actual design process takes place. Subsequently, Beta was restructured in loop 3 due to the impacts of the COVID-19 pandemic on Beta's industry.

Overall, and similar to Alpha, the results for Beta highlight that roles very rapidly change from one stage to another. The results also show that a single role can act in more than one stage.

6.1.2.5 Discussion of the Results

Theoretical implications

The results evidenced the appearance of all roles from project II, at least for the specific context of university spin-outs. Hence, the two case studies confirm the roles previously mentioned in other innovation contexts (e.g., the co-creator role) (Agrawal & Rahman, 2015; Hering & Phillips, 2005; Nyström et al., 2014; Story et al., 2011) and the newly identified roles found in project II. The temporal classification of the actor roles explains which actors and resources the founders should direct their attention to during BM development, which may help them to make decisions about their BM (Reymen et al., 2017).

In addition, it was possible to illustrate the roles from a temporal perspective and present which roles are most prevalent in which stages of the BM design process. The results indicated that the experience creator, in particular, is present in most stages, whereas the mentor plays a subordinate role. Furthermore, and in line with Snihur et al. (2017, p. 4), one important implication of this study is that entrepreneurs must learn and profit from interactions with external actors throughout all stages of the BM design process (Minniti & Bygrave, 2001) and that there is no stage in which no external actors (roles) appear.

A further important conclusion is the multidirectional character of the BM design process. Instead of being a sequential, linear procedure, the results evidenced that the BM design process is rather a semi-structured flow of activities and events that can always lead to adjustments of an initial BM due to unforeseen events (e.g., COVID-19 pandemic, loss of potential partnerships). This finding exemplifies the assessment of the generic process according to Wirtz and Daiser (2018, p. 53), who also assume that the BMI process is characterised as being semi-structured and includes loops. However, it is important to note that it is not an essential prerequisite that each BMI initiative covers all of the four loops identified for this study's cases (discovery, development and planning, restructuring, finalisation). Depending on the requirements of each BMI initiative, some BMI stages and/or loops may be passed several times, and some not at all. Wirtz and Daiser (2018, p. 53) recommend that the initial planning of a BMI initiative should always start with an extensive process that takes all stages and possible loops into account and that each decision concerning deviations from this plan or upcoming variances from the course of the BMI initiative should always be based on a holistic BMI process perspective.

Limitations

While the case selection supports the research motivation and outcome, the restricted context limits the generalisability of the findings to the context of university spin-outs in Germany. Future research should study other contexts, such as start-ups that develop from an idea on the market, start-ups that represent spin-outs of industrial companies, or social start-ups. Due to the different starting conditions such as different knowledge bases, networks, or funding opportunities, it is assumed that the prevalence of the roles may differ throughout the stages. For example, social start-ups are very different from university spin-outs, as they do not have access to EXIST funding, which is only intended for technical innovations, nor can they benefit from the university-wide network and its experts. This argument is also underlined by Bower (2003, p. 99) who supposes fundamental differences between founders with an academic background and those with an industrial background. Founders who have already worked in an industrial firm are very familiar with the industry and sector environment. Academic founders from university spin-outs, on the other hand, have skills and competences that are shaped by the special requirements of higher education institutions or public research institutes, while they lack experience in industry or business activities (Bower, 2003, p. 99).

In addition, both cases are located in the same city in Germany. Bramwell et al. (2019, p. 275) argue that “substantial differences in regional outcomes result from different policy objectives and instrument choices as well as context-specific institutional configurations and policy path dependencies”. These regional differences may also lead to different prevalences of the roles in the BM design process stages. Future research should account for variation in the cases and analyse university spin-outs located in different cities and countries.

Furthermore, it should be noted that the impacts of the COVID-19 pandemic required both cases in this study to adjust their initial BM ideas. Especially Beta would have probably displayed a different process and a different timeframe and perhaps have developed faster without the crisis.

6.2 Study II

6.2.1 Methodology

The previous studies of this paper employed qualitative methodologies, which led to the suggestion that further research efforts based on quantitative methodologies could help to advance this research field. Therefore, a quantitative survey forms the dominant data collection process in the second section of research project III.

The objective of this quantitative descriptive study is to concretise actors and their roles in the context of BM design in new ventures. The basis for this is the role concept that was developed in research project II (see chapter 5.2.4). In project II, 13 actor roles (see table 18) were identified and characterised, which were subsequently integrated into an online survey. The aim is to put these roles into a temporary context, relate them to different actor groups, and assess their importance. The survey was analysed with the help of data analytical and statistical methods. In the following, the framework of quantitative survey methods will be outlined, followed by an explanation of the most relevant data analytical and statistical methods.

6.2.1.1 Quantitative Survey Methods

In contrast to the qualitatively oriented methods of data collection, in the case of quantitatively oriented survey methods, the questions and possible answers are more standardised, i.e., the questions posed are essentially the same for all respondents (Homburg, 2017, p. 269). In the framework of the quantitative survey methods, four different methods must be differentiated, including standardised oral interviews, written interviews, telephone interviews, and online surveys (Homburg, 2017, p. 269; Kaya, 2009, p. 51). The oral interview is conducted based on a standardised questionnaire, whereby the questions, content, and sequence are determined in advance to achieve the highest possible comparability of the individual interview results and the possible linking of the data (Homburg, 2017, p. 269; Kaya, 2009, p. 51). In comparison, respondents to a written survey receive the questionnaire by post and respondents to a telephone interview are contacted by telephone (Homburg, 2017, p. 270; Kaya, 2009, p. 51). Finally, an online survey via the internet is usually conducted as an e-mail-survey or a WWW-survey (Homburg, 2017, p. 272; Kaya, 2009, p. 51). The answers are stored in a database and can be directly exported into a statistical analysis programme such as IBM SPSS. Online surveys are

very popular because they are relatively inexpensive and cover a wide operating distance (Homburg, 2017, p. 271).

In addition to the determination of a suitable survey design, attention must be paid to the procedure for creating a questionnaire. Homburg (2020, pp. 334–343) suggests the following procedural steps for creating a standardised questionnaire:

1. Decision on question content
2. Decision on question formats
3. Decision on question formulations
4. Decision on the sequence of questions
5. Decision on the external design of the questionnaire
6. Pre-test, revision, and completion of the questionnaire

In the following, these six process steps are explained in more detail in accordance with Homburg (2020, pp. 334–343). The decision on the question content is based on the research objectives outlined in advance and is formulated considering the respondents' abilities and willingness to provide information (Homburg, 2020, p. 335). When deciding on the question formats, a basic distinction can be made between open (no predefined answer categories) and closed (single/multiple selection[s] of answer categories) questions (Homburg, 2020, p. 335). When deciding on the wording of questions, attention must be paid to simplicity (avoidance of complex expressions and sentences), neutrality (avoidance of suggestive wording), unambiguity (avoidance of double questions) and relevance (focus on answerable facts) of the questions (Homburg, 2020, p. 340). In the next step, the order of the questions must follow a comprehensible structure to prevent radiation effects and to ensure that there is no influence of response behaviour resulting from the order of the questions (Homburg, 2020, p. 340). The fifth step is to decide about the external design of the questionnaire (layout). Here, a clear and appealing design of the questionnaire must be ensured, as this increases interest in the survey and gives the impression that answering the questionnaire is easy and takes little time (Homburg, 2020, p. 342). The final step includes the pre-test and the finalisation. Thereby, members of the target group are selected to assess the comprehensibility of the questionnaire, to what extent the respondents have sufficient information to answer the questions, the extent to which the answer categories cover all relevant aspects, and how much time it actually takes to complete the questionnaire (Homburg, 2020, pp. 342–343).

6.2.1.2 Data Analytical and Statistical Methods

The spectrum of data analysis methods used to evaluate surveys is very broad (Homburg, 2017, pp. 330–429). In the following, this paper will only give an overview of the data analysis methods relevant for the evaluation of the study's results, which include descriptive procedures, regression analysis, and variance analysis.

By definition, *descriptive methods* only allow statements to be made about the available data set (Homburg, 2017, p. 329), which enables insights into the data structure and distribution (Homburg, 2020, p. 355). Using these descriptive methods, the determination of the one-dimensional frequency can be calculated (Homburg, 2017, p. 331). Both the absolute and the relative frequencies of the different characteristics of an attribute are determined (Homburg, 2017, p. 331). If at least one ordinal scale level is available, the cumulative frequency can also be calculated, whereby the frequency of a given characteristic itself and that of all characteristics that come before it in the ranking order are assigned to a characteristic expression (Homburg, 2017, p. 331). In practice, frequency distributions are often presented graphically in the form of bar charts or pie charts.

Regression analysis can be used to uncover relationships between a dependent and an independent variable that are both metrically scaled (Meffert, 1986, p. 74). Regression analysis is applied to quantitatively describe and explain these relationships (Backhaus et al., 2016, p. 64) whereby a one-sided dependency is assumed. The decision regarding which of the variables is to be regarded as the independent variable and which as the dependent variable depends on the plausibility and on the discretion of the investigator (Berekoven et al., 1989, p. 205). Regression models are used for multiple purposes, including data description, parameter estimation, prediction and estimation, and control of the dependent variable (Montgomery et al., 2021, p. 9).

The importance of the method for researchers is based on the fact that cause-effect relationships can be presented and measured (Meffert, 1986, p. 74). In more detail, regression analysis follows a certain sequence of steps. First, the underlying cause-and-effect problem must be mapped in the form of a linear regression function (Backhaus et al., 2016, pp. 69–71). This regression function must then be estimated empirically, based on data (Backhaus et al., 2016, pp. 73–80). In the three following steps, the estimated function must be checked concerning its quality, including the verification of the regression function, the regression coefficients, and the

model assumptions (Backhaus et al., 2016, pp. 81–111). The model assumption underlying regression analysis, i.e., the prerequisite for carrying out linear regressions, includes that linearity must be ensured in the parameters and the normal distribution of the disturbance variable must be given (Backhaus et al., 2016, pp. 99–111). In addition, the expected value of the disturbance variable must be zero and autocorrelation, heteroskedasticity, and multicollinearity must be avoided (Backhaus et al., 2016, pp. 99–111).

A one-factor *analysis of variance* can also be applied to analyse a quantitative data set. This analysis has the aim to reveal relations between nominally scaled independent variables (with different levels of expression) and a metrically scaled dependent variable (Backhaus et al., 2016, p. 174). The analysis assumes that differences in mean values signal different effects of the factor levels on the dependent variables (Backhaus et al., 2016, pp. 176–177). The prerequisites for variance analysis are a normal distribution of the population, the investigated characteristic, and the error of the observed values (Berekoven et al., 2009, p. 205; Magerhans, 2016, p. 147). In addition, an additive behaviour of the explained and unexplained variances and variance homogeneity must be given (Berekoven et al., 2009, p. 205; Magerhans, 2016, p. 147). With an F-test and a significance level of $\alpha = 5\%$, the presence of various influences of different factor levels can be tested for significance (Backhaus et al., 2016, pp. 182–183). The F-statistic can be used to determine the p-value, which is defined as the probability “that an F-distributed random variable (with df_1 and df_2 degrees of freedom) is greater than the empirically determined F-value” (Backhaus et al., 2016, p. 184). In this context, analysis of variance (ANOVA) is used to test for significant differences between groups. The starting point is the null hypothesis which suggests that there are no mean differences between groups (Backhaus et al., 2016, p. 184). The null hypothesis can be rejected and the alternative hypothesis (mean values between the groups differ significantly) can be accepted, if the significance of the test variable is $< 5\%$ ($p < \alpha$) (Backhaus et al., 2016, p. 184). Thus, it is possible to determine whether there is a significant influence. Afterwards, different post-hoc tests can be employed, whereby the choice for a given test depends on the data set itself (e.g., data size).

6.2.2 Quantitative-Descriptive Study

A quantitative-descriptive research design is applied to approach the final research question, namely “In what stages of the pre-seed phase do actors play which roles?” The objective of this study is to concretise the actor roles that were identified in research project II. This includes to:

- clarify whether the identified roles can be confirmed or revised,
- determine which actor groups take which roles,
- identify in which process steps of BM design each role occurs, and
- determine how the importance of the roles and the extent of participation (active, passive) are assessed.

Following this objective, an online survey was prepared. The process of setting up this survey, the associated data collection, and the evaluation of the survey will be explained in the following. Afterwards, the results will be presented, illustrated, and discussed.

6.2.2.1 Conception of the Questionnaire

To determine a suitable survey design, the procedure for creating the questionnaire according to Homburg (2020, pp. 334–343) was consulted. In terms of content, the questionnaire aimed at concretising the actors and their roles in the context of the BM design of new ventures. Concerning the format, apart from a few open questions, closed questions with predefined, simple answer categories were mainly used. Furthermore, open input fields (“others” or “other actors”) for several questions ensured that the respondents could provide additional information. The questionnaire was divided into three main sections:

- Section I—General questions: Collection of general information that relates to the new venture. This includes questions about the industry, the year of foundation, the size of the founding team, the spatial dimension (in which the new venture operates), and the number of employees (currently employed by the venture).
- Section II—Questions relating to role theory and role concept: In this part, the research objectives are addressed, and questions are asked relating to the 13 actor roles. These questions address which actor groups represent which roles, in which process step the respective roles are found, and how the importance of the roles is assessed (importance, extent of participation).

- Section III—Questions on demographics and sensitive data: The last part of the survey deals with the personal data of the participants, their gender and age, as well as sensitive information about the annual turnover of the new venture in the 2019 financial year.

The survey is presented in its final form in appendix 3. When participants went to the survey site, they first saw an introductory page explaining the purpose of the study. Participants completed 49 questions that were spread over several pages to make them easy to answer. Each page included only as many questions as could easily be viewed on a single screen using a standard 15-inch monitor. Definitions of all terms were provided on each page to ensure that the respondents understand the questions. In appendix 3, the questions from section II are depicted in a simplified way, which means that the questions are only presented for a general actor role and role description. This structure can then be transferred to all 13 roles.

The industry sectors in section I were compiled based on different internet sources to ensure completeness of the industries (Bundesministerium für Wirtschaft und Klimaschutz, 2020; Statista, 2020; Statistisches Bundesamt, 2020; Trainee.de, 2020; Wirtschaftsforum, 2020). The categories for the questions concerning the year of foundation, the size of the founding team, the spatial dimension, and the number of employees were discussed and determined based on the experience gained by the researchers during the qualitative interviews in research projects I and II.

The role descriptions that were implemented in section II refer to the 13 actor roles that were developed in research project II (see chapter 5.2.4). Table 26 gives an overview of all 13 roles and their descriptions as they appeared in the final questionnaire.

Table 26: Actor roles and role descriptions

Actor role	Role description
Articulator	The actor encourages to develop an initial loose business idea into a clearly articulated, comprehensive description of a BM
Cooperator	The actor actively enters into a cooperation with another enterprise or works with another company to achieve common goals and exploit synergies, e.g., sharing production facilities to reduce costs or promoting the joint development of new products.
Co-creator	The actor is involved in the configuration and definition of a BM and supports the creation of different feasible BM designs and the development of prototypes of the product or service.
Evaluator	The actor examines and evaluates the different BM designs of the start-up company. For example, the actor assesses whether and how long a BM can survive on the market. This can include both positive and negative assessments.
Experience creator	The actor shares his/her own opinion, perception, and experience and thereby shapes the experiences, perceptions, and preferences of other actors. This includes, e.g., describing one's personal impression of a situation or pointing out new ways of acquiring business partners.
Expert	The actor provides professional skills, necessary know-how, or expertise, e.g., in a sector or industry. The actor is an expert in a certain field, is particularly knowledgeable, and shares this extensive knowledge or these special skills.
Builder	The actor builds up business relationships and business networks and mediates between public institutions or private companies and the start-up company or establishes contacts at trade fairs or start-up meetings.
Instigator	The actor is actively involved in decision-making processes and/or actively makes decisions, e.g., when choosing a certain price model, the actor has a decisive influence on the decision and/or helps to decide which BM to choose.
Investigator	The actor conducts research and informs himself/herself in different ways about different topics and available options, e.g., by gathering information about competitors or possible cooperation partners.
Mentor	The actor takes time and serves as a contact person and advisor to other actors on various issues. The actor has the ability to look beyond the status quo and reveals new possibilities and options concerning the BM. Usually, the actor has many years of experience in entrepreneurship or in a specific sector/industry.
Networker	The actor forwards private and personal contacts and creates trust in a start-up, e.g., he/she arranges contacts with people from the private sphere such as friends, family, or colleagues. The actor thus actively promotes the formation of network formation.
Promoter	The actor supports the establishment of a start-up with financial, infrastructural, and material means, e.g., with investments, subsidies, equity capital, or office space.
Hinderer	The actor shows no accommodation, i.e., has a general aversion to the BM. The actor is difficult to convince of the BM, questions it, and expresses criticism, e.g., discourages further development of the BM or denies access to networks or funds.

The actor groups that were examined in section II included the founder/the founding team, civil society, private and commercial companies/individuals, federal agencies (public and governmental institutions), research and education institutions, non-profit organisations, and the broader public. These categories of actor groups were, on the one hand, determined using the results from research project II and on the other hand, by building on the categories identified in the results of Butzin and Terstriep (2018) and Aarikka-Stenroos et al. (2014). If a

role was not taken on by any of these actor groups, the respondent was given an additional answer option of “no one”. If the role applied to actors that were not yet named in the options, an open text field was provided for “other actors”.

The process steps of the BM design process in section II are geared to the generic BMI process by Wirtz and Thomas (2014, pp. 44–46) and Wirtz and Daiser (2018, p. 51). Accordingly, the process steps were represented by and summarised into five stages:

- Stage 1—Analysis of the environment and uncovering of the business idea
- Stage 2—Getting an overview of information and determining the BMI vision
- Stage 3—Creation and analysis of potential BM alternatives
- Stage 4—Evaluation and refinement of BM alternatives
- Stage 5—Selection and realisation of the BM

The last stage by Wirtz and Thomas (2014, pp. 44–46) and Wirtz and Daiser (2018, p. 51) was excluded from the questionnaire because this study only focuses on the pre-seed phase of BMI in new ventures, and hence the controlling and monitoring stage is not of great importance for this paper’s final research question.

The questions in section III correspond to a common formulation and categorisation of personal data in questionnaires and common statistics, e.g., the scale for the annual turnover was set by the researchers using statistical overviews from platforms such as Statista (2022). This section ended with a final open-ended question inviting additional comments.

Furthermore, to generate no bias effects, the 13 actor roles in section II were presented in a randomised order. In total, the three main sections contain 231 questions, 226 of which are closed questions (including 13 questions with an input field about “other actors”), four open questions and one closed question with an open answer option. In addition, 213 of these questions are mandatory questions. Most questions (221 out of 231) are placed in section II. All items in this section are rated using a five-point Likert scale ranging from strongly agree (1) to strongly disagree (5) with a sixth option for “don’t know”, to avoid incorrect or unsure answers. When deciding on the design of the questionnaire, great importance was attached to a clear and simple design. In addition, the respondents were informed about the current state of completion of the questionnaire by means of a progress bar showing the percentage of the survey that has been completed.

Finally, the questionnaire was subjected to a pre-test and a subsequent revision. In the pre-test, three research fellows and survey experts were asked to test the questionnaire to ensure that participants could easily understand the instructions and questions and that they could complete the survey without technical errors. This step was given great importance to reduce the number of comprehension problems, which are difficult to overcome due to the communicative limitations of online surveys in general. Pre-tests were conducted in three rounds with the research fellows and experts. The pre-tests led to several changes in the wording and order of the questions, to ensure that the respondents understood the questions. As a result of the feedback received, redundancies were eliminated, and the purposefulness of the questionnaire was improved.

6.2.2.2 Data Collection and Sample

The quantitative survey method used in this study was an online survey. The reasons for choosing an online survey are numerous and include: the relatively low costs, the high coverage (regionally and in terms of quantity), directed data collection, increased response validity and reliability due to a high degree of standardisation and formalisation, improved linkage of the collected data, rapid data evaluation, adherence to question order and completeness, increased acceptance due to flexibility and anonymity of respondents, and no direct interviewer influence (Berekoven et al., 2009, p. 328; Homburg, p. 72). These advantages generally outweigh the disadvantages of online surveys, which include the risk of bias due to self-selection of the participants, the lack of control over the representativeness of the respondents, the high level of refusal to answer and willingness to provide information, the problem of spam, and the lack of explanatory possibilities to facilitate the understanding of questions (Berekoven et al., 2009, p. 328; Homburg, p. 72). The questionnaire was developed and implemented with Unipark, Questback's academic programme.

Furthermore, when collecting data, a distinction must be made between a census (full survey) and a sample (partial survey) (Magerhans, 2016, p. 70). A population contains all potentially investigable units that have a matching characteristic or a matching combination of characteristics (Raithel, 2008, p. 54). In contrast, a sample only includes a subset of all units of study that represent the relevant characteristics of the population as closely as possible (Raithel, 2008, p. 54). Conducting a full survey is generally not possible when acting on the assumption of a large population, because of the time required and the high costs that are involved

(Homburg, 2020, p. 80). In 2019, when the survey was conducted, 70,000 start-ups existed in Germany alone, which represents a very large population (Metzger, 2020, p. 1). Consequently, the present study resorted to the use of a partial survey.

The target population for this study were the founders of new ventures in German-speaking countries (Germany, Switzerland, Austria), who had been significantly involved (e.g., as the initiator of a business idea) in the respective start-up project. Start-up companies were characterised by their age (less than 10 years old), had to offer an innovative range of services or use innovative technology, and must have had a recognisable growth in terms of turnover or number of employees (Kollmann et al., 2016, p. 15; Schramm & Carstens, 2014, p. 11). The sample frame from which founders were invited to participate was obtained from three sources: a database of start-ups from an internet search, a database gained through LinkedIn, and a database of founders from Prolific.

In a first step, the founders were selected by the systematic sampling method, whereby the study units are specifically selected according to explained characteristics (Homburg, 2020, p. 80). These characteristics correspond to the characteristics of start-up companies outlined above. By means of an internet search via the portals startupdetecor.de, deutsch-startups.de, mystartups.de, gruendungsbuero.info, für-gründer.de, deutsche-startups.de, and deutscherstartup-monitor.de, 142 potential start-up companies were identified, and the contact details of the companies and founders were recorded. The identified potential respondents were contacted by e-mail and invited to complete the online survey, which was provided in German. The e-mails were sent out directly through the programme Unipark. The invitation letter indicated that to be eligible to participate in the study, the respondent must be knowledgeable about aspects related to the process of BM design. A donation was made by the main researcher for every completed questionnaire to thank respondents for their participation. In addition to a cover letter, the invitation e-mail also included an access hyperlink to the survey on Unipark (www.unipark.com) and an individualised access code, which the participants could use to take part in the survey. This allowed the researchers to draw conclusions about which access codes were still unused.

The cover letter included the following information:

- Who the survey was addressed to: the founders.
- The aim of the study: Survey of founders to gather their subjective assessment of the central actors and their roles in the development process of a new BM. For this purpose, the respondents needed to currently be active in the process of founding a new venture.
- The founders were informed that the type of company and the size of the company were not relevant.
- Duration of the survey: The survey would take about 15 minutes to complete.
- Note on anonymity and data protection and the handling of the collected data.

To read the full cover letter, see appendix 4.

After 1 week, the start-up companies whose deposited access code had not yet been used were contacted via a reminder e-mail and again asked to participate in the survey. Access to the survey was then open for a further week. In total, the online survey was active for 2 weeks (between 22 October and 4 November 2020). Of the 142 start-up companies that were contacted, a total of 16 founders completed the survey. Accordingly, the response rate for the survey is 11.27 %. Although the response rate is higher than 10 %, the number of responses was not adequate to proceed with the data analysis and generate a meaningful result. Hence, it was necessary to extend the survey and continue with the data collection.

In a second step, the data set was supplemented with additional data that was generated via two different media tools, LinkedIn and Prolific. LinkedIn is a web-based social network for maintaining existing business contacts and making new business connections. A LinkedIn Premium account was used to research the contact details of further potential respondents and subsequently to contact them. The potential start-ups that were to be contacted via LinkedIn were filtered through the Bundesverband Deutsche Startups e. V. association. The homepage of this association lists a directory of members with numerous start-ups based in Germany (status of March 2021: 1,078 reported start-ups). Both the name and the location of these start-ups are listed in the directory. With the help of the Microsoft Excel programme, 604 contacts could be listed at the end of the review of the directory. All 604 contacts were then entered in the search field on LinkedIn. The listed data of the start-ups were then matched with the data provided on LinkedIn. In addition, the Excel table was completed with additional data, including the founding year, the size of the venture, and the industry sector. Since the aim of

the study was to analyse young ventures in the pre-seed phase, organisations that were founded more than 8 years ago were sorted out and hence the Excel table only lists start-ups with a founding year up to and including 2012. In the next step, a networking request was sent to the selected start-ups, including a short message. Because the text field for networking is limited to 280 characters, the short message was set up as follows:

Dear Mr XY, or Dear Ms XY,

I am doing my doctorate at the TU Kaiserslautern and would be happy if you would help me with my dissertation and participate in a study in which you assess the roles of actors in the development process of BMs for start-ups before market entry.

Many thanks.

Best, Marketing Chair, TUK

If the networking request was accepted, a second letter was sent that corresponds to the e-mail from the first round of questioning. Of the 604 contacts, 590 were successfully contacted after an exclusion procedure (e.g., due to incorrect information or an earlier founding year than 2012). Out of this, 288 founders accepted the request for networking and in the end, 20 founders participated in the online survey, which corresponds to a response rate of 3.3 %.

Further data was generated via Prolific, a professional website that specialises in academic surveys. Prolific offers the possibility to pre-select participants based on characteristics that the participants must fulfil to take part in the survey. The selection criteria in Prolific included only German-speaking founders. Overall, 31 founders participated in the survey through Prolific.

With the help of these two media, a greater overall data set was created for the subsequent evaluations and analysis. The larger number of participants made it possible to better represent the basic population. In the end, a total of 67 respondents took part in the survey. The answers of all 67 respondents were recorded in an electronically stored raw data set, which was reassessed and edited for quality assurance purposes. This was done to ensure the validity and comparability of the collected data. The responses from start-ups with a year of foundation older than 2012, a completion time of fewer than 10 minutes, or a monotonous response behaviour were removed from the data set. A minimum completion time of 10 minutes was set based on the empirical values from the pre-test from which it was assumed that an adequate and conscientious answering of the questionnaire could not be guaranteed in under 10 minutes. Because of this adjustment, nine participants had to be eliminated, which resulted in an effective sample of 58 participants.

6.2.2.3 Data Analysis

The statistical evaluation was carried out in two steps. In the first step, the collected data set was examined using descriptive analyses. Afterwards, multivariate analyses in the form of simple regression analyses and single-factor variance analyses were conducted.

The descriptive analyses applied were chosen to record and present the aspects considered on the topic of actors and their roles in the BM design of new ventures as accurately as possible, which enables insights into the data structure and distribution (Homburg, 2020, p. 90). For individual variables (univariate), one-dimensional frequency distributions (absolute, relative, and relative cumulated) are determined for nominally and ordinally scaled characteristics (Berekoven et al., 2009, p. 190). Furthermore, the mean value (location parameter) and the standard deviation (dispersion parameter) are determined for the ordinally scaled variables (Berekoven et al., 2009, p. 190). For the ordinally scaled variables, for which Likert scales were used, an equidistant relationship between the individual points, as suggested by Homburg (2020, p. 82), is assumed. Thus, these variables are classified as quasi-metric variables and can be treated as interval-scaled data (Homburg, 2020, p. 82). The results are commonly presented in tabular form or by using bar charts.

In addition, simple regression analysis is applied to analyse the quantitative data set. The focus of the analysis in this study is the relationship between actor roles, actor groups, process steps in BMI, and the assessments of the importance of these actor roles. In this juncture, the actor roles represent the independent variable, while the actor groups, process steps in BMI, and the assessments of the importance of these actor roles represent the dependent variables. Specifically, it is necessary to check for each role whether there is a relationship between the actor groups and the steps of the BM design process and between the assessments of the high importance and the extent of participation (active, passive) of each role. In this context, the actor (actor group) under investigation is declared as the regressor (independent variable) and the respective process steps, the extent of importance, and extent of participation as the regressand (dependent variable). These relationships are described and explained quantitatively to estimate or predict the values of the dependent variable (Backhaus et al., 2016, p. 64). For statistical validation and to exclude random fluctuations, the significance values are tested at a significance level α of 5 % ($p < .05$) (Berekoven et al., 2009, p. 222). Furthermore, the prerequisites are tested and thus, if linearity in the parameters and normal distribution is given,

and if the disturbance variable and the expected value of the disturbance variable are zero. It was also tested if autocorrelation, heteroskedasticity, and multicollinearity are avoided.

Moreover, to test the influence of nominally scaled variables, two one-factor analyses of variance are carried out. The nominally scaled independent variables that are assumed to be useful to be tested are the size of the founding team and the spatial dimension. Using univariate ANOVA, the effect of the size of the founding team and the spatial dimension on the three theoretically and substantially implied variables were tested: the importance of individual actor roles, actor groups, and process steps. The verification of the required variance homogeneity is tested using the Levene test. The starting point of the Levene test is the null hypothesis, which assumes that “the error variance of the dependent variable is the same across groups” (Backhaus et al., 2016, p. 207). The predefined significance level α is set at .5 %. If the significance of a test variable is less than this value, the null hypothesis is rejected and variance homogeneity is not given (Backhaus et al., 2016, p. 207). Otherwise, variance homogeneity is assumed to be true (Backhaus et al., 2016, p. 207). If no variance homogeneity is given, i.e., the Levene’s test does not show significance, the Welch ANOVA can be used to determine statements about a significant influence of the factor levels (Field, 2013, p. 443). In this context, the Games-Howell test is selected as a post-hoc test, as it can be used in the case of variance inequality and heterogeneous sample sizes (Field, 2013, p. 459). For this study, the Scheffé test was used as a post-hoc test to assess which groups showed significant differences. This test assumes variance homogeneity in the factor levels (groups) (Backhaus et al., 2016, p. 203). The Scheffé test can be considered as being robust and applies to studies in which the sample sizes in the groups may differ (Backhaus et al., 2016, p. 203). This is of interest because all the groups examined in this study have different sample sizes. For the two post-hoc tests that are mentioned above (Scheffé and Games-Howell test), a pairwise mean comparison of the factor levels can be carried out and tested for significant results (Field, 2013, p. 459). For this, there must be significance at a level of $< .5 \%$.

Within the framework of the evaluation of the primary statistical data set, the statistical software programme SPSS 27.0 from IBM was used. The results of the data analysis are shown and summarised in chapter 6.2.2.4.

6.2.2.4 Results

The following chapters present the results of the online survey using quantitative measurement methods. First, a description of the study sample is given. The characteristics highlighted by the respondents regarding their start-ups and the persons involved are outlined. Based on this, the results of the descriptive analysis are presented, followed by the results of simple regression analysis and single-factor analysis of variance.

6.2.2.4.1 Descriptive Analysis of the Sample

The sample is first described based on the structural characteristics of the start-up firms. The final sample to be analysed comprised 58 (N = 58) founders. Only a quarter (25.9 %) of the respondents are female and three quarters (74.1 %) are male. Almost half of the respondents (46.6 %) are 30 years old or younger, with the youngest respondent aged 17 years and the oldest respondent aged 55 years. The mean age of the respondents is 32.5 years. More detailed information on the age of the founders can be found in appendix 5.

The sector classification of the start-ups turned out to be very diverse whereby the sectors of information technology and telecommunications (20.7 %), services (12.1 %), and trade and consumption (10.3 %) make up the largest share of the responses. A more detailed overview of the industry data is shown in appendix 6.

Table 27 provides an overview of further characteristics of the sample according to their absolute, relative, and cumulative frequencies. The results show that most of the start-ups in the sample were founded in 2018 (10 ventures), 2019 (14 ventures), and 2020 (12 ventures). The fact that many young founders took part in the survey is very appropriate for the context of the study. The start-ups were most frequently founded by a team of two to three founding members (60.3 %). Furthermore, 69.0 % of the participants in the sample stated that the spatial scope of their entrepreneurial activity was either regional or national. Moreover, 70.7 % of the respondents mentioned that they have five or fewer employees. Most start-ups (53.4 %) generated an annual turnover of 1 € to 150,000 € in the financial year 2019.

Table 27: Descriptive analysis of firm characteristics (N = 58)

Attribute	Characteristic	Absolute frequency	Relative frequency	Cumulative frequency
Foundation year	2012	1	1.7	3.4
	2014	1	1.7	12.1
	2015	5	8.6	20.7
	2016	2	3.4	24.1
	2017	7	12.1	36.2
	2018	10	17.2	53.4
	2019	14	24.1	77.6
	2020	12	20.7	98.3
	2021	1	1.7	100.0
Size of founding team	1	17	29.3	29.3
	2–3	35	60.3	89.7
	4–5	6	10.3	100.0
Spatial dimension	Regional	20	34.5	34.5
	National	20	34.5	69.0
	Europe-wide	7	12.1	81.0
	Global	11	19.0	100.0
Number of current employees	1–2	15	25.9	25.9
	3–5	26	44.8	70.7
	6–10	11	19.0	89.7
	11–20	3	5.2	94.8
	>20	3	5.2	100.0
Age of respondent	≤25	16	27.6	27.6
	26–30	11	19.0	46.6
	31–35	11	19.0	65.5
	36–40	9	15.5	81.0
	>40	11	19.0	100.0
Gender of respondent	Female	15	25.9	25.9
	Male	43	74.1	100.0
	Diverse	0	0	100.0
Annual turnover in 2019 (in €)	No annual turnover	10	17.2	17.2
	1 to 150,000	31	53.4	70.7
	150,000 to 500,000	9	15.5	86.2
	500,000 to 2 million	7	12.1	98.3
	10 million or more	1	1.7	100.0

6.2.2.4.2 Descriptive Analysis of the Roles

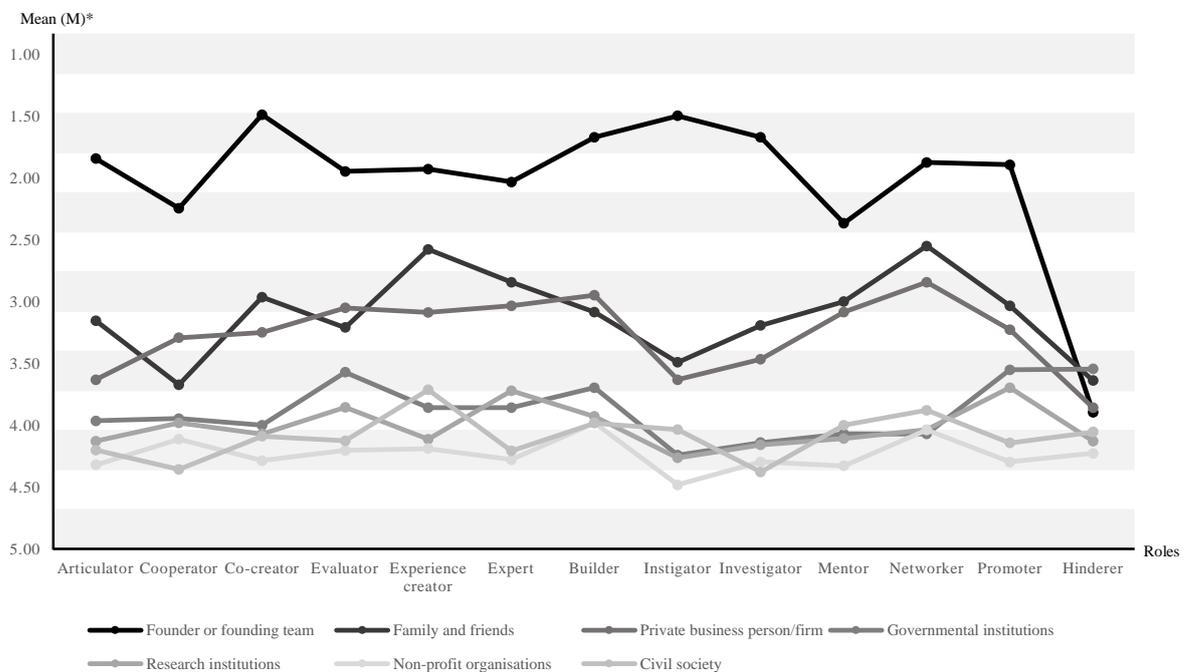
The descriptive analysis does not refer to the descriptive statistics of each individual role but provides an overview of the cross-role results for all roles. For each role, the respondents were asked to give their assessment concerning which actors had taken on each role and in which stages the respective role was present. The respondents were then asked to rank the importance of each role and its active and passive influence in the BM design process. Results are indicated by mean (M) and standard deviation (SD).

First, the degree to which the individual actor groups had taken on the roles are discussed. A consistent picture emerges across all roles. The consensus is that the founders themselves are the actors who take on all roles, whereby the confirmation that the founders take on the role of the co-creator (M = 1.49; SD = 0.909) and instigator (M = 1.50; SD = 0.996) is the highest. The role of the hinderer is an exception to this finding as this role is not reflected by any of the stated actor groups with a strong or rather strong agreement.

The two groups of actors that are classified as “rather agreed on” or “neither disagreed nor agreed on” are the founders’ personal environment, i.e., family and friends as well as private businesspersons or firms. Family and friends especially take on the roles of the networker (M = 2.55; SD = 1.465) and the experience creator (M = 2.58; SD = 1.149). In comparison, private business persons and firms especially take on two network-oriented roles, namely the roles of the builder (M = 2.95; SD = 1.538) and the networker (M = 2.84; SD = 1.554). This depicts that the prominent role of private business persons and firms lies in building relationships between founders and other actors and integrating the founders into existing networks.

All other actor groups were rated with “rather do not apply” or “do not apply at all” to the actor roles without any outliers. This forecloses that the actor groups including federal agencies, research and education institutions, non-profit organisations, and civil society generally do not (or only barely) take on any tasks in the pre-seed phase. They show rather little activity towards start-ups. However, this can also differ in relation to industries/markets or by focusing on different types of start-ups, e.g., university spin-outs or social start-ups. Most notably, non-profit organisations demonstrate the highest values, i.e., close to 5.00, which can be interpreted to mean that none of the roles applies to them. Figure 12 demonstrates the mean values of the degree to which the individual actor groups have taken on which roles. This graph clearly

reflects the trends of the roles. A more detailed overview of the descriptive statistics, including all mean values, standard deviations, minimum values, and maximum values, is given in appendix 7.



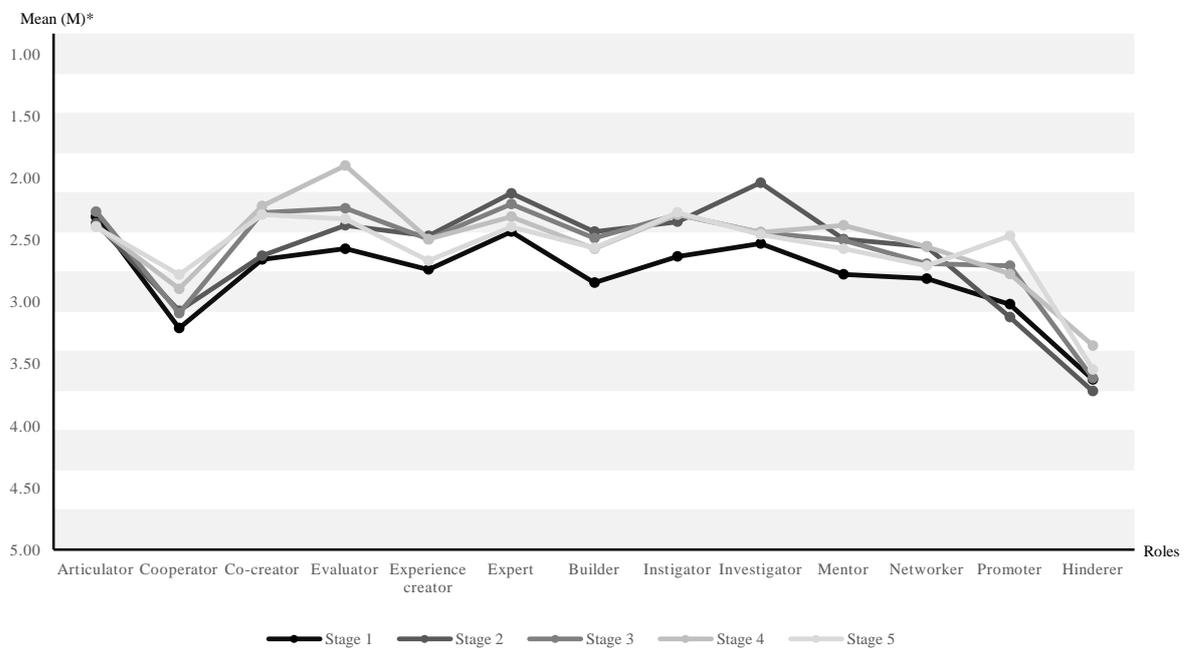
*with 1 = strongly agree to 5 = strongly disagree

Figure 12: Mean values of actor groups among the actor roles

In the next step, the degree to which the actor roles appeared in the five stages of the pre-seed phase is discussed. In stage 1, the roles of the articulator ($M = 2.31$; $SD = 1.392$) and the expert ($M = 2.43$; $SD = 1.557$) are rated with the strongest agreement. In the second stage, the respondents highlighted the investigator ($M = 2.35$; $SD = 1.343$) and the expert ($M = 2.12$; $SD = 1.352$) as being the most important roles. In the third stage, five roles were assigned by the respondents as being rather present at a similar level. These include the expert ($M = 2.21$; $SD = 1.281$), the evaluator ($M = 2.24$; $SD = 1.275$), the articulator ($M = 2.27$; $SD = 1.368$), the co-creator ($M = 2.28$; $SD = 1.348$), and the instigator ($M = 2.29$; $SD = 1.325$). In stage 4, the role of the evaluator ($M = 1.90$; $SD = 1.103$) has, in contrast to the other roles, a greater presence. Finally, in stage 5, the instigator ($M = 2.28$; $SD = 1.348$) and the co-creator ($M = 2.29$; $SD = 1.325$) are assigned the greatest presence.

Overall, across all five stages, the roles with the greatest presence include those of the articulator, co-creator, evaluator, expert, and instigator. In contrast, the role of the hinderer is by far rated as being least present. Figure 13 provides a visualisation of the mean values of the

actor roles that are present in the five process stages whereby the graph reflects the trends of each role. A detailed overview of the descriptive statistics, including all mean values, standard deviations, minimum values, and maximum values, can be found in appendix 8.



*with 1 = strongly agree to 5 = strongly disagree

Figure 13: Mean values of actor roles along the process stages

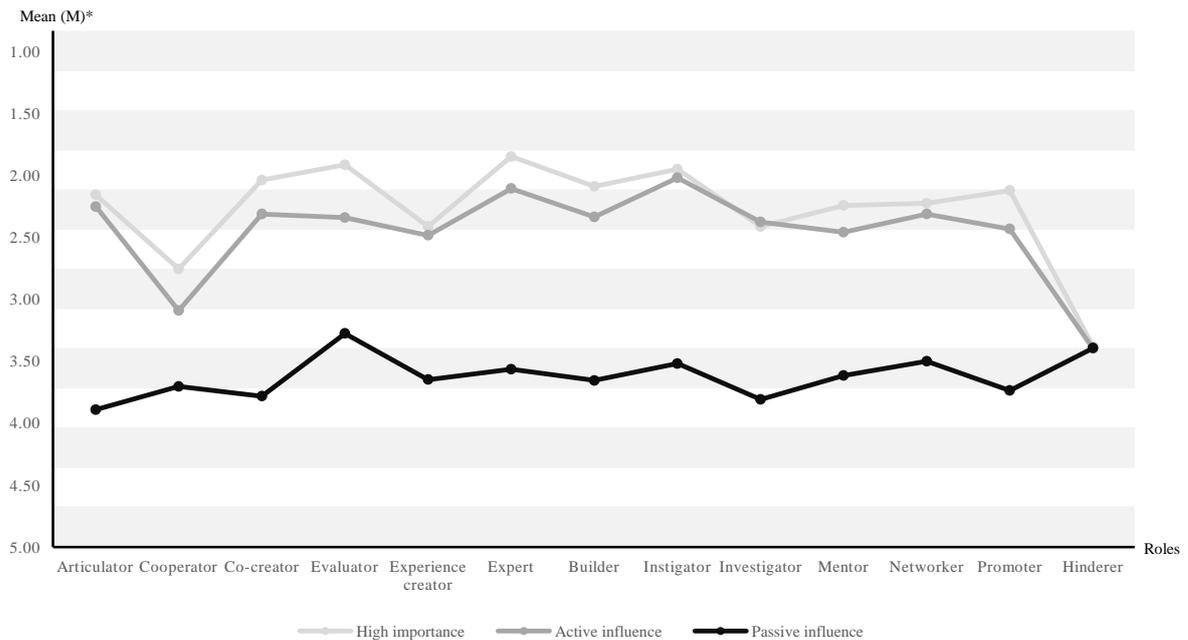
In the last step, the importance of each role and its active and passive influence in BM design are discussed. A consistent picture of the influence and importance emerges across all roles. While the passive influence tends to be opposed across all roles, it is apparent that almost all roles are rather important to moderately important. The role of the hinderer, which is attributed neither an active nor a passive influence, must be excluded from this conclusion. Furthermore, the hinderer is also rated as rather unimportant overall.

None of the 13 roles stands out markedly from the rest. The role with the highest importance is that of the expert ($M = 1.84$; $SD = 1.073$), followed by the roles of the evaluator ($M = 1.91$; $SD = 1.138$) and the instigator ($M = 1.95$; $SD = 1.220$). The least important role, except for that of the hinderer, is the role of the cooperator ($M = 2.75$; $SD = 1.405$).

A similar picture emerges for the active influence of the roles. The instigator ($M = 2.02$; $SD = 1.094$) and the expert ($M = 2.10$; $SD = 1.224$) are classified as the roles with the most active influence, and the role of the cooperator ($M = 3.09$; $SD = 1.392$) as the one with the least active influence apart from the role of the hinderer.

Despite the low mean values for the agreement on the passive influence of the roles, the roles of the evaluator ($M = 3.27$; $SD = 1.297$) and the hinderer ($M = 3.39$; $SD = 1.557$) still show a moderate passive influence, with the mean values of the highest agreement.

Figure 14 shows the mean values of the actor roles that are present in the five process stages. A detailed overview of the descriptive statistics, including all mean values, standard deviations, minimum values, and maximum values, is given in appendix 9.



*with 1 = strongly agree to 5 = strongly disagree

Figure 14: Mean values of importance and influence among the actor roles

6.2.2.4.3 Regression Analysis

All possible combinations of the respective role-specific actors and the development steps of a BM, as well as the assessments of the high importance and the extent of participation in this process, were examined and analysed. Unfortunately, violations of the prerequisites of linear regression analysis were found in all applied analyses. Either no homoscedasticity was observed, the prerequisite for linearity in the parameters was violated, or both applied. In this context, it should be noted that heteroscedasticity is often a problem of non-linearity. Hence, testing for heteroscedasticity can also be understood as testing for non-linearity (Backhaus et al., 2006). As a result, no statistical conclusions can be drawn concerning the relations between

the variables, nor were the researchers able to gather information about the influence of different actors on the process steps, the extent of importance, or the extent of participation.

6.2.2.4.4 Analysis of Variance

As described in the methodology, the existence of relations between a metrically scaled dependent variable and a nominally scaled independent variable (factor) with several factor levels is examined in ANOVA. In this study, the size of the founding team and the spatial dimension of the start-up's activities were considered to have expressive power as factor variables. Because of the diverse set of industries, they could not be considered for ANOVA. The significant results of the study are discussed in the following.

First, an ANOVA was calculated with SPSS 27.0 to investigate whether there are differences among the roles according to the actor groups, the role presence in the five process stages of BMI, and the assessment of importance and influence (i.e., active and passive influence) depending on the size of the founding team. The ANOVA revealed significant mean differences associated with these dependant variables across the sizes of the founding team for all 13 roles. The Scheffé post-hoc test was conducted to check for pairwise mean comparisons, i.e., which means differ significantly from each other. The Scheffé test is suitable when pairs of means are to be compared and variance homogeneity is given, but the sample size is rather unequal. Because variance homogeneity according to Levene's test ($p > .05$) was not given for all results, the Games-Howell post-hoc test, which tests in case of variance inhomogeneity, was also conducted. These two post-hoc tests illustrated multiple differences between the two groups of 1 founder and 2–3 founders. Because of the small sample size of only five respondents that assigned themselves to a founding team with 4–5 founders ($N = 5$), this group could not be taken into consideration. After excluding this group of 4–5 founders and calculating the post-hoc tests, 14 significant mean differences were obtained that showed differences of the actor groups, the role presence in the five process stages, or the assessment of importance and influence, depending on the size of the founding team. There was no significant difference in relation to the roles of the articulator, evaluator, experience creator, expert, and mentor.

Overall, the results show that for all significant mean differences, new ventures with a founding team of 2–3 founders always experienced a higher level of agreement, i.e., the roles are more likely to be taken on by a group of actors, the roles are more likely to emerge in a stage, and they are more likely to be agreed on as being highly important and of influence. For example,

with a larger size of the founding team (2–3 founders) the roles of the builder, the promoter, and the hinderer are rather taken by some actor groups, (e.g., federal agencies) than for start-ups with only one founder.

The mean differences of the results are summarised in table 28, while the main results of the ANOVA relating to the size of the founding team are summarised in table 29. Here, differences always relate to mean comparisons of 1 founder versus 2–3 founders.

Table 28: Mean differences by size of the founding team

Role	Dependent variable	Sample size (N) (M; SD)	
		1 Founder	2–3 Founders
Builder	Public institutions	17 (4.59; 0.712)	33 (3.39; 1.657)
	Non-Profit Organisation	17 (4.59; 0.870)	33 (3.82; 1.550)
Promoter	Public institutions	17 (4.29; 1.213)	35 (3.31; 1.711)
Hinderer	Non-Profit Organisation	16 (4.88; 0.342)	32 (3.97; 1.307)
Cooperator	Stage 1	17 (4.0; 1.225)	34 (2.88; 1.533)
	Stage 2	17 (4.06; 0.899)	34 (2.79; 1.513)
	Stage 3	17 (3.94; 1.249)	33 (2.7; 1.489)
Co-creator	Stage 5	17 (2.34; 1.519)	35 (2.09; 1.197)
Investigator	Stage 1	17 (3.29; 1.632)	34 (2.21; 1.321)
	Stage 3	17 (3.12; 1.453)	32 (1.97; 1.258)
Cooperator	Active influence	16 (3.81; 1.276)	34 (2.65; 1.276)
Investigator	Active influence	17 (3.06; 1.296)	33 (1.86; 1.293)
Promoter	High importance	17 (2.76; 1.200)	35 (1.8; 1.079)
Hinderer	Passive influence	16 (4.19; 1.109)	34 (3.15; 1.579)

Table 29: Variance of analysis: Significance test of differences by the sizes of the founding team

Role	Dependent variable	Sum of squares	df	Mean squares	F	Significance
Builder	Public institutions	21.010	2	10.505	5.212	0.009
	Non-Profit Organisation	11.955	2	5.978	3.204	0.049
Promoter	Public institutions	14.439	2	7.220	3.010	0.057
Hinderer	Non-Profit Organisation	9.764	2	4.882	3.726	0.031
Cooperator	Stage 1	15.111	2	7.555	3.697	0.031
	Stage 2	28.386	2	14.193	8.391	0.001
	Stage 3	17.809	2	8.905	4.685	0.013
Co-creator	Stage 5	11.000	2	5.500	3.398	0.041
Investigator	Stage 1	14.289	2	7.144	3.861	0.027
	Stage 3	16.794	2	8.397	5.034	0.010
Cooperator	Active influence	17.018	2	8.509	5.037	0.010
Investigator	Active influence	19.835	2	9.918	6.022	0.004
Promoter	High importance	10.663	2	5.332	4.220	0.020
Hinderer	Passive influence	15.322	2	7.661	3.440	0.039

In a second step, the same procedure was followed for the spatial dimension of the start-ups' activities. Hence, an ANOVA was calculated to investigate whether there are differences among the roles according to the actor groups, the role presence in the five process stages of BMI, and the assessment of importance and influence (i.e., active and passive influence) depending on the spatial dimension of the start-ups' activities. Overall, statistical significance was found in relation to 7 of the 13 roles. Variance homogeneity was checked for all results according to Levene's test ($p > .05$). Because variance homogeneity was not given for all results, the Games-Howell test was again conducted in addition to the Scheffé test to specify the mean differences. Furthermore, because of the small sample size of only six respondents that assigned themselves to the European dimension ($N = 6$), this group could not be included in the consideration and thus post-hoc tests illustrated the differences between the regional, national, and worldwide spatial dimensions.

The most significant mean differences relate to differences between the regional dimension and one of the other two groups, i.e., national or worldwide. Only two differences can be observed between the dimensions *national* and *worldwide*. In terms of actor groups, it appears that new ventures that operate regionally or globally are more likely to agree that some of the roles are taken on by one of the proposed actor groups. Furthermore, the role of the expert rather appears in stages 4 and 5 if the venture is operating on a global level. In addition, the experience creator and the hinderer have a more active influence if a venture is operating on a regional level than in a venture that is operating worldwide.

The mean differences of the results are summarised in table 30, while the main results of the ANOVA relating to the spatial dimension are summarised in table 31. Here, the differences always relate to mean comparisons of the regional, national, and worldwide dimensions.

Table 30: Mean differences by the spatial dimension

Role	Dependent variable	Sample size (N) (M; SD)			Mean differences between groups
		Regional (reg)	National (nat)	Worldwide (world)	
Experience creator	Non-Profit Organisation	20 (3.55; 1.638)	18 (4.72; 0.575)	10 (4.5; 0.850)	reg/nat
	Civil Society	20 (2.9; 1.651)	20 (4.25; 1.070)	10 (4.2; 1.135)	reg/nat
Expert	Founder/Founding team	20 (2.0; 1.076)	20 (2.3; 1.455)	11 (1.09; 0.302)	nat/world
Investigator	Private company/person	19 (3.37; 1.535)	20 (3.8; 1.281)	11 (3.64; 1.362)	reg/nat
Expert	Stage 4	20 (2.75; 1.446)	20 (2.4; 1.273)	11 (1.36; 0.674)	reg/world
	Stage 5	20 (2.35; 1.348)	19 (3.0; 1.491)	11 (1.36; 0.809)	nat/world
Mentor	Stage 3	20 (2.0; 1.257)	20 (3.10; 1.334)	11 (2.55; 1.368)	reg/nat
Experience creator	Active influence	20 (2.15; 1.089)	20 (2.4; 1.046)	10 (3.4; 1.350)	reg/world
Hinderer	Active influence	20 (3.0; 1.589)	20 (3.05; 1.395)	11 (4.36; 1.206)	reg/world

Table 31: Variance of analysis: Significance test of differences by spatial dimensions

Role	Dependent variable	Sum of squares	df	Mean squares	F	Significance
Experience creator	Non-Profit Organisation	14.252	3	4.751	3.069	0.036
	Civil Society	21.445	3	7.148	4.041	0.012
Expert	Founder/Founding team	15.965	3	5.322	3.885	0.014
Investigator	Private company/person	19.165	3	6.388	3.046	0.036
Expert	Stage 4	13.890	3	4.630	2.890	0.044
	Stage 5	18.762	3	6.254	3.512	0.021
Mentor	Stage 3	13.116	3	4.372	2.702	0.055
Experience creator	Active influence	10.899	3	3.633	2.735	0.053
Hinderer	Active influence	18.384	3	6.128	2.916	0.042

6.2.2.5 Discussion of the Results

Theoretical implications

Based on the results, it can be stated that all 13 roles were confirmed and are therefore present in the design process of a BM. The striking results of the descriptive analysis highlight the fact that the actor group founder/founding team is most clearly assigned to all roles. Two further actor groups are classified as rather agreed on to take some of the roles, which are the founders' personal environment and private business persons/firms. The founder/founding team can thus be regarded as being the dominant actor in BM design. This is in line with the findings of Zott and Amit (2015) and Snihur and Zott (2020), who emphasise that founders are the key actors in new ventures. However, it must also be noted that this survey was explicitly addressed to founders and was independently answered by them. This circumstance might have led to a rather positive and self-promoting role assignment on the part of the founders (Berekoven et al., 2009, p. 94), thereby leading to a distortion effect (Raithel, 2008, p. 80). To counteract this, future research should involve the perceptions of other actors such as foundation offices, research institutions, or cooperation partners of the start-ups and ask for these actors' assessments to generate a more complete representation of the study context.

Across all five stages, the roles with the greatest presence include those of the articulator, co-creator, evaluator, expert, and instigator. In contrast, the role of the hinderer is by far rated as the least present. A similar picture emerges for the importance and active influence of the roles, with the same roles reappearing. The role with the highest level of importance is that of the expert, followed by the roles of the evaluator and the instigator. The instigator and the expert are also classified as the roles with the most active influence. Overall, almost all roles are regarded as being rather important as opposed to unimportant although the role of the hinderer must be excluded from this conclusion. The results suggest that the hinderer is a very case-specific role that should not be generalised and may even be excluded from the role concept. Moreover, each of the roles that were assigned a high level of importance belongs to the task-oriented role category. This leads to the assumption that the task-oriented roles are perceived as more important in the pre-seed phase than the network-oriented roles. However, this assumption neglects the ratio of 10 task-oriented compared to three network-oriented roles, which acknowledges an underrepresentation of network-oriented roles.

Furthermore, most of the role dynamics and patterns as described in chapter 5.2.4.2 are confirmed, including the frequency with which the roles became visible, the type of influence the roles have on a new venture, and which roles are taken on by which actor groups. Two of the patterns reflecting these role dynamics—role multiplicity and temporality—could also be confirmed. Role multiplicity is confirmed by the fact that the results showed that every role was taken on at least once by every actor group (e.g., research and education institution, civil society). No actor group can be assigned to only one specific role, but rather each group takes on a variety of roles. This is in line with the findings of Story et al. (2011, p. 956), who reveal that importance resides not in which actor plays the role, but rather that the role is performed by any actor. Role temporality is also confirmed because actors dropped out of a new venture's BM design process while others entered the process. However, there are no clear findings regarding role ambidexterity and reciprocity. One possible reason for role multiplicity and temporality might be the heterogeneity of the industries in which the start-up companies are active. Due to this diversity, it is obvious that—depending on the industry—different actors can be found in the environment of the start-ups at different points in time.

Concerning the size of the founding team, it was shown that with a larger founding team (i.e., 2–3 founders) different actor roles are taken on by more different actor groups and are also more likely to be present in each process stage. This indicates that, with a larger founding team, more actor groups will be active in BM design than will be the case for a start-up that is founded with only one founder. One explanation for this could be that a team with more than one founder also facilitates connections with more contacts and acquaintances. Larger founding teams enjoy the privilege that tasks are taken on by different persons, which increases the probability that at least one of these persons will seek interactions with external actors. In the case of a single founder, all relationships only depend on this one person and their existing network contacts.

The roles of the cooperator and investigator are also more visible in the initial stages with founding teams of 2–3 individuals. These roles therefore only seem to be taken on when there are enough human resources to carry out research tasks. In the case of a single founder, it can be assumed that they do not have the time to deal with research in the early stages (i.e., role of the investigator) and that it is already too late to integrate research results later in stage 4, while in stage 5 no more research is needed. The same applies to the role of the cooperator. Since it takes a lot of time to look for and find cooperation partners in the early start-up phases, start-

ups with a larger founding team can profit from the availability of more human resources and, therefore, have more time to invest in looking for cooperation partners.

For the spatial dimension, it was found that start-ups operating at the national level tended to agree less regarding whether any roles were taken on by certain actor groups or were present at a certain stage. An explanation for this could be that start-ups that operate on a regional level have easier access to and are better informed about regional assistance programmes, events, and network structures because of the striking distance. Most foundation initiatives (e.g., foundation offices) act on a regional rather than on a national level, and hence start-ups have more contact points on the regional level. Start-ups that operate globally, on the other hand, depend on maintaining close contact with persons from different countries, as the founders themselves cannot always be present everywhere in the world. For start-ups that operate globally, the role of the expert especially comes into play in the later stages (i.e., stage 4 and stage 5). A reason for this could be that the founders of these start-ups lack legal or cultural knowledge to be able to act successfully in another country. Country-specific knowledge must therefore be provided by external actors, especially when the founders have already committed to a first BM and it is only a matter of fine-tuning and implementing the BM on the market.

Limitations

Regarding the results of the analysis of variance it must be noted that, due to the rather small sample size of the study, relatively few significant results were found overall. Hence, to improve the results, more participants must be encouraged to take part in the study in the future as this would enable the researchers to identify differences in relation to industries and the dimension of 4–5 founders in addition to the European dimension.

Another limitation of the study is that it is based on a survey of founders in German-speaking countries. A wide variety of entrepreneurs were included in the sample to be able to consider their diverse individual and firm characteristics. However, because of the rather small sample size, country-specific and cultural differences in terms of role-actor allocation, process stages, and role assessments could not be determined. For example, one participant mentioned that in some Latin American countries, no specific procedure is followed in the founding process, but that it is rather improvised. This might be a factor to be analysed in detail in future and this study's results provide a basis and framework for future research in other countries, to be able to compare these results to the results of this study.

A further limitation of this study lies in its use of an online survey as a method of data collection. The survey was also lengthy, consisting of 221 role-specific items and nine general and demographic items. In addition, the response rate was low (11.27 %). Typically, an average response rate for paper surveys is set at about 50 % (Cook et al., 2000, p. 826). However, to minimise the effects of participant fatigue, all questions in the survey were randomised (i.e., responses to items were not biased based on when they appeared during the process of completing the survey).

6.3 Concluding Discussion

By conducting two very different studies, one with a qualitative case study approach and the other based on a quantitative survey, the role concept developed in project II was examined in a temporal framework. The results of both studies not only confirm the presence of all 13 roles of the role concept but also provide a temporal framework that sheds light on the importance of each role in the different stages of the BM design process.

The studies' results match with existing imprinting research which holds that founders are the main imprinters when founding a new venture. In line with Bocken and Snihur (2020, p. 12), the studies extend this view by attributing great importance to the roles of the experience creator, expert, evaluator, instigator, articulator, and co-creator. With regard to the stages, it becomes clear that, although external actors are involved in the process during all stages and take on different roles, the three central stages, in particular, are characterised by more actor interactions in contrast to the initial stage and the final stage.

Furthermore, both studies hold similar limitations. While the sample size of the quantitative study is quite small, the case studies are limited to university spin-outs, both located in Germany. Accordingly, future research should extend to other contexts, sectors, and countries. Examining the BM design process of a much wider information source would be beneficial because new ventures are likely to permeate regional and national boundaries. Although the studies' findings may not be generalisable to a large population, they may hopefully generalise at a conceptual level.

7 Conclusion

In the following, the central findings of this paper are summarised. In a first step, the results of the three research projects are presented against the background of the research questions and implications for science and practice are subsequently derived from the findings. The chapter concludes with an outlook for future research and some limitations.

7.1 Summary of the Findings

The starting point of this paper was the observation that, in the pre-seed phase, new ventures face the complex task of designing a BM. Thereby, it appears that new ventures have to experiment with multiple BM design options because a set of feasible opportunities and viable BMs is often not predictable in advance (Alvarez & Barney, 2007). Founders accomplish this task within the framework of the BMI process.

Since BMI provides the context for this paper, the literature on BM and BMI is analysed first to provide a better understanding of the subject matter. The literature review highlights that many studies focus on the experiential learning benefits of experimentation as a method in BMI (Trimi & Berbegal-Mirabent, 2012). In contrary, little is known about the experiential learning benefits of cognition and thought experimentation in BMI (Felin & Zenger, 2009), in the sense of articulating a BM before testing it to minimise the paradox and risk of making the wrong choice for a BM. This concern is central to early-stage ventures, which are particularly vulnerable to uncertainty and financial constraints and have to work with premature ideas. Björkdahl and Holmén (2013, pp. 221–222) claimed that it is important to better understand whether there are patterns to how a firm can change its BM with the help of (thought) experimentation and which patterns are most likely to be successful. The literature review also revealed that the impetus for a BMI and its consequences can be very diverse and that most of the literature is at times conceptual while comparatively few empirical insights are available. These studies point to the role of external stakeholders (Ferreira et al., 2013), and suggest that influencing factors for BMI can also come from very different stakeholder groups which should further be analysed. They especially point to the significant influence of the founders themselves in BMI (Comberg et al., 2014).

In this context, it is observed that not only the founders themselves but also many other external actors play a central role during BM design, supporting the venture on its way to attaining a viable BM (de Hoyos-Ruperto et al., 2013, p. 58). These external actors engage by providing resources and knowledge, such as expert opinions and counselling, shared experiences, network connections, support and motivation, and money and facilities (Dimov, 2011; Hallen & Eisenhardt, 2012; Manning et al., 1989). In addition, the literature explains that these actors have different positions and tasks regarding each interaction in which they are engaged (Story et al., 2011) and certain behavioural patterns and types of resource contributions may be characteristic for a group of actors which leads to the emergence of distinct actor roles. Yet, it remains unclear how and to what extent BM design actually depends on actors other than the founders. Due to a considerable need of entrepreneurs to access resources without any return in the pre-seed phase, there is a need to specifically explore actors' voluntary resource contributions.

Given this central role of different actors in the context of BMI, an analysis of the current state of research on actor engagement is presented because engagement could possibly serve as a concept to specify and in more detail explain actor behaviours. While researchers are discordant if the term should be examined from a behavioural perspective or conceptualised as the disposition to engage, as well as the behaviour of engaging in an interactive process (Fehrer et al., 2018; Kleinaltenkamp et al., 2019), they agree that engagement behaviours refer to voluntary resource contributions (Storbacka, 2019). Furthermore, literature on engagement acknowledges that engagement occurs among different types of versatile actors (Brodie et al., 2019, p. 177). These studies focus on a variety of actors, including employees (Kumar & Pansari, 2016), citizens (Bowden et al., 2016), or even nonhuman actors, such as machines (Storbacka et al., 2016). However, the literature does neither specify these actor groups for the context of BM design in new ventures nor does the literature differentiate between mandatory and voluntary behaviours of these actors in this context.

Subsequently, role theory and multiple other approaches to understanding actor roles are reviewed. The literature review outlines a multitude of concepts for analysing the roles of key actors in innovation processes. While most research is focused on the role of customers or users in the context of innovations, only a few recent studies address general actor roles in innovation networks (Nyström et al., 2014), radical innovation (Story et al., 2011), innovation ecosystem birth (Dedehayir et al., 2018), or social innovation processes (Butzin & Terstriep, 2018). Böhm

et al. (2019) attempt the first step in this direction and show direct and indirect interactions of start-ups with various actors in the innovation system. In summary, the review of previous role typologies reveals quite a large variety of identified roles in different contexts and identification characteristics, although there seems to be no single role typology that can be generalised and could be applied to the context of BMI in new ventures. Furthermore, these roles may also differ in their appearance among different phases of the BMI process.

According to the literature review, four leading research questions emerged that were answered within the framework of three research projects:

1. *How does thought experimentation manifest in the pre-seed phase of BMI in a new venture?*
2. *How does BMI in a new venture depend on actor engagement behaviours and how do these behaviours support the appearance of thought experimentation in BMI?*
3. *Which roles do actors play in the pre-seed phase of BMI in a new venture, how can they be characterised, and who performs these roles?*
4. *In what stages of the pre-seed phase do the actors play which roles?*

To answer these research questions, this paper synthesises the two strands of literature on BMI and the engagement and roles of actors. The first research project focuses on the importance of thought experimentation and actor engagement in the context of BMI. The second research project looks at actor roles and their characteristics and dynamics, and the third research project places these roles in a temporal framework. The three research projects are thus based on the same perspective, i.e., the founder's perspective, although they address different questions.

Research project I is dedicated to thought experimentation and actor engagement in the context of BM design. The project follows the call by literature (Snhur et al., 2017) to integrate an entrepreneurial learning perspective with an actor engagement view. The starting point of the project is the assumed influence of external actors on founders' mental schemas (cognition and thought experimentation) through their behaviours and interactions, providing access to resources and helping in decision-making. Therefore, a qualitative-empirical study was conducted. The principal data collection method in this study was interviews with 19 founders of new ventures from Germany, who were still in or just past the pre-seed phase. Hence this study takes an entrepreneur's perspective. The implementation period of the 19 interviews ran over 2 years, from 2017 to 2019. The findings illustrate how a business idea is shaped into a

concrete BM. Thereby, the manifestation of thought experimentation as an experiential learning method in BMI was analysed. Thought experimentation appears through the interplay of three different forms (purposeful interactions, incidental interactions, and theorising). The findings also highlight that thought experimentation depends on how founders connect with their environment and, most importantly, with their surrounding actors. These external actors integrate different resources, including expert knowledge, facilities and equipment, relational capital, development skills, experience, and reflection skills.

Research project II focuses on the conceptualisation of actor roles in BM design. The project follows the notion that innovator roles are particularly important in the early stages of innovation projects and for highly innovative ventures (Gemünden et al., 2007), although this has neither been elaborated theoretically nor tested empirically. Hence, this study aimed to divulge the full cast of roles that actors can take on and their varying levels of importance, to enable entrepreneurs to exercise agency by choosing which actors to engage and when and how to do so. A qualitative-empirical study was conducted to address the research question. The data in this study built on the same set of interviews with 19 founders of new ventures from Germany as in the first project, thereby also taking on an entrepreneur's perspective. The results revealed a total of 13 actor roles: the articulator, co-creator, cooperater, evaluator, experience creator, expert, hinderer, instigator, investigator, mentor, promoter, builder, and networker. These roles can be categorised into task-oriented and network-oriented roles. The findings also highlight the fact that the roles partially correspond to previous research on customer and actor roles in an innovation context. Furthermore, the findings show a variety of role dynamics. These role dynamics include the frequency with which the roles became visible, the type of influence the roles have on a new venture, which roles were taken by which actor groups, and details on the four patterns including role multiplicity, ambidexterity, reciprocity, and temporality.

Research project III shifts the focus to the temporal classification of the actor roles—role temporality—that were identified in project II, which raised the need to analyse this role dynamic in more detail. The objective is to provide a visualisation of the actor roles along a timeline to enable actors to plot the sequence of their emergence and the sequence of activities they enact during a foundation process. To answer the last research question, project III was divided into two studies, both having the same research aim. The data of study I is built on two case studies with university spin-outs founded in the same city in Germany. Therefore, data was collected over a period of 3 years for each venture between 2017–2021. In total, 10 official

interviews were conducted with the founding teams and representatives of the local structure (e.g., employees of the university's foundation office) who participated in activities at both ventures. In study II, a quantitative survey using an online questionnaire was conducted with founders as participants, who founded no earlier than in 2012. Data collection was carried out via various media (e.g., LinkedIn), which in the end, resulted in an effective sample of 58 participants. To analyse the data, in both studies the generic BMI process model by Wirtz and Thomas (2014) and Wirtz and Daiser (2018) was applied. Thereby, the BM design process is conceptualised as the span of time that stretches from an initial analysis stage to the decision-making stage for one BM. That is, in study I, all key events and activities that were analysed in the two case studies are plotted along the generic BMI process model. In study II, the respondents were directly asked to arrange actors' appearance and activities along the BMI process stages. The results of both studies not only confirm the presence of all 13 roles of the role concept identified in project II—divided into task-oriented and network-oriented roles—but also provide a temporal framework that sheds light on the importance of each role in the different stages of the BM design process. The results of both studies match with existing imprinting research which holds that founders are the main imprinters when a new venture is founded. Furthermore, both studies confirm the great importance of the task-oriented role category, which leads to the assumption that the task-oriented roles are perceived as more important than the network-oriented roles in the pre-seed phase. With regard to the five stages of the generic BMI process model, it becomes clear that external actors are involved in the process during all five stages. However, the three central stages,—that are the feasibility analysis, prototyping, and decision-making—in particular, are characterised by more frequent interactions between the founders and external actors in comparison to the initial and final stages. The results of study II also show that for start-ups with a larger founding team, more actor groups are involved in BM design than is the case for start-ups that have only one founder.

7.2 Implications for Research and Practice

The present paper provides valuable implications for both science and business practice. The implications are derived from the conceptual part of the paper and the empirical investigations of the three research projects. They are discussed in more detail below.

Theoretical Implications

The first project contributes to entrepreneurship literature by highlighting that, in accordance with Felin and Zenger (2009), a new perspective must be imposed on experimentation, by conceptualising it as a state of cognition. The study's findings emphasise that experimentation must not only be acknowledged as a superordinate construct; it has to be recognised from a more profound level of analysis in which different characteristic forms are revealed in terms of interactions and theorising. Moreover, this study focused on thought experimentation as a single method of BM design. It is therefore necessary to investigate further contrasting mechanisms (Berends et al., 2016) and observe what other methods arise in the pre-seed phase and the extent to which they are determined by actor engagement.

The results of the first project also contribute to marketing literature by conceptualising actor engagement as the actors' behaviours that influence if and how thought experimentation appears in the process of BM design. Thereby, the discussion on actor engagement is transferred to an under-explored research field and new environment in which it unfolds different and newly informed behaviours. This article marks a first attempt to conceptualise and empirically document the connection between BMI and actor engagement in the pre-seed phase of BM design.

The second project contributes to the discussion on role theory by highlighting actor roles and characterising role patterns in the pre-seed phase of BM design in new ventures. Even though the identified roles are partly comparable to roles found in previous research in innovation contexts, they are not identical to the characterisations of the roles in the context of BM design. Thus, this study contributes to innovation literature, structuring actor behaviours into roles and providing an overview of actors and actor groups in innovation, precisely in the specific context of BM design. Furthermore, the variety of role dynamics that were identified contribute to the discussion of role sets (Biddle, 1979) and help to explain how new ventures, which are characterised by uncertainty and financial constraints, design a BM. These role dynamics show

that role behaviour in BM design is more unpredictable and dynamic than it might be in established firms, including the need for a more diverse set of actor groups to be successful.

The second project also contributes to entrepreneurship literature by showing how actors who are involved in a new venture's ecosystem engage in more than one role than that which they might officially be assigned to. For example, formal agencies are not only involved in administrative activities, but they also act as promoters, builders, and evaluators, providing resources such as infrastructure, funding, increased support for networking, and approval of BM choices. This reflects the versatility of theoretical approaches to role theory, in that roles are either taken by an actor to hold the expectations that map the expectations of others or are made or played by an actor that changes a role through their individuality and actions.

The third project contributes to entrepreneurship and innovation literature by highlighting that entrepreneurs must learn and profit from interactions with external actors throughout all stages of the BM design process (Minniti & Bygrave, 2001; Snihur et al., 2017) as there is no single stage in which no external actors (roles) appear. Furthermore, study I outlines the multidirectional character of the BM design process by showing that instead of being a sequential, linear procedure, the BM design process is rather a semi-structured flow of activities and events that can always lead to adjustments of an initial BM due to unforeseen events (e.g., COVID-19 pandemic impacts, loss of potential partnerships). This finding supports the assessment of the generic process by Wirtz and Daiser (2018), who assume that the BMI process is characterised as being semi-structured and including loops. Among that, Study II outlines that

Managerial Implications

From a managerial perspective, this paper has implications that differ for practitioners, including entrepreneurs and actors such as investors and policymakers who are acting externally concerning a new venture but are involved in foundation processes.

From a managerial perspective, entrepreneurs must be aware that they consistently go through a process of thought experimentation and that this process can be promoted by interacting with actors that are external to their venture. This might help them to actively take chances, understand how to further develop a BM when they are stuck, and exploit knowledge, technology, or ideas from external actors (Lindholm-Dahlstrand et al. 2019). When BM design

is acknowledged as a process that includes such thought experimentation, new ventures can use it as a way to eliminate uncertainties and questions. As soon as a new venture enters the market, questions from the environment about the composition of the BM can be better legitimised. To get a better feeling for exactly what resources and behavioural support are needed in which stages in the pre-seed phase, entrepreneurs can also promote engagement according to the five stages of the generic BMI process (Wirtz & Daiser, 2018; Wirtz & Thomas, 2014). The results do not show an iterative process or a cycle in which engagement appears. In all stages of the pre-seed phase, all engagement behaviours are of importance, except that of supporting behaviour, which is not relevant in the first stage of observation. Sharing behaviour is particularly prominent in the initial stage, whereas supporting behaviour is prominent in the final implementation stage, which suggests that the focus should be on obtaining expert knowledge at the beginning to create a valid BM, and towards the end, the search should focus on obtaining assistance in terms of acquiring office space or financial support. The data also describes which actor types are important to get access to which resources. Entrepreneurs must first analyse which stage they find themselves in, then find out what resources and behaviours are needed in that stage, and accordingly target the actor group that, according to the data, most prominently make these resources available.

Furthermore, this paper may have implications for public policy, investors, and private companies. It is well known that uncertainty may limit the survival of new ventures. In the longer run, this may lead to fewer entrepreneurs being able to establish a new venture. Thus, policymakers and private companies should implement entrepreneurial trainings that helps entrepreneurs develop experimentation skills, e.g., self-reflection skills, and provide support for learning how and with whom to build relationships. More foundation offices and development sites should be opened and promoted via social media, at universities, and at purpose-made start-up events. Foundation offices should work to establish cooperations with investors, large companies, and innovative platforms from which new ventures could learn and benefit. At present, the existing structures only offer programs that are limited and mostly dependent on local network structures and actors and do not operate on a national dimension. So far, they also do not provide specific information that is relevant for a specific industry or market. Entrepreneurs go through time-consuming processes and attend general workshops on entrepreneurship that are not adequate for addressing their needs; rather, targeted training measures should emphasise individual actors and their BMs.

7.3 Limitations and Future Research

The research choices in this study created some limitations that lead to future research opportunities. Significantly, all studies focused on entrepreneurs located in Germany and the context of the second study in project III was even more narrow, as only university spin-outs were considered for the analysis. Thus, more research is to be done with larger sample sizes and in different industries and countries. The studies' samples were not larger due to two reasons. First, the total pool of start-ups in German-speaking countries is limited because not all start-ups are widely covered in the press. Second, many contacted start-ups hesitated to participate in the study, because they did not want to share any data for fear of being copied by competitors. Researchers must take note of the fact that new ventures that are not yet established on the market are often not prepared to disclose sensitive data to the public. Third, for the qualitative interviews in project I and II, the founders admitted that there is an increasing research interest in the development of start-ups and that, due to time constraints, they are unable to respond to all researchers' requests for input.

Furthermore, the research setting of all studies relied on in-depth interviews with key informants that almost exclusively were entrepreneurs—with the exception of study I of the third project. Future studies should seek to collect data from other stakeholders as well, e.g., partners, customers, investors, as the perceptions of the entrepreneurs might not necessarily be equivalent to those of external actors.

Additionally, the researchers did not collect information about the final BMs of the start-ups, i.e., the development of the ventures beyond the pre-seed phase. Thus, it is unclear, if and under which circumstances thought experimentation and engagement behaviours have a positive and negative effect on the performance and competitiveness of a venture. Accordingly, it is also not known which roles are necessary to be successful in the phases that occur later than the pre-seed phase. Therefore, studies analysing actor roles in other types of BMI processes, e.g., at a later phase, are needed to compare results.

In addition, it would be interesting to take a closer look at exactly which BM components are changed by which actor roles and thus future research should more closely examine the individual BM components. Future research should also examine each actor role in more detail and determine ways in which new ventures can incorporate these roles within their strategies to forge long term relationships with the diverse actor groups. The framework of the actor roles

can also be utilised for developing research hypotheses that could be further tested. An empirical analysis of each of the actor roles, various motivational drivers, barriers, pre-conditions, and outcomes of the BM design process in new ventures are also worthy of study.

Another option for future research might be to link the results of project I with the results of project II and project III, i.e., to examine which roles influence thought experimentation and which roles promote engagement behaviour. This would make it possible to promote engagement behaviour in a more targeted way. Conducting a quantitative study in this context could help to determine whether there are differences in the forms of thought experimentation and the engagement behaviours in relation to the size of the founding team and the spatial dimension, i.e., whether thought experimentation is more important at certain stages in larger founding teams than in smaller teams.

Furthermore, greater network structures, such as entrepreneurial ecosystems, should be recognised. Hence, not only should individual interactions between actors be considered, but they should also be viewed from a broader network or ecosystem perspective (Brodie et al., 2019) to understand the overall process of BM design. There is a need for a managerial focus, not just on dyadic relationships (e.g., between an entrepreneur and an expert), but also on the broader collection of diverse actors embedded within an entrepreneurial ecosystem. This will enable more complete considerations of the multiple, interdependent linkages and influences that exist within an entrepreneurial ecosystem.

Appendix

Appendix 1: Prevalence of roles among the stages in individual loops at Alpha	238
Appendix 2: Prevalence of roles among the stages in individual loops at Beta.....	240
Appendix 3: Questionnaire (translated from German)	242
Appendix 4: Cover letter for data collection	247
Appendix 5: Descriptive statistics of the age of participants	248
Appendix 6: Descriptive statistics of the industry frequency.....	249
Appendix 7: Descriptive statistics of actor groups among actor roles	250
Appendix 8: Descriptive statistics of actor roles along the stages	254
Appendix 9: Descriptive statistics of importance and influence among actor roles	256

Appendix 1: Prevalence of roles among the stages in individual loops at Alpha

	Loop 1				
	Analysis	Ideation/ Feasibility	Prototyping	Decision- making	Implemen- tation
Articulator	x	x	x		
Builder		x			
Co-creator				x	
Cooperator					
Evaluator					
Experience creator	x			x	
Expert		x			
Hinderer		x	x		
Instigator					
Investigator		x			
Mentor					
Networker		x			
Promoter					

	Loop 2				
	Analysis	Ideation/ Feasibility	Prototyping	Decision- making	Implemen- tation
Articulator			x		
Builder		x	x	x	
Co-creator			x		
Cooperator				x	
Evaluator		x	x	x	
Experience creator		x	x		
Expert		x	x	x	
Hinderer		x	x		
Instigator		x	x	x	
Investigator	x	x	x		
Mentor			x		
Networker		x	x	x	
Promoter		x	x	x	

	Loop 3				
	Analysis	Ideation/ Feasibility	Prototyping	Decision- making	Implemen- tation
Articulator		x			x
Builder				x	
Co-creator				x	
Cooperator					
Evaluator					
Experience creator					x
Expert				x	
Hinderer					
Instigator				x	
Investigator					x
Mentor					
Networker				x	
Promoter					

	Loop 4				
	Analysis	Ideation/ Feasibility	Prototyping	Decision- making	Implemen- tation
Articulator	x		x		
Builder		x			
Co-creator			x	x	
Cooperator			x	x	
Evaluator					
Experience creator	x	x	x	x	
Expert				x	
Hinderer					
Instigator	x		x		
Investigator		x			
Mentor					
Networker					
Promoter			x	x	

Appendix 2: Prevalence of roles among the stages in individual loops at Beta

	Loop 1				
	Analysis	Ideation/ Feasibility	Prototyping	Decision- making	Implemen- tation
Articulator	x	x	x		
Builder		x			
Co-creator				x	
Cooperator					
Evaluator					
Experience creator	x			x	
Expert		x			
Hinderer		x	x		
Instigator					
Investigator		x			
Mentor					
Networker		x			
Promoter					

	Loop 2				
	Analysis	Ideation/ Feasibility	Prototyping	Decision- making	Implemen- tation
Articulator		x	x		
Builder		x	x		
Co-creator		x	x	x	
Cooperator		x		x	
Evaluator		x	x	x	
Experience creator		x	x		
Expert		x	x	x	
Hinderer		x		x	
Instigator		x	x	x	
Investigator		x	x		
Mentor					
Networker		x	x		
Promoter		x			

	Loop 3				
	Analysis	Ideation/ Feasibility	Prototyping	Decision- making	Implemen- tation
Articulator	x	x	x		
Builder		x	x		
Co-creator					
Cooperator			x		
Evaluator			x		
Experience creator		x	x		
Expert			x		
Hinderer					
Instigator			x		
Investigator					
Mentor					
Networker		x	x		
Promoter			x	x	

	Loop 4				
	Analysis	Ideation/ Feasibility	Prototyping	Decision- making	Implemen- tation
Articulator					
Builder				x	
Co-creator					
Cooperator		x		x	x
Evaluator			x		
Experience creator			x		
Expert			x		
Hinderer					
Instigator			x	x	x
Investigator			x		
Mentor					
Networker					
Promoter		x	x	x	x

Appendix 3: Questionnaire (translated from German)

Thematic Introduction

Dear participant,

Thank you very much for participating in our survey.

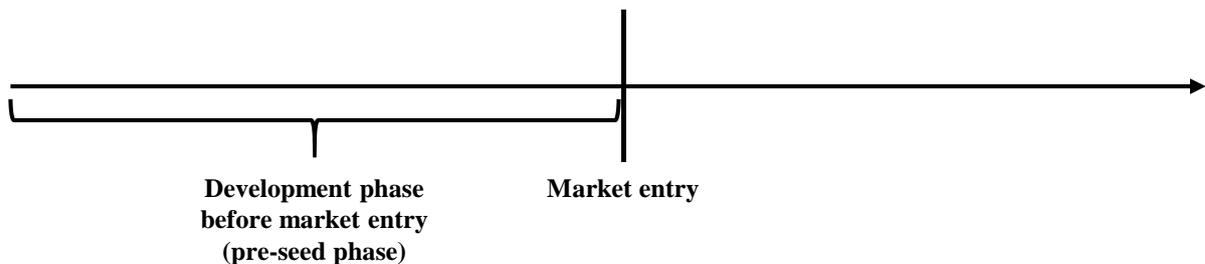
It will take about 5-10 minutes of your time to complete the survey.

The answers to the questions are completely anonymous and do not allow any conclusions to be drawn about your person. The data collected will be treated as strictly confidential and will be used exclusively for research purposes.

The aim of this study is to ask selected founders about their subjective assessment of the **central actors and their roles** in the design process of a new business model for a start-up company. To do this, it is necessary that you have already founded a company yourself or are currently actively in the process of founding a company. The type of company and the size of the company are not relevant at this point.

A **business model describes** the basic principle according to which an organisation creates, conveys, and captures value. A business model can be described in terms of nine basic building blocks that show the logic by which a company operates and makes money. These building blocks cover the following areas: Customer Segments, Value Proposition, Distribution Channels, Customer Relationships, Revenue Sources, Key Resources, Key Activities, Partnerships/Collaborations, and Cost Structure. **Developing a new business model** thus involves selecting and assembling these building blocks appropriately and optimally for a company.

In the following, the development of a new business model for start-up companies will **only be considered in relation to the early development phase** before market entry. The relevant phase is coloured red in the timeline shown below.



If your start-up has already entered the market, please think back into the **early development phase** before market entry.

General data (Section I)

Question 1: To which sector/industry does the start-up company belong that you have founded or are currently founding?

- Automobile and vehicle construction
- Construction industry
- Banking and finance
- Education industry
- Chemicals and pharmaceuticals
- Services
- Energy and environment
- Research and Development
- Liberal professions
- Health economy and social affairs
- Trade and consumption
- Crafts
- Real Estate and Housing
- Information Technology and Telecommunications
- Culture, Entertainment, and Events
- Mechanical and Plant Engineering
- Tourism and Recreation
- Transport, Transport, and Logistics
- Insurance
- Other: _____

Question 2: In which year was your start-up company founded?

Question 3: How many people are/were in your start-up team at the beginning of the foundation process?

- 1
- 2-3
- 4-5
- > 5

Question 4: In which spatial dimension are you active with your start-up company?

- regional
- national
- european
- world wide

Question 5: How many employees work in your start-up company?

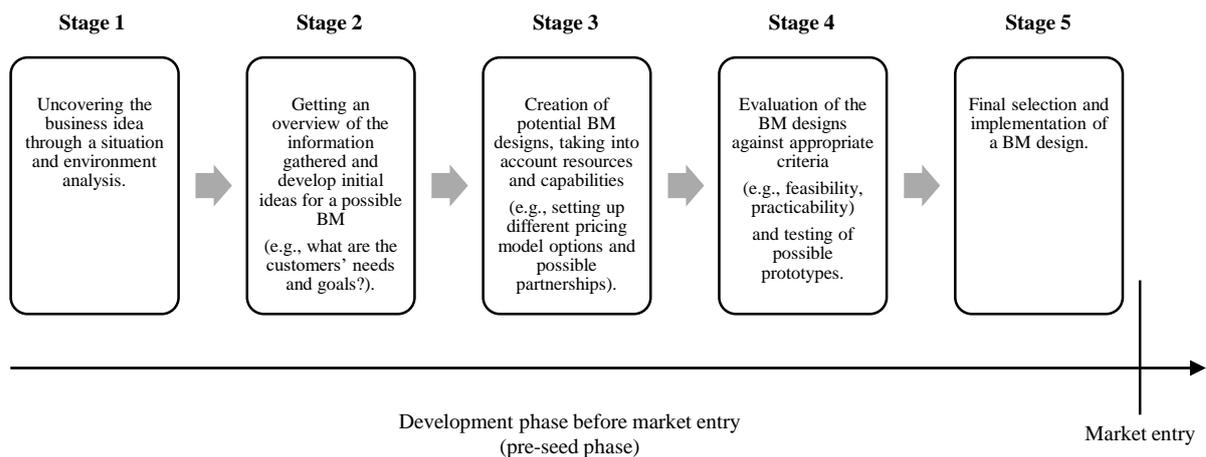
- 1-2
- 3-5
- 6-10
- 11-20
- >20

Role-specific data (Section II)

Please read the following role description carefully.

Each role can be taken by a single person (e.g. founder, advisor, colleague) as well as an entire institution (e.g. start-up office, start-up hub, funding banks).

Please select applicable statements regarding the roles described and note that only the period before the market entry of your start-up is to be considered here. This period can be broken down into five stages:

**Role description:**

Randomised query of the individual role descriptions according to table 26.

Questions 6-8 are asked for each role description given in table 26.

Question 9: Can you think of any other roles, that are/were relevant in the development of your business model?

(Please describe the role briefly, i.e., the importance of the role, when this role was relevant, by which actor this role was taken).

(Open question)

Demographic data (Section III)

Finally, we would like to ask you for some information about your person.

Question 10: Please state your age in the following text field.

Question 11: Please state your gender.

- Male
- Female
- Diverse
- Not specified

Question 12: What was the annual turnover of your start-up in the 2019 financial year?

- No turnover
- 1 to under 150,000 €
- 150,000 to under 500,000 €
- 500,000 to under 2 million €
- 2 million to under 10 million €
- 10 m € or more

You have now reached the end of the survey. Thank you very much for your participation!

End of the questionnaire

Appendix 4: Cover letter for data collection

Dear Mrs XY/Dear Mr XY,

thank you very much for taking part in my survey. The following link will transfer you to the survey.

Link: https://ww3.unipark.de/uc/KL_TUKaiserslautern_Roth_LS/038f/

In this study, I kindly ask you to make decisions about 13 different actor roles. I recommend you to carry out the study (approx. 20 minutes) in a quiet environment. In addition, I recommend you to do this study at a time when you feel rested and can concentrate well.

Please note that the study is not compatible to smartphones and tablets. Even though I cannot offer much as an incentive, I will donate 1€ as a thank you for each completed questionnaire in favour of UNICEF's "Refugee Children in Greece" project.

Your data will of course be treated confidentially at all times, will not be passed on to third parties, and will be evaluated anonymously!

If you have any further questions or would like to give feedback on the study in any way, please do not hesitate to contact me. The best way to reach me is via e-mail (sophie.mentges@wiwi.uni-kl.de).

Kind regards

Sophie Mentges

Appendix 5: Descriptive statistics of the age of participants

	Age	Frequency	Percent	Valid percent	Cummulative percent
Valid	17	1	1.7	1.7	1.7
	19	1	1.7	1.7	3.4
	20	5	8.6	8.6	12.1
	21	3	5.2	5.2	17.2
	22	1	1.7	1.7	19.0
	23	2	3.4	3.4	22.4
	24	1	1.7	1.7	24.1
	25	2	3.4	3.4	27.6
	26	1	1.7	1.7	29.3
	27	5	8.6	8.6	37.9
	28	4	6.9	6.9	44.8
	29	1	1.7	1.7	46.6
	31	2	3.4	3.4	50.0
	32	3	5.2	5.2	55.2
	33	2	3.4	3.4	58.6
	34	2	3.4	3.4	62.1
	35	2	3.4	3.4	65.5
	38	4	6.9	6.9	72.4
	39	4	6.9	6.9	79.3
	40	1	1.7	1.7	81.0
	42	1	1.7	1.7	82.8
	43	1	1.7	1.7	84.5
	45	2	3.4	3.4	87.9
	47	1	1.7	1.7	89.7
	49	1	1.7	1.7	91.4
	50	1	1.7	1.7	93.1
51	1	1.7	1.7	94.8	
53	1	1.7	1.7	96.6	
54	1	1.7	1.7	98.3	
55	1	1.7	1.7	100.0	
Total		58	100.0	100.0	100.0

	N	Minimum	Maximum	Mean value	Standard deviation
Age	58	17	55	32.5	10.010
Valid values	58				

Appendix 6: Descriptive statistics of the industry frequency

	Industry	Frequency	Percent	Valid percent	Cummulative percent
Valid	Automobile and vehicle construction	2	3.4	3.4	3.4
	Banking and finance	1	1.7	1.7	5.2
	Construction industry	3	5.2	5.2	10.3
	Education industry	2	3.4	3.4	13.8
	Chemicals and pharmaceuticals	2	3.4	3.4	17.2
	Services	7	12.1	12.1	29.3
	Energy and Environment	3	5.2	5.2	34.5
	Liberal professions	2	3.4	3.4	37.9
	Trade and consumption	6	10.3	10.3	48.3
	Handicrafts	3	5.2	5.2	53.4
	Information Technology and Telecommunications	12	20.7	20.7	74.1
	Culture, Entertainment and Events	4	6.9	6.9	81.0
	Tourism and Recreation	3	5.2	5.2	86.2
	Insurance	1	1.7	1.7	87.9
	Others	7	12.1	12.1	100.0
Total		58	100.0	100.0	100.0

Appendix 7: Descriptive statistics of actor groups among actor roles

	Variable	N	Mean	SD	Minimum	Maximum
Articulator	Founder/founding team	58	1.84	1.040	1	5
	Personal environment	58	3.16	1.461	1	5
	Business person/firm	57	3.63	1.371	1	5
	Governmental institutions	56	3.96	1.307	1	5
	Research institutions	55	4.13	1.218	1	5
	Non-profit organisations	50	4.32	1.151	1	5
	Civil society	55	4.20	1.095	1	5
	No one	51	4.55	1.137	1	5
	Other actors	51	2.14	2.458	0	5
Builder	Founder/founding team	58	1.67	1.145	1	5
	Personal environment	58	3.09	1.466	1	5
	Business person/firm	58	2.95	1.538	0	5
	Governmental institutions	56	3.70	1.525	1	5
	Research institutions	56	3.93	1.438	0	5
	Non-profit organisations	55	3.98	1.421	0	5
	Civil society	57	3.98	1.395	0	5
	No one	52	4.37	1.372	0	5
	Other actors	51	2.00	2.400	0	5
Co-creator	Founder/founding team	57	1.49	0.909	1	5
	Personal environment	57	2.96	1.375	1	5
	Business person/firm	56	3.25	1.430	1	5
	Governmental institutions	57	4.00	1.282	1	5
	Research institutions	57	4.07	1.223	1	5
	Non-profit organisations	56	4.29	1.155	1	5
	Civil society	56	4.09	1.283	1	5
	No one	49	4.57	1.041	1	5
	Other actors	52	2.21	2.452	0	5
Cooperator	Founder/founding team	57	2.25	1.491	1	5
	Personal environment	58	3.67	1.381	1	5
	Business person/firm	58	3.29	1.622	1	5
	Governmental institutions	55	3.95	1.407	1	5
	Research institutions	55	3.98	1.381	1	5
	Non-profit organisations	53	4.11	1.368	1	5
	Civil society	56	4.36	1.069	1	5
	No one	52	4.60	0.934	1	5
	Other actors	51	2.33	2.447	0	5

Appendix 7: Descriptive statistics of actor groups among actor roles (continued)

	Variable	N	Mean	SD	Minimum	Maximum
Evaluator	Founder/founding team	58	1.95	1.248	1	5
	Personal environment	57	3.21	1.346	1	5
	Business person/firm	58	3.05	1.515	1	5
	Governmental institutions	56	3.57	1.512	1	5
	Research institutions	55	3.85	1.496	1	5
	Non-profit organisations	54	4.20	1.155	1	5
	Civil society	56	4.13	1.266	1	5
	No one	51	4.47	1.155	1	5
	Other actors	52	1.98	2.347	0	5
Experience creator	Founder/founding team	57	1.93	1.208	1	5
	Personal environment	57	2.58	1.149	1	5
	Business person/firm	56	3.09	1.379	1	5
	Governmental institutions	56	3.86	1.212	1	5
	Research institutions	53	4.11	1.121	2	5
	Non-profit organisations	53	4.19	1.316	1	5
	Civil society	56	3.71	1.436	1	5
	No one	51	4.55	0.966	1	5
	Other actors	49	1.55	2.319	0	5
Expert	Founder/founding team	58	2.03	1.256	1	5
	Personal environment	58	2.84	1.387	1	5
	Business person/firm	57	3.04	1.488	1	5
	Governmental institutions	56	3.86	1.271	1	5
	Research institutions	54	3.72	1.446	1	5
	Non-profit organisations	54	4.28	1.172	1	5
	Civil society	58	4.21	1.072	1	5
	No one	52	4.42	1.091	2	5
	Other actors	50	2.02	2.360	0	5
Hinderer	Founder/founding team	57	3.89	1.508	1	5
	Personal environment	58	3.64	1.398	1	5
	Business person/firm	56	3.86	1.299	1	5
	Governmental institutions	55	3.55	1.501	1	5
	Research institutions	55	4.13	1.218	1	5
	Non-profit organisations	53	4.23	1.203	1	5
	Civil society	55	4.05	1.224	1	5
	No one	51	4.08	1.354	1	5
	Other actors	49	1.84	2.330	0	5

Appendix 7: Descriptive statistics of actor groups among actor roles (continued)

	Variable	N	Mean	SD	Minimum	Maximum
Instigator	Founder/founding team	58	1.50	0.996	1	5
	Personal environment	57	3.49	1.351	1	5
	Business person/firm	57	3.63	1.331	1	5
	Governmental institutions	58	4.24	1.097	1	5
	Research institutions	57	4.26	1.158	1	5
	Non-profit organisations	54	4.48	1.023	1	5
	Civil society	56	4.04	1.388	1	5
	Other actors	51	4.57	1.044	1	5
	Others	50	2.12	2.455	0	5
Investigator	Founder/founding team	58	1.67	1.114	1	5
	Personal environment	57	3.19	1.481	1	5
	Business person/firm	58	3.47	1.524	1	5
	Governmental institutions	57	4.14	1.260	1	5
	Research institutions	57	4.16	1.177	1	5
	Non-profit organisations	54	4.30	1.192	1	5
	Civil society	53	4.38	1.023	1	5
	No one	51	4.67	0.816	2	5
	Other actors	52	2.10	2.370	0	5
Mentor	Founder/founding team	57	2.37	1.577	1	5
	Personal environment	57	3.00	1.500	1	5
	Business person/firm	58	3.09	1.367	1	5
	Governmental institutions	58	4.07	1.255	1	5
	Research institutions	56	4.11	1.317	1	5
	Non-profit organisations	55	4.33	0.944	2	5
	Civil society	57	4.00	1.180	1	5
	No one	51	4.45	1.189	1	5
	Other actors	51	1.96	2.341	0	5
Networker	Founder/founding team	57	1.88	1.297	1	5
	Personal environment	58	2.55	1.465	1	5
	Business person/firm	58	2.84	1.554	1	5
	Governmental institutions	57	4.07	1.348	1	5
	Research institutions	55	4.04	1.374	1	5
	Non-profit organisations	52	4.04	1.468	1	5
	Civil society	58	3.88	1.403	1	5
	No one	52	4.50	1.129	1	5
	Other actors	51	2.16	2.420	0	5

Appendix7: Descriptive statistics of actor groups among actor roles (continued)

	Variable	N	Mean	SD	Minimum	Maximum
Promoter	Founder/founding team	57	1.89	1.205	1	5
	Personal environment	57	3.04	1.511	1	5
	Business person/firm	57	3.23	1.626	1	5
	Governmental institutions	58	3.55	1.602	1	5
	Research institutions	56	3.70	1.640	1	5
	Non-profit organisations	54	4.30	1.283	1	5
	Civil society	56	4.14	1.407	1	5
	No one	51	4.59	1.004	1	5
	Other actors	53	2.11	2.399	0	5

Appendix 8: Descriptive statistics of actor roles along the stages

	Variable	N	Mean	SD	Minimum	Maximum
Articulator	Stage 1	58	2.31	1.392	1	5
	Stage 2	58	2.36	1.334	1	5
	Stage 3	56	2.27	1.368	1	5
	Stage 4	57	2.39	1.292	1	5
	Stage 5	56	2.39	1.303	1	5
Builder	Stage 1	57	2.84	1.373	1	5
	Stage 2	58	2.43	1.272	1	5
	Stage 3	58	2.48	1.430	1	5
	Stage 4	58	2.57	1.326	1	5
	Stage 5	57	2.56	1.296	1	5
Co-creator	Stage 1	58	2.66	1.421	1	5
	Stage 2	56	2.63	1.356	1	5
	Stage 3	58	2.28	1.348	1	5
	Stage 4	58	2.22	1.185	1	5
	Stage 5	58	2.29	1.325	1	5
Cooperator	Stage 1	57	3.21	1.497	1	5
	Stage 2	57	3.07	1.462	1	5
	Stage 3	56	3.09	1.468	1	5
	Stage 4	56	2.89	1.436	1	5
	Stage 5	54	2.78	1.488	1	5
Evaluator	Stage 1	58	2.57	1.602	1	5
	Stage 2	58	2.38	1.437	1	5
	Stage 3	58	2.24	1.275	1	5
	Stage 4	58	1.90	1.103	1	5
	Stage 5	58	2.33	1.444	1	5
Experience creator	Stage 1	57	2.74	1.541	1	5
	Stage 2	56	2.46	1.348	1	5
	Stage 3	57	2.49	1.255	1	5
	Stage 4	57	2.49	1.269	1	5
	Stage 5	57	2.67	1.443	1	5
Expert	Stage 1	58	2.43	1.557	1	5
	Stage 2	58	2.12	1.352	1	5
	Stage 3	58	2.21	1.281	1	5
	Stage 4	58	2.31	1.327	1	5
	Stage 5	56	2.39	1.423	1	5
Hinderer	Stage 1	56	3.63	1.472	1	5
	Stage 2	57	3.72	1.320	1	5
	Stage 3	57	3.61	1.485	1	5
	Stage 4	57	3.35	1.433	1	5
	Stage 5	57	3.54	1.402	1	5
Instigator	Stage 1	57	2.63	1.508	1	5
	Stage 2	57	2.35	1.343	1	5
	Stage 3	58	2.29	1.325	1	5
	Stage 4	58	2.29	1.338	1	5
	Stage 5	58	2.28	1.348	1	5

Appendix 8: Descriptive statistics of actor roles along the stages (continued)

	Variable	N	Mean	SD	Minimum	Maximum
Investigator	Stage 1	57	2.53	1.428	1	5
	Stage 2	57	2.04	1.253	1	5
	Stage 3	55	2.44	1.385	1	5
	Stage 4	55	2.44	1.302	1	5
	Stage 5	55	2.45	1.358	1	5
Mentor	Stage 1	58	2.78	1.568	1	5
	Stage 2	57	2.49	1.416	1	5
	Stage 3	58	2.50	1.328	1	5
	Stage 4	58	2.38	1.182	1	5
	Stage 5	58	2.57	1.403	1	5
Networker	Stage 1	58	2.81	1.583	1	5
	Stage 2	58	2.55	1.477	1	5
	Stage 3	58	2.69	1.379	1	5
	Stage 4	58	2.55	1.379	1	5
	Stage 5	58	2.71	1.439	1	5
Promoter	Stage 1	57	3.02	1.575	1	5
	Stage 2	58	3.12	1.499	1	5
	Stage 3	58	2.71	1.510	1	5
	Stage 4	57	2.77	1.536	1	5
	Stage 5	58	2.47	1.429	1	5

Appendix 9: Descriptive statistics of importance and influence among actor roles

	Variable	N	Mean	SD	Minimum	Maximum
Articulator	High importance	58	2.16	1.197	1	5
	Active influence	56	2.25	1.164	1	5
	Passive influence	55	3.89	1.149	1	5
Builder	High importance	58	2.09	1.189	1	5
	Active influence	57	2.33	1.258	1	5
	Passive influence	55	3.65	1.220	1	5
Cooperator	High importance	57	2.75	1.405	1	5
	Active influence	56	3.09	1.392	1	5
	Passive influence	54	3.70	1.268	1	5
Co-creator	High importance	56	2.04	1.235	1	5
	Active influence	58	2.31	1.143	1	5
	Passive influence	55	3.78	1.150	1	5
Evaluator	High importance	57	1.91	1.138	1	5
	Active influence	56	2.34	1.405	1	5
	Passive influence	51	3.27	1.297	1	5
Experience creator	High importance	56	2.41	1.332	1	5
	Active influence	56	2.48	1.206	1	5
	Passive influence	54	3.65	1.231	1	5
Expert	High importance	58	1.84	1.073	1	5
	Active influence	58	2.10	1.224	1	5
	Passive influence	55	3.56	1.273	1	5
Hinderer	High importance	58	3.38	1.461	1	5
	Active influence	58	3.40	1.521	1	5
	Passive influence	56	3.39	1.557	1	5
Instigator	High importance	58	1.95	1.220	1	5
	Active influence	57	2.02	1.094	1	5
	Passive influence	54	3.52	1.437	1	5
Investigator	High importance	56	2.41	1.385	1	5
	Active influence	56	2.38	1.396	1	5
	Passive influence	52	3.81	1.284	1	5
Mentor	High importance	58	2.24	1.159	1	5
	Active influence	57	2.46	1.283	1	5
	Passive influence	57	3.61	1.236	1	5
Networker	High importance	58	2.22	1.312	1	5
	Active influence	58	2.31	1.340	1	5
	Passive influence	56	3.50	1.465	1	5
Promoter	High importance	58	2.12	1.186	1	5
	Active influence	58	2.43	1.272	1	5
	Passive influence	57	3.74	1.316	1	5

References

- Aaboen, L. (2009). Explaining incubators using firm analogy. *Technovation*, 29(10), 657–670. <https://doi.org/10.1016/j.technovation.2009.04.007>
- Aarikka-Stenroos, L., & Jaakkola, E. (2012). Value co-creation in knowledge intensive business services: A dyadic perspective on the joint problem solving process. *Industrial Marketing Management*, 41(1), 15–26. <https://doi.org/10.1016/j.indmarman.2011.11.008>
- Aarikka-Stenroos, L., Sandberg, B., & Lehtimäki, T. (2014). Networks for the commercialization of innovations: A review of how divergent network actors contribute. *Industrial Marketing Management*, 43(3), 365–381. <https://doi.org/10.1016/j.indmarman.2013.12.005>
- Achtenhagen, L., Melin, L., & Naldi, L. (2013). Dynamics of business models – Strategizing, critical capabilities and activities for sustained value creation. *Long Range Planning*, 46(6), 427–442. <https://doi.org/10.1016/j.lrp.2013.04.002>
- Ackoff, R. L. (1981). *Creating the corporate future: Plan or be planned for*. University of Texas Press.
- Adams, J. S. (1965). Inequity in social exchange. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (2nd ed., pp. 267–297). Academic Press. [https://doi.org/10.1016/S0065-2601\(08\)60108-2](https://doi.org/10.1016/S0065-2601(08)60108-2)
- Afuah, A. (2004). *Business models: A strategic management approach*. McGraw-Hill Irwin.
- Afuah, A., & Tucci, C. L. (2001). *Internet business models and strategies: Text and cases*. McGraw-Hill Higher Education.
- Agogué, M., Yström, A., & Le Masson, P. (2013). Rethinking the role of intermediaries as an architect of collective exploration and creation of knowledge in open innovation. *International Journal of Innovation Management*, 17(2), 1350007. <https://doi.org/10.1142/S1363919613500072>
- Agrawal, A. K., & Rahman, Z. (2015). Roles and resource contributions of customers in value co-creation. *International Strategic Management Review*, 3(1/2), 144–160. <https://doi.org/10.1016/j.ism.2015.03.001>
- Ahearne, M., Bhattacharya, C. B., & Gruen, T. (2005). Antecedents and consequences of customer-company identification: Expanding the role of relationship marketing. *The Journal of Applied Psychology*, 90(3), 574–585. <https://doi.org/10.1037/0021-9010.90.3.574>
- Alam, I., & Perry, C. (2002). A customer-oriented new service development process. *Journal of Services Marketing*, 16(6), 515–534. <https://doi.org/10.1108/08876040210443391>
- Alcalde, H., & Guerrero, M. (2016). Open business models in entrepreneurial stages: Evidence from young Spanish firms during expansionary and recessionary periods. *International Entrepreneurship and Management Journal*, 12(2), 393–413. <https://doi.org/10.1007/s11365-014-0348-x>

- Alexander, M. J., & Jaakkola, E. (2016). Customer engagement behaviours and value co-creation. In R. J. Brodie, L. D. Hollebeek, & J. Conduit (Eds.), *Customer engagement: Contemporary issues and challenges* (pp. 21–38). Routledge, Taylor & Francis Group.
- Alexander, M. J., Jaakkola, E., & Hollebeek, L. D. (2018). Zooming out: Actor engagement beyond the dyadic. *Journal of Service Management*, 29(3), 333–351. <https://doi.org/10.1108/JOSM-08-2016-0237>
- Allen, T. J. (1970). Communication networks in R & D laboratories. *R&D Management*, 1(1), 14–21. <https://doi.org/10.1111/j.1467-9310.1970.tb01193.x>
- Allen, V. L., & van de Vliert, E. (1984). A role theoretical perspective on transitional processes. In V. L. Allen, & E. van de Vliert (Eds.), *Role transitions: Explorations and explanations* (pp. 3–18). Springer-Verlag. https://doi.org/10.1007/978-1-4613-2697-7_1
- Alvarez, S. A., & Barney, J. B. (2007). Discovery and creation: Alternative theories of entrepreneurial action. *Strategic Entrepreneurship Journal*, 1(1/2), 11–26. <https://doi.org/10.1002/sej.4>
- Amit, R. H., & Zott, C. (2001). Value creation in e-business. *Strategic Management Journal*, 22(6/7), 493–520. <https://doi.org/10.1002/smj.187>
- Amit, R. H., & Zott, C. (2010). *Business model innovation: Creating value in times of change* (Working Paper No. 870). IESE Business School. <https://doi.org/10.2139/ssrn.1701660>
- Amit, R. H., & Zott, C. (2012). Creating value through business model innovation. *MIT Sloan Management Review*, 53(3), 41–49.
- Amit, R. H., & Zott, C. (2015). Crafting business architecture: The antecedents of business model design. *Strategic Entrepreneurship Journal*, 9(4), 331–350. <https://doi.org/10.1002/sej.1200>
- Anderson, A. R., & Hardwick, J. (2017). Collaborating for innovation: The socialised management of knowledge. *International Entrepreneurship and Management Journal*, 13(4), 1181–1197. <https://doi.org/10.1007/s11365-017-0447-6>
- Andrews, B. (1975). Social rules and the state as a social actor. *World Politics*, 27(4), 521–540. <https://doi.org/10.2307/2010013>
- Andries, P., & Debackere, K. (2007). Adaptation and performance in new businesses: Understanding the moderating effects of independence and industry. *Small Business Economics*, 29(1/2), 81–99. <https://doi.org/10.1007/s11187-005-5640-2>
- Andries, P., Debackere, K., & van Looy, B. (2013). Simultaneous experimentation as a learning strategy: Business model development under uncertainty. *Strategic Entrepreneurship Journal*, 7(4), 288–310. <https://doi.org/10.1002/sej.1170>
- Antonacopoulou, E. P., & Konstantinou, E. (2008). The new service model: A review, a critique and a way forward. *The Service Industries Journal*, 28(6), 845–860. <https://doi.org/10.1080/02642060801990403>
- Arnould, E. J., Price, L. L., & Malshe, E. (2006). Toward a cultural resource-based theory of the customer. In R. F. Lusch, & S. L. Vargo (Eds.), *The Service-Dominant Logic of Marketing: Dialog, Debate, and Directions* (pp. 109–122). Routledge. <https://doi.org/10.4324/9781315699035-16>

- Aspara, J., Hietanen, J., & Tikkanen, H. (2010). Business model innovation vs replication: Financial performance implications of strategic emphases. *Journal of Strategic Marketing*, 18(1), 39–56. <https://doi.org/10.1080/09652540903511290>
- Aspara, J., Lamberg, J.-A., Laukia, A., & Tikkanen, H. (2013). Corporate business model transformation and inter-organizational cognition: The case of Nokia. *Long Range Planning*, 46(6), 459–474. <https://doi.org/10.1016/j.lrp.2011.06.001>
- Backhaus, K., Erichson, B., Plinke, W., & Weiber, R. (2016). *Multivariate Analysemethoden: Eine anwendungsorientierte Einführung* (14th ed.). Springer Gabler.
- Baden-Fuller, C., & Morgan, M. S. (2010). Business models as models. *Long Range Planning*, 43(2/3), 156–171. <https://doi.org/10.1016/j.lrp.2010.02.005>
- Baker, T., & Nelson, R. E. (2005). Creating something from nothing: Resource construction through entrepreneurial bricolage. *Administrative Science Quarterly*, 50(3), 329–366. <https://doi.org/10.2189/asqu.2005.50.3.329>
- Baker, W. E., & Faulkner, R. R. (1991). Role as resource in the Hollywood film industry. *American Journal of Sociology*, 97(2), 279–309. <https://doi.org/10.1086/229780>
- Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>
- Barney, J. B. (1995). Looking inside for competitive advantage. *Academy of Management Perspectives*, 9(4), 49–61. <https://doi.org/10.5465/ame.1995.9512032192>
- Barney, J. B., & Arikan, A. (2006). The resource-based view: Origins and implications. In M. A. Hitt (Ed.), *Handbooks in management. The Blackwell handbook of strategic management* (pp. 124–185). Blackwell. <https://doi.org/10.4337/9780857938688>
- Baron, S., & Warnaby, G. (2011). Individual customers' use and integration of resources: Empirical findings and organizational implications in the context of value co-creation. *Industrial Marketing Management*, 40(2), 211–218. <https://doi.org/10.1016/j.indmaman.2010.06.033>
- Bates, F. L., & Harvey, C. C. (1975). *The structure of social systems*. Gardner Press. <https://doi.org/10.2307/2065863>
- Bathelt, H., Kogler, D. F., & Munro, A. K. (2010). A knowledge-based typology of university spin-offs in the context of regional economic development. *Technovation*, 30(9/10), 519–532. <https://doi.org/10.1016/j.technovation.2010.04.003>
- Battistella, C., & Nonino, F. (2012). Exploring the impact of motivations on the attraction of innovation roles in open innovation web-based platforms. *Production Planning and Control*, 24(2/3), 226–245. <https://doi.org/10.1080/09537287.2011.647876>
- Baxter, P., & Jack, S. (2010). Qualitative case study methodology: Study design and implementation for novice researchers. *Qualitative Report*, 13(4), 544–559. <https://doi.org/10.46743/2160-3715/2008.1573>
- Bazeley, P., & Jackson, K. (2007). *Qualitative data analysis with NVivo*. Sage Publications. <https://doi.org/10.1080/14780887.2014.992750>
- Bechmann, A., & Lomborg, S. (2013). Mapping actor roles in social media: Different perspectives on value creation in theories of user participation. *New Media & Society*, 15(5), 765–781. <https://doi.org/10.1177/1461444812462853>

- Beckman, S. L., & Barry, M. (2007). Innovation as a learning process: Embedding design thinking. *California Management Review*, 50(1), 25–56. <https://doi.org/10.2307/41166415>
- Belussi, F., Orsi, L., & Savarese, M. (2019). Mapping business model research: A document bibliometric analysis. *Scandinavian Journal of Management*, 35(3), 101048. <https://doi.org/10.1016/j.scaman.2019.101048>
- Bendapudi, N., & Leone, R. P. (2003). Psychological implications of customer participation in co-production. *Journal of Marketing*, 67(1), 14–28. <https://doi.org/10.1509/jmkg.67.1.14.18592>
- Berekoven, L., Eckert, W., & Ellenrieder, P. (1989). *Marktforschung: Methodische Grundlagen und praktische Anwendung* (4th rev. ed.). Springer Gabler. <https://doi.org/10.1007/978-3-322-91732-4>
- Berekoven, L., Eckert, W., & Ellenrieder, P. (2009). *Marktforschung* (12th ed.). Springer Gabler. <https://doi.org/10.1007/978-3-322-91732-4>
- Berends, H., Smits, A., Reymen, I., & Podoyntsina, K. (2016). Learning while (re)configuring: Business model innovation processes in established firms. *Strategic Organization*, 14(3), 181–219. <https://doi.org/10.1177/1476127016632758>
- Berends, L. (2011). Embracing the visual: Using timelines with in-depth interviews on substance use and treatment. *Qualitative Report*, 16(1), 1–9. <https://doi.org/10.46743/2160-3715/2011.1036>
- Berglund, H., & Sandström, C. (2013). Business model innovation from an open systems perspective: Structural challenges and managerial solutions. *International Journal of Product Development*, 18(3/4), 274–285. <https://doi.org/10.1504/IJPD.2013.055011>
- Bhide, A. V. (2000). *The origin and evolution of new businesses*. Oxford University Press.
- Biddle, B. J. (1979). *Role theory: Expectations, identities, and behaviors*. Academic Press. <https://doi.org/10.1177/000169938202500214>
- Biddle, B. J. (1986). Recent developments in role theory. *Annual Review of Sociology*, 12(1), 67–92. <https://doi.org/10.1146/annurev.so.12.080186.000435>
- Bieger, T., zu Knyphausen-Aufseß, D., & Krys, C. (Eds.). (2011). *Innovative Geschäftsmodelle*. Springer-Verlag.
- Bieger, T., & Reinhold, S. (2011). Das wertbasierte Geschäftsmodell: Ein aktualisierter Strukturierungsansatz. In T. Bieger, D. zu Knyphausen-Aufseß, & C. Krys (Eds.), *Innovative Geschäftsmodelle* (pp. 13–70). Springer-Verlag. https://doi.org/10.1007/978-3-642-18068-2_2
- Bijmolt, T. H. A., Leeflang, P. S. H., Block, F., Eisenbeiss, M., Hardie, B. G. S., Lemmens, A., & Saffert, P. (2010). Analytics for customer engagement. *Journal of Service Research*, 13(3), 341–356. <https://doi.org/10.1177/1094670510375603>
- Birley, S. (1985). The role of networks in the entrepreneurial process. *Journal of Business Venturing*, 1(1), 107–117. [https://doi.org/10.1016/0883-9026\(85\)90010-2](https://doi.org/10.1016/0883-9026(85)90010-2)
- 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. <https://doi.org/10.1016/j.respol.2009.07.006>

- Björkdahl, J., & Holmén, M. (2013). Business model innovation – the challenges ahead. *International Journal of Product Development*, 18(3/4), 213–225.
- Blank, S., & Dorf, B. (2012). *The startup owner's manual: The step-by-step guide for building a great company*. K&S Ranch.
- Blank, S. G. (2005). *The four steps to the epiphany: Successful strategies for products that win*. Cafe Press.
- Blasco-Arcas, L., Alexander, M. J., Sörhammar, D., Jonas, J. M., Raithel, S., & Chen, T. (2020). Organizing actor engagement: A platform perspective. *Journal of Business Research*, 118, 74–85. <https://doi.org/10.1016/j.jbusres.2020.06.050>
- Bloor, M., & Wood, F. (2006). *Keywords in qualitative methods: A vocabulary of research concepts*. Sage Publications. <https://dx.doi.org/10.4135/9781849209403>
- Bock, A. J., Opsahl, T., George, G., & Gann, D. M. (2012). The effects of culture and structure on strategic flexibility during business model innovation. *Journal of Management Studies*, 49(2), 279–305. <https://doi.org/10.1111/j.1467-6486.2011.01030.x>
- Bocken, N., Boons, F., & Baldassarre, B. (2019). Sustainable business model experimentation by understanding ecologies of business models. *Journal of Cleaner Production*, 208, 1498–1512. <https://doi.org/10.1016/j.jclepro.2018.10.159>
- Bocken, N., & Short, S. W. (2016). Towards a sufficiency-driven business model: Experiences and opportunities. *Environmental Innovation and Societal Transitions*, 18, 41–61. <https://doi.org/10.1016/j.eist.2015.07.010>
- Bocken, N., & Snihur, Y. (2020). Lean startup and the business model: Experimenting for novelty and impact. *Long Range Planning*, 53(4), 101953. <https://doi.org/10.1016/j.lrp.2019.101953>
- Böhler, H. (2004). *Marktforschung* (3rd ed.). Kohlhammer.
- Böhm, M., Hein, A., Hermes, S., Lurz, M., Poszler, F., Ritter, A.-C., Setzke, D. S., Weking, J., Welpel, I. M., & Krcmar, H. (2019). *Die Rolle von Startups im Innovationssystem: Eine qualitativ-empirische Untersuchung* (Studien zum deutschen Innovationssystem No. 12-2019). Expertenkommission Forschung und Innovation. <https://www.econstor.eu/handle/10419/194282>
- Bojovic, N., Genet, C., & Sabatier, V. (2018). Learning, signaling, and convincing: The role of experimentation in the business modeling process. *Long Range Planning*, 51(1), 141–157. <https://doi.org/10.1016/j.lrp.2017.09.001>
- Bonaccorsi, A., Giannangeli, S., & Rossi, C. (2006). Entry strategies under competing standards: Hybrid business models in the open source software industry. *Management Science*, 52(7), 1085–1098. <https://doi.org/10.1287/mnsc.1060.0547>
- Bonakdar, A. (2015). *Business model innovation: Studies on business model design, protection, and anchoring* [Doctoral dissertation, University of St. Gallen]. Schweizerische Nationalbibliothek NB. <https://www.e-helvetica.nb.admin.ch/api/download/urn%3anbn%3ach%3abel-462618%3adis4334.pdf>
- Boos, F., & Heitger, B. (1996). Kunst oder Technik? Der Projektmanager als sozialer Architekt. In H. Balck (Ed.), *Networking und Projektorientierung* (pp. 165–182). Springer-Verlag. https://doi.org/10.1007/978-3-642-61418-7_9

- Borchardt, A., & Göthlich, S. E. (2009). Erkenntnisgewinnung durch Fallstudien. In S. Albers, D. Klapper, U. Konradt, A. Walter, & J. Wolf (Eds.), *Methodik der empirischen Forschung* (3rd ed., pp. 33–48). Springer Gabler. https://doi.org/10.1007/978-3-8349-9121-8_3
- Borgmann, J. (2012). *Dynamic Capabilities als Einflussfaktoren des Markteintrittstimings: Modellierung und empirische Analyse am Beispiel von B2C-Start-up-Unternehmen im E-Business* [Doctoral dissertation, Handelshochschule Leipzig]. Springer Gabler. <https://doi.org/10.1007/978-3-8349-7182-1>
- Bouwman, H., Nikou, S., Molina-Castillo, F. J., & de Reuver, M. (2018). The impact of digitalization on business models. *Digital Policy, Regulation and Governance*, 20(2), 105–124. <https://doi.org/10.1108/DPRG-07-2017-0039>
- Bowden, J. L.-H. (2009). The process of customer engagement: A conceptual framework. *Journal of Marketing Theory and Practice*, 17(1), 63–74. <https://doi.org/10.2753/MTP1069-6679170105>
- Bowden, J. L.-H., Luoma-Aho, V., & Naumann, K. (2016). Developing a spectrum of positive to negative citizen engagement. In R. J. Brodie, L. D. Hollebeek, & J. Conduit (Eds.), *Customer engagement: Contemporary issues and challenges* (pp. 257–277). Routledge, Taylor & Francis Group.
- Bower, D. J. (2003). Business model fashion and the academic spinout firm. *R&D Management*, 33(2), 97–106. <https://doi.org/10.1111/1467-9310.00285>
- Bramwell, A., Hepburn, N., & Wolfe, D. A. (2019). Growing entrepreneurial ecosystems. *Journal of Entrepreneurship and Public Policy*, 8(2), 272–292. <https://doi.org/10.1108/JEPP-04-2019-0034>
- Brass, D. J., Galaskiewicz, J., & Greve, H. R. (2004). Taking stock of networks and organizations: A multilevel perspective. *Academy of Management Journal*, 47(6), 795–817. <https://doi.org/10.2307/20159624>
- Breidbach, C. F., & Brodie, R. J. (2017). Engagement platforms in the sharing economy. *Journal of Service Theory and Practice*, 27(4), 761–777. <https://doi.org/10.1108/JSTP-04-2016-0071>
- Breidbach, C. F., Brodie, R. J., & Hollebeek, L. (2014). Beyond virtuality: From engagement platforms to engagement ecosystems. *Managing Service Quality*, 24(6), 592–611. <https://doi.org/10.1108/MSQ-08-2013-0158>
- Brenk, S., & Lüttgens, D. (2015, June 14). *Business model design: Process model development through design science research* [Conference Paper]. XXVI ISPIM Conference, Budapest, Hungary.
- Brettel, M., Strese, S., & Flatten, T. C. (2012). Improving the performance of business models with relationship marketing efforts – An entrepreneurial perspective. *European Management Journal*, 30(2), 85–98. <https://doi.org/10.1016/j.emj.2011.11.003>
- Breuer, H. (2013). Lean venturing: Learning to create new business through exploration, elaboration, evaluation, experimentation, and evolution. *International Journal of Innovation Management*, 17(3), 1–22. <https://doi.org/10.1142/S1363919613400136>
- Breznitz, S. M., Clayton, P. A., Defazio, D., & Isett, K. R. (2018). Have you been served? The impact of university entrepreneurial support on start-ups' network formation. *The Journal of Technology Transfer*, 43(2), 343–367. <https://doi.org/10.1007/s10961-017-9565-0>

- Brodie, R. J., Fehrer, J. A., Jaakkola, E., & Conduit, J. (2019). Actor engagement in networks: Defining the conceptual domain. *Journal of Service Research*, 22(2), 173–188. <https://doi.org/10.1177/1094670519827385>
- Brodie, R. J., & Hollebeek, L. D. (2011). Response: Advancing and consolidating knowledge about customer engagement. *Journal of Service Research*, 14(3), 283–284. <https://doi.org/10.1177/1094670511415523>
- Brodie, R. J., Hollebeek, L. D., Jurić, B., & Ilić, A. (2011). Customer engagement. *Journal of Service Research*, 14(3), 252–271. <https://doi.org/10.1177/1094670511411703>
- Brodie, R. J., Ilic, A., Juric, B., & Hollebeek, L. (2013). Consumer engagement in a virtual brand community: An exploratory analysis. *Journal of Business Research*, 66(1), 105–114. <https://doi.org/10.1016/j.jbusres.2011.07.029>
- Brousseau, E., & Penard, T. (2007). The economics of digital business models: A framework for analyzing the economics of platforms. *Review of Network Economics*, 6(2), 1–34. <https://doi.org/10.2202/1446-9022.1112>
- Bucherer, E. (2010). *Business model innovation – guidelines for a structured approach* [Doctoral dissertation, University of St. Gallen]. Shaker-Verlag. <https://www.shaker.de/de/content/catalogue/index.asp?lang=de&ID=8&ISBN=978-3-8322-9663-6>
- 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. <https://doi.org/10.1111/j.1467-8691.2012.00637.x>
- Bullinger, H.-J. (1994). *Einführung in das Technologiemanagement: Modelle, Methoden, Praxisbeispiele*. Vieweg+Teubner Verlag. <https://doi.org/10.1007/978-3-322-84858-1>
- Bundesministerium für Wirtschaft unnd Klimaschutz. (2020). *Deutschlands Wirtschaftsbranchen im Fokus*. <https://www.bmwi.de/Navigation/DE/Service/Branchenfokus/branchenfokus.html>
- Burt, R. S. (1992). *Structural holes*. Harvard University Press.
- Butzin, A., & Terstriep, J. (2018). Actors and roles in social innovation. In J. Howaldt, C. Kaletka, A. Schröder, & M. Zimgiebl (Eds.), *Atlas of social innovation: New practices for a better future* (pp. 78–81). Technische Universität Dortmund.
- Calder, B. J., Malthouse, E. C., & Maslowska, E. (2016). Brand marketing, big data and social innovation as future research directions for engagement. *Journal of Marketing Management*, 32(5/6), 579–585. <https://doi.org/10.1080/0267257X.2016.1144326>
- Callero, P. L. (1994). From role-playing to role-using: Understanding role as resource. *Social Psychology Quarterly*, 57(3), 228–243. <https://doi.org/2786878>
- Camuffo, A., Cordova, A., Gambardella, A., & Spina, C. (2020). A scientific approach to entrepreneurial decision making: Evidence from a randomized control trial. *Management Science*, 66(2), 564–586. <https://doi.org/10.1287/mnsc.2018.3249>
- Caniëls, M. C., & Romijn, H. A. (2008). Actor networks in strategic niche management: Insights from social network theory. *Futures*, 40(7), 613–629. <https://doi.org/10.1016/j.futures.2007.12.005>

- Cantù, C., Corsaro, D., & Snehota, I. (2012). Roles of actors in combining resources into complex solutions. *Journal of Business Research*, 65(2), 139–150. <https://doi.org/10.1016/j.jbusres.2011.05.013>
- Carvalho, A., & Fernandes, T. (2018). Understanding customer brand engagement with virtual social communities: A comprehensive model of drivers, outcomes and moderators. *Journal of Marketing Theory and Practice*, 26(1/2), 23–37. <https://doi.org/10.1080/10696679.2017.1389241>
- Casadesus-Masanell, R., & Zhu, F. (2010). Strategies to fight ad-sponsored rivals. *Management Science*, 56(9), 1484–1499. <https://doi.org/10.1287/mnsc.1100.1199>
- Casadesus-Masanell, R., & Zhu, F. (2013). Business model innovation and competitive imitation: The case of sponsor-based business models. *Strategic Management Journal*, 34(4), 464–482. <https://doi.org/10.1002/smj.2022>
- Casadesus-Masanell, R., & Ricart, J. E. (2010). Competitiveness: Business model reconfiguration for innovation and internationalization. *Management Research: Journal of the Iberoamerican Academy of Management*, 8(2), 123–149. <https://doi.org/10.1108/1536-541011066470>
- Cavalcante, S., Kesting, P., & Ulhøi, J. (2011). Business model dynamics and innovation: (Re)establishing the missing linkages. *Management Decision*, 49(8), 1327–1342. <https://doi.org/10.1108/00251741111163142>
- Chell, E., & Baines, S. (2000). Networking, entrepreneurship and microbusiness behaviour. *Entrepreneurship & Regional Development*, 12(3), 195–215. <https://doi.org/10.1080/089856200413464>
- Chervonnaya, O. (2003). Customer role and skill trajectories in services. *International Journal of Service Industry Management*, 14(3), 347–363. <https://doi.org/10.1108/09564230310478864>
- Chesbrough, H. (2007). Business model innovation: It's not just about technology anymore. *Strategy & Leadership*, 35(6), 12–17. <https://doi.org/10.1108/10878570710833714>
- Chesbrough, H. (2010). Business model innovation: Opportunities and barriers. *Long Range Planning*, 43(2/3), 354–363. <https://doi.org/10.1016/j.lrp.2009.07.010>
- Chesbrough, H., & Rosenbloom, R. S. (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. <https://doi.org/10.1093/icc/11.3.529>
- Chetty, S., Ojala, A., & Leppäaho, T. (2015). Effectuation and foreign market entry of entrepreneurial firms. *European Journal of Marketing*, 49(9/10), 1436–1459. <https://doi.org/10.1108/EJM-11-2013-0630>
- Chou, H.-H., & Zolkiewski, J. (2012). Managing resource interaction as a means to cope with technological change. *Journal of Business Research*, 65(2), 188–195. <https://doi.org/10.1016/j.jbusres.2011.05.021>
- Christensen, C. M. (1997). *The innovator's dilemma: When new technologies cause great firms to fall*. Harvard Business School Press.

- Clarysse, B., Bruneel, J., & Wright, M. (2011). Explaining growth paths of young technology-based firms: Structuring resource portfolios in different competitive environments. *Strategic Entrepreneurship Journal*, 5(2), 137–157. <https://doi.org/10.1002/sej.111>
- Clarysse, B., Wright, M., Bruneel, J., & Mahajan, A. (2014). Creating value in ecosystems: Crossing the chasm between knowledge and business ecosystems. *Research Policy*, 43(7), 1164–1176. <https://doi.org/10.1016/j.respol.2014.04.014>
- Clauss, T. (2017). Measuring business model innovation: Conceptualization, scale development, and proof of performance. *R&D Management*, 47(3), 385–403. <https://doi.org/10.1111/radm.12186>
- Coleman, J. S. (1990). *Foundations of social theory*. Belknap Press of Harvard University Press.
- Comberg, C., Seith, F., German, A., & Velamuri, V. K. (2014, June 8). *Pivots in startups: Factors influencing business model innovation in startups* [Conference Paper]. XXV ISPIM – Innovation for Sustainable Economy & Society, Dublin, Ireland.
- Conduit, J., & Chen, T. (2017). Transcending and bridging co-creation and engagement: Conceptual and empirical insights. *Journal of Service Theory and Practice*, 27(4), 714–720. <https://doi.org/10.1108/JSTP-05-2017-0077>
- Contigiani, A. (2019, June 19-21). *Experimentation, learning, and appropriability in early-stage ventures* [Conference Paper]. DRUID19, Copenhagen, Denmark.
- Cook, C., Heath, F., & Thompson, R. L. (2000). A meta-analysis of response rates in web- or internet-based surveys. *Educational and Psychological Measurement*, 60(6), 821–836. <https://doi.org/10.1177/00131640021970934>
- Coombes, P. H., & Nicholson, J. D. (2013). Business models and their relationship with marketing: A systematic literature review. *Industrial Marketing Management*, 42(5), 656–664. <https://doi.org/10.1016/j.indmarman.2013.05.005>
- Corbin, J. M., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology*, 13(1), 3–21. <https://doi.org/10.1007/BF00988593>
- Cortimiglia, M. N., Ghezzi, A., & Frank, A. G. (2016). Business model innovation and strategy making nexus: Evidence from a cross-industry mixed-methods study. *R&D Management*, 46(3), 414–432. <https://doi.org/10.1111/radm.12113>
- Cucculelli, M., & Bettinelli, C. (2015). Business models, intangibles and firm performance: Evidence on corporate entrepreneurship from Italian manufacturing SMEs. *Small Business Economics*, 45(2), 329–350. <https://doi.org/10.1007/s11187-015-9631-7>
- Dahan, N. M., Doh, J. P., Oetzel, J., & Yaziji, M. (2010). Corporate-NGO collaboration: Co-creating new business models for developing markets. *Long Range Planning*, 43(2-3), 326–342. <https://doi.org/10.1016/j.lrp.2009.11.003>
- Dahrendorf, R. (1958). *Homo Sociologicus: Ein Versuch zur Geschichte, Bedeutung und Kritik der Kategorie der sozialen Rolle*. Springer VS.
- Dahrendorf, R. (2006). *Homo Sociologicus: Ein Versuch zur Geschichte, Bedeutung und Kritik der Kategorie der sozialen Rolle* (16th ed.). Springer VS. <https://doi.org/10.1007/978-3-531-90216-6>

- Day, G. S., Deighton, J., Narayandas, D., Gummesson, E., Hunt, S. D., Prahalad, C. K., Rust, R. T., Shugan, S. M., & Bolton, R. N. (2004). Invited commentaries on “Evolving to a new dominant logic for marketing”. *Journal of Marketing*, 68(1), 18–27. <https://doi.org/10.1509/jmkg.68.1.18.24035>
- de Hoyos-Ruperto, M., Romaguera, R. M., Carlsson, B., & Lyytinen, K. (2013). Networking: A critical success factor for entrepreneurship. *American Journal of Management*, 13(2), 55–72.
- 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. <https://doi.org/10.1504/IJEB.2009.026530>
- Dedehayir, O., Mäkinen, S. J., & Roland Ortt, J. (2018). Roles during innovation ecosystem genesis: A literature review. *Technological Forecasting and Social Change*, 136(C), 18–29. <https://doi.org/10.1016/j.techfore.2016.11.028>
- Dedehayir, O., & Seppänen, M. (2015). Birth and expansion of innovation ecosystems: A case study of copper production. *Journal of Technology Management & Innovation*, 10(2), 145–154. <https://doi.org/10.4067/S0718-27242015000200010>
- Demil, B., & Lecocq, X. (2010). Business model evolution: In search of dynamic consistency. *Long Range Planning*, 43(2/3), 227–246. <https://doi.org/10.1016/j.lrp.2010.02.004>
- Desouza, K. C., Awazu, Y., Jha, S., Dombrowski, C., Papagari, S., Baloh, P., & Kim, J. Y. (2008). Customer driven innovation. *Research-Technology Management*, 51(3), 35–44. <https://doi.org/10.1080/08956308.2008.11657503>
- Dessart, L., Veloutsou, C., & Morgan-Thomas, A. (2015). Consumer engagement in online brand communities: A social media perspective. *Journal of Product & Brand Management*, 24(1), 28–42. <https://doi.org/10.1108/JPBM-06-2014-0635>
- Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2011). On the entrepreneurial genesis of new markets: Effectual transformations versus causal search and selection. *Journal of Evolutionary Economics*, 21(2), 231–253. <https://doi.org/10.1007/s00191-010-0185-1>
- Dholakia, U. M., Blazevic, V., Wiertz, C., & Algesheimer, R. (2009). Communal service delivery. *Journal of Service Research*, 12(2), 208–226. <https://doi.org/10.1177/1094670509338618>
- Dickey, M. R. (2014, March 20). *Airbnb might soon be worth \$10 billion, valued more than Hyatt hotels*. Insider. <https://www.businessinsider.com/airbnb-raising-at-10-billion-valuation-2014-3>
- Dimov, D. (2011). Grappling with the unbearable elusiveness of entrepreneurial opportunities. *Entrepreneurship Theory and Practice*, 35(1), 57–81. <https://doi.org/10.1111/j.15406520.2010.00423.x>
- Disselkamp, M. (2012). *Innovationsmanagement: Instrumente und Methoden Zur Umsetzung Im Unternehmen* (2nd ed.). Springer-Verlag.
- Dmitriev, V., Simmons, G., Truong, Y., Palmer, M., & Schneckenberg, D. (2014). An exploration of business model development in the commercialization of technology innovations. *R&D Management*, 44(3), 306–321. <https://doi.org/10.1111/radm.12066>

- Doganova, L., & Eyquem-Renault, M. (2009). What do business models do? *Research Policy*, 38(10), 1559–1570. <https://doi.org/10.1016/j.respol.2009.08.002>
- Dolan, R., Conduit, J., Fahy, J., & Goodman, S. (2016). Social media engagement behaviour: A uses and gratifications perspective. *Journal of Strategic Marketing*, 24(3/4), 261–277. <https://doi.org/10.1080/0965254X.2015.1095222>
- Dong, B., & Sivakumar, K. (2017). Customer participation in services: Domain, scope, and boundaries. *Journal of the Academy of Marketing Science*, 45(6), 944–965. <https://doi.org/10.1007/s11747-017-0524-y>
- Dresing, T., & Pehl, T. (2015). *Praxisbuch Interview, Transkription & Analyse. Anleitungen und Regelsysteme für qualitativ Forschende* (6th ed.). Self-published.
- Drucker, P. F. (1954). *The practice of management*. Harper & Row.
- Dubois, A., & Gadde, L.-E. (2002). Systematic combining: An abductive approach to case research. *Journal of Business Research*, 55(7), 553–560. [https://doi.org/10.1016/S0148-2963\(00\)00195-8](https://doi.org/10.1016/S0148-2963(00)00195-8)
- Dubosson-Torbay, M., Osterwalder, A., & Pigneur, Y. (2002). E-business model design, classification, and measurements. *Thunderbird International Business Review*, 44(1), 5–23. <https://doi.org/10.1002/tie.1036>
- Dunford, R., Palmer, I., & Benveniste, J. (2010). Business model replication for early and rapid internationalisation. *Long Range Planning*, 43(5/6), 655–674. <https://doi.org/10.1016/j.lrp.2010.06.004>
- Dwivedi, A. (2015). A higher-order model of consumer brand engagement and its impact on loyalty intentions. *Journal of Retailing and Consumer Services*, 24, 100–109. <https://doi.org/10.1016/j.jretconser.2015.02.007>
- Dyer, W. G., & Wilkins, A. L. (1991). Better stories, not better constructs, to generate better theory: A rejoinder to Eisenhardt. *Academy of Management Review*, 16(3), 613–619. <https://doi.org/10.5465/amr.1991.4279492>
- Eagly, A. H., & Wood, W. (2016). Social role theory of sex differences. In N. A. Naples, J. M. Ryan, R. C. Hoogland, M. Wickramasing, W. C. A. Wong, J. B. Mendez, T. Boellstorff, C. Hundleby, E. Magnusson, P. Mahdavi, A. Pande, M. del Pilar Grazioso, M. Prah, D. Riggs, J. M. Ryan, C. M. B. Sardenberg, T. St. Germain, & B. Winter (Eds.), *The Wiley Blackwell Encyclopedia of Gender and Sexuality Studies* (pp. 458–476). American Cancer Society.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, 14(4), 532–550. <https://doi.org/10.5465/amr.1989.4308385>
- Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, 50(1), 25–32. <https://doi.org/10.5465/amj.2007.24160888>
- Eisenmann, T. R., Ries, E., & Dillard, S. (2012). *Hypothesis-driven entrepreneurship: The lean startup*. Harvard Business School Press.

- Ekman, P., Røndell, J. G., Anastasiadou, E., Kowalkowski, C., Raggio, R. D., & Thompson, S. M. (2021). Business actor engagement: Exploring its antecedents and types. *Industrial Marketing Management*, 98, 179–192. <https://doi.org/10.1016/j.indmarman.2021.08.009>
- Fehrer, J. A., Woratschek, H., Germelmann, C. C., & Brodie, R. J. (2018). Dynamics and drivers of customer engagement: Within the dyad and beyond. *Journal of Service Management*, 29(3), 443–467. <https://doi.org/10.1108/JOSM-08-2016-0236>
- Felin, T., Foss, N. J., & Ployhart, R. E. (2015). The microfoundations movement in strategy and organization theory. *The Academy of Management Annals*, 9(1), 575–632. <https://doi.org/10.1080/19416520.2015.1007651>
- Felin, T., Gambardella, A., Stern, S., & Zenger, T. (2020). Lean startup and the business model: Experimentation revisited. *Long Range Planning*, 53(4), 101889. <https://doi.org/10.1016/j.lrp.2019.06.002>
- Felin, T., & Zenger, T. R. (2009). Entrepreneurs as theorists: On the origins of collective beliefs and novel strategies. *Strategic Entrepreneurship Journal*, 3(2), 127–146. <https://doi.org/10.1002/sej.67>
- Ferguson, R., Schattke, K., & Paulin, M. (2016). The social context for value co-creations in an entrepreneurial network. *International Journal of Entrepreneurial Behavior & Research*, 22(2), 199–214. <https://doi.org/10.1108/IJEER-04-2015-0100>
- Ferreira, F. N. H., Proença, J. F., Spencer, R., & Cova, B. (2013). The transition from products to solutions: External business model fit and dynamics. *Industrial Marketing Management*, 42(7), 1093–1101. <https://doi.org/10.1016/j.indmarman.2013.07.010>
- Field, A. (2013). *Discovering statistics using IBM SPSS Statistics* (4th ed.). Sage Publications.
- Fielt, E. (2013). Conceptualising business models: Definitions, frameworks and classifications. *Journal of Business Models*, 1(1), 85–105. <https://doi.org/10.5278/OJS.JBM.V1I1.706>
- Fini, R., Fu, K., Mathisen, M. T., Rasmussen, E., & Wright, M. (2017). Institutional determinants of university spin-off quantity and quality: A longitudinal, multilevel, cross-country study. *Small Business Economics*, 48(2), 361–391. <https://doi.org/10.1007/s11187-016-9779-9>
- Finsterwalder, J. (2018). A 360-degree view of actor engagement in service co-creation. *Journal of Retailing and Consumer Services*, 40, 276–278. <https://doi.org/10.1016/j.jretconser.2016.08.005>
- Fisher, G. (2012). Effectuation, causation, and bricolage: A behavioral comparison of emerging theories in entrepreneurship research. *Entrepreneurship Theory and Practice*, 36(5), 1019–1051. <https://doi.org/10.1111/j.1540-6520.2012.00537.x>
- Fjeldstad, Ø. D., & Snow, C. C. (2018). Business models and organization design. *Long Range Planning*, 51(1), 32–39. <https://doi.org/10.1016/j.lrp.2017.07.008>
- Foa, U. G. (1971). Interpersonal and economic resources: Their structure and differential properties offer new insights into problems of modern society. *Science*, 171(3969), 345–351. <https://doi.org/10.1126/science.171.3969.345>
- Foa, U. G., & Foa, E. B. (1976). Resource theory of social exchange. In J. W. Thibaut (Ed.), *Contemporary topics in social psychology* (pp. 99–135). General Learning Press.

- Ford, D., Cova, B., & Salle, R. (2010, September 2-4). *Merchants, banks, builders and bastards: Towards a parsimonious analysis of socio-economic behaviour* [Conference Paper]. IMP-Conference, Budapest, Hungary.
- Forrester, J. W. (1958). Industrial dynamics: A major breakthrough for decision makers. *Harvard Business Review*, 36(4), 37–66. <https://doi.org/10.1225/58404>
- Foss, N. J., & Saebi, T. (2017a). Business models and business model innovation: Between wicked and paradigmatic problems. *Long Range Planning*, 51(1), 9–21. <https://doi.org/10.1016/j.lrp.2017.07.006>
- Foss, N. J., & Saebi, T. (2017b). Fifteen years of research on business model innovation. *Journal of Management*, 43(1), 200–227. <https://doi.org/10.1177/0149206316675927>
- 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(3/4), 249–273. <https://doi.org/10.1504/IJPD.2013.055012>
- Frohman, A. L. (1978). The performance of innovation: Managerial roles. *California Management Review*, 20(3), 5–12. <https://doi.org/10.2307/41165277>
- Frow, P., Nenonen, S., Payne, A., & Storbacka, K. (2015). Managing co-creation design: A strategic approach to innovation. *British Journal of Management*, 26(3), 463–483. <https://doi.org/10.1111/1467-8551.12087>
- Füller, J. (2010). Refining virtual co-creation from a consumer perspective. *California Management Review*, 52(2), 98–122. <https://doi.org/10.1525/cm.2010.52.2.98>
- Füller, J., Hutter, K., Hautz, J., & Matzler, K. (2014). User roles and contributions in innovation-contest communities. *Journal of Management Information Systems*, 31(1), 273–308. <https://doi.org/10.2753/MIS0742-1222310111>
- Futterer, F., Schmidt, J., & Heidenreich, S. (2018). Effectuation or causation as the key to corporate venture success? Investigating effects of entrepreneurial behaviors on business model innovation and venture performance. *Long Range Planning*, 51(1), 64–81. <https://doi.org/10.1016/j.lrp.2017.06.008>
- Galbraith, J. R. (1982). Designing the innovating organization. *Organizational Dynamics*, 10(3), 5–25. [https://doi.org/10.1016/0090-2616\(82\)90033-X](https://doi.org/10.1016/0090-2616(82)90033-X)
- Gambardella, A., & McGahan, A. M. (2010). Business-model innovation: General purpose technologies and their implications for industry structure. *Long Range Planning*, 43(2/3), 262–271. <https://doi.org/10.1016/j.lrp.2009.07.009>
- Gans, J., Stern, S., & Wu, J. (2019). Foundations of entrepreneurial strategy. *Strategic Management Journal*, 40(5), 736–756. <https://doi.org/10.1002/smj.3010>
- Gassmann, O., Frankenberger, K., & Csik, M. (2013). *Geschäftsmodelle entwickeln: 55 innovative Konzepte mit dem St. Galler Business Model Navigator*. Hanser Verlag. <https://doi.org/10.3139/9783446452848.fm>
- Gassmann, O., Frankenberger, K., & Sauer, R. (2017). A primer on theoretically exploring the field of business model innovation. *The European Business Review*, 45–48. <https://www.europeanbusinessreview.com/a-primer-on-theoretically-exploring-the-field-of-busines-model-innovation/>

- Gavetti, G., & Levinthal, D. (2000). Looking forward and looking backward: Cognitive and experiential search. *Administrative Science Quarterly*, 45(1), 113–137. <https://doi.org/10.2307/2666981>
- Geissdoerfer, M., Vladimirova, D., van Fossen, K., & Evans, S. (2018). Product, service, and business model innovation: A discussion. *Procedia Manufacturing*, 21, 165–172. <https://doi.org/10.1016/j.promfg.2018.02.107>
- Geissdoerfer, M., & Weerdmeester, R. (2019). Managing business model innovation for relocalization in the process and manufacturing industry. *Journal of Business Chemistry*, 16(1), 11–25. <https://doi.org/10.17879/76199421565>
- Gemünden, H. G. (1985). Promotors—key persons for the development and marketing of innovative industrial products. In K. Backhaus, & D. T. Wilson (Eds.), *Industrial marketing: A German-American perspective* (pp. 134–166). Springer-Verlag.
- Gemünden, H. G., Salomo, S., & Hölzle, K. (2007). Role models for radical innovations in times of open innovation. *Creativity and Innovation Management*, 16(4), 408–421. <https://doi.org/10.1111/j.1467-8691.2007.00451.x>
- George, G., & Bock, A. J. (2010). The business model in practice and its implications for entrepreneurship research. *Entrepreneurship Theory and Practice*, 35(1), 83–111. <https://doi.org/10.1111/j.1540-6520.2010.00424.x>
- Gerpott, T. J. (2005). *Strategisches Technologie- und Innovationsmanagement*. Schäffer-Poeschel Verlag.
- Gerring, J. (2007). *Case study research: Principles and practices*. Cambridge University Press.
- Ghezzi, A., & Cavallo, A. (2020). Agile business model innovation in digital entrepreneurship: Lean startup approaches. *Journal of Business Research*, 110(C), 519–537. <https://doi.org/10.1016/j.jbusres.2018.06.013>
- Gibson, C. B., & Birkinshaw, J. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*, 47(2), 209–226. <https://doi.org/10.2307/20159573>
- Giesen, E., Berman, S. J., Bell, R., & Blitz, A. (2007). Three ways to successfully innovate your business model. *Strategy & Leadership*, 35(6), 27–33. <https://doi.org/10.1108/10878570710833732>
- Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research. *Organizational Research Methods*, 16(1), 15–31. <https://doi.org/10.1177/1094428112452151>
- Girotra, K., & Netessine, S. (2014). Four paths to business model innovation. *Harvard Business Review*, 92(7/8), 96–103.
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Sociology Press.
- Gläser, J., & Laudel, G. (2010). *Experteninterviews und qualitative Inhaltsanalyse als Instrumente rekonstruierender Untersuchungen* (4th ed.). Springer VS.
- Goodman, J., Korsunova, A., & Halme, M. (2017). Our collaborative future: Activities and roles of stakeholders in sustainability-oriented innovation. *Business Strategy and the Environment*, 26(6), 731–753. <https://doi.org/10.1002/bse.1941>

- Goulding, I. (1983). New product development: A literature review. *European Journal of Marketing*, 17(3), 3–30. <https://doi.org/10.1108/EUM00000000004811>
- Gouthier, M., & Schmid, S. (2003). Customers and customer relationships in service firms: The perspective of the resource-based view. *Marketing Theory*, 3(1), 119–143. <https://doi.org/10.1177/1470593103003001007>
- Gramling, L. F., & Carr, R. L. (2004). Lifelines: A life history methodology. *Nursing Research*, 53(3), 207–210. <https://doi.org/10.1097/00006199-200405000-00008>
- Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology*, 78(6), 1360–1380.
- Greening, D. W., Barringer, B. R., & Macy, G. (1996). A qualitative study of managerial challenges facing small business geographic expansion. *Journal of Business Venturing*, 11(4), 233–256. [https://doi.org/10.1016/0883-9026\(95\)00108-5](https://doi.org/10.1016/0883-9026(95)00108-5)
- Greve, A., & Salaff, J. W. (2003). Social networks and entrepreneurship. *Entrepreneurship Theory and Practice*, 28(1), 1–22. <https://doi.org/10.1111/1540-8520.00029>
- Griese, H. M. (1989). Rolle. In G. Endruweit, & G. Trommsdorff (Eds.), *Wörterbuch der Soziologie: Band 2: Ich - Rückkopplung* (pp. 547–553). Enke Verlag.
- Griese, H. M., Nikles, B. W., & Riilcker, C. (1977). *Soziale Rolle: Zur Vermittlung von Individuum und Gesellschaft*. Leske Verlag + Budrich GmbH.
- Grönroos, C., & Gummerus, J. (2014). The service revolution and its marketing implications: Service logic vs service-dominant logic. *Managing Service Quality*, 24(3), 206–229. <https://doi.org/10.1108/MSQ-03-2014-0042>
- Grönroos, C., & Voima, P. (2013). Critical service logic: Making sense of value creation and co-creation. *Journal of the Academy of Marketing Science*, 41(2), 133–150. <https://doi.org/10.1007/s11747-012-0308-3>
- Gummerus, J., Liljander, V., Weman, E., & Pihlström, M. (2012). Customer engagement in a Facebook brand community. *Management Research Review*, 35(9), 857–877. <https://doi.org/10.1108/01409171211256578>
- Gustafsson, J. (2017). *Single case studies vs. multiple case studies: A comparative study* [Student paper, Halmstad University]. Högskolan i Halmstad Publications. <http://urn.kb.se/resolve?urn=urn:nbn:se:hh:diva-33017>
- Hacker, J. V., Bodendorf, F., & Lorenz, P. (2017). A framework to identify knowledge actor roles in enterprise social networks. *Journal of Knowledge Management*, 21(4), 817–838. <https://doi.org/10.1108/JKM-10-2016-0443>
- Hacking, I. (1983). *Representing and intervening: Introductory topics in the philosophy of natural science*. Cambridge University Press.
- Halinen, A., Törnroos, J.-Å., & Elo, M. (2013). Network process analysis: An event-based approach to study business network dynamics. *Industrial Marketing Management*, 42(8), 1213–1222. <https://doi.org/10.1016/j.indmarman.2013.05.001>
- Hallen, B. L., & Eisenhardt, K. M. (2012). Catalyzing strategies and efficient tie formation: How entrepreneurial firms obtain investment ties. *Academy of Management Journal*, 55(1), 35–70. <https://doi.org/10.5465/amj.2009.0620>

- Hamel, G (2000). Leading the revolution. *Strategy & Leadership*, 29(1), 4–10. <https://doi.org/10.1108/10878570110367141>
- Hampel, C., Perkmann, M., & Phillips, N. (2020). Beyond the lean start-up: Experimentation in corporate entrepreneurship and innovation. *Innovation*, 22(1), 1–11. <https://doi.org/10.1080/14479338.2019.1632713>
- Hannan, M. T., & Freeman, J. (1984). Structural inertia and organizational change. *American Sociological Review*, 49(2), 149-164. <https://doi.org/10.2307/2095567>
- Hanson, N. R. (1958). *Patterns of discovery: An inquiry into the conceptual foundations of science*. Cambridge University Press.
- Hardwick, J., & Anderson, A. R. (2019). Supplier-customer engagement for collaborative innovation using video conferencing: A study of SMEs. *Industrial Marketing Management*, 80, 43–57. <https://doi.org/10.1016/j.indmarman.2019.02.013>
- Hardwick, J., Anderson, A. R., & Cruickshank, D. (2013). Trust formation processes in innovative collaborations. *European Journal of Innovation Management*, 16(1), 4–21. <https://doi.org/10.1108/14601061311292832>
- Harmeling, C. M., Moffett, J. W., Arnold, M. J., & Carlson, B. D. (2017). Toward a theory of customer engagement marketing. *Journal of the Academy of Marketing Science*, 45(3), 312–335. <https://doi.org/10.1007/s11747-016-0509-2>
- Harper, D. (2002). Talking about pictures: A case for photo elicitation. *Visual Studies*, 17(1), 13–26. <https://doi.org/10.1080/14725860220137345>
- Harrison, B., Kelley, M. R., & Gant, J. (1996). Innovative firm behavior and local milieu: Exploring the intersection of agglomeration, firm effects, and technological change. *Economic Geography*, 72(3), 233–258. <https://doi.org/144400>
- Hartley, J. (2006). *Innovation and its contribution to improvement: A review for policymakers, policy advisers, managers and researchers*. Department for Communities and Local Government. <https://www.scie-socialcareonline.org.uk/innovation-and-its-contribution-to-improvement-a-review-for-policy-makers-policy-advisers-managers-and-researchers/r/a11G00000017ytdIAA>
- Haß, H.-J. (1983). *Die Messung des technischen Fortschritts: Theoretische und komparativ-empirische Analyse für ausgewählte Wirtschaftsbereiche der Bundesrepublik Deutschland und Schwedens im Zeitraum 1950 - 1978* [Doctoral dissertation, Christian-Albrechts-Universität zu Kiel]. Florentz.
- Hassi, L., & Rekonen, S. (2018). How individual characteristics promote experimentation in innovation. *International Journal of Innovation Management*, 22(4), Article 1850038. <https://doi.org/10.1142/S136391961850038X>
- Hauschildt, J., & Gemünden, H. G. (Eds.). (1998). *Promotoren: Champions der Innovation*. Springer Gabler. <https://doi.org/10.1007/978-3-663-13110-6>
- Hauschildt, J., & Keim, G. (1999). Projektleiter als Prozeßpromotoren. In J. Hauschildt, & H. G. Gemünden (Eds.), *Promotoren: Champions der Innovation* (2nd ed., pp. 211–231). Springer Gabler.
- Hauschildt, J., & Salomo, S. (2007). *Innovationsmanagement* (4th rev. ed.). Vahlen.

- Healy, M., & Perry, C. (2000). Comprehensive criteria to judge validity and reliability of qualitative research within the realism paradigm. *Qualitative Market Research: An International Journal*, 3(3), 118–126. <https://doi.org/10.1108/13522750010333861>
- Heikkilä, J., & Heikkilä, M. (2017, June 18). *Innovation in micro, small and medium sized enterprises: New product development, business model innovation and effectuation* [Conference Paper]. 30th Bled eConference, Bled, Slovenia.
- Heikkilä, M., Bouwman, H., & Heikkilä, J. (2018). From strategic goals to business model innovation paths: An exploratory study. *Journal of Small Business and Enterprise Development*, 25(1), 107–128. <https://doi.org/10.1108/JSBED-03-2017-0097>
- Heikkinen, M. T., Mainela, T., Still, J., & Tähtinen, J. (2007). Roles for managing in mobile service development nets. *Industrial Marketing Management*, 36(7), 909–925. <https://doi.org/10.1016/j.indmarman.2007.05.014>
- Heinonen, K. (2018). Positive and negative valence influencing consumer engagement. *Journal of Service Theory and Practice*, 28(2), 147–169. <https://doi.org/10.1108/JSTP-02-2016-0020>
- Heitmann, M., Knyphausen-Aufsess, D. zu, Mansel, R., & Zaby, A. (2011). Auf der Suche nach Einflussfaktoren auf die Wahl des Geschäftsmodells – Das Beispiel der Biotech-Industrie. In T. Bieger, D. zu Knyphausen-Aufseß, & C. Krys (Eds.), *Innovative Geschäftsmodelle* (pp. 229–248). Springer-Verlag. https://doi.org/10.1007/978-3-642-18068-2_12
- Hering, D., & Phillips, J. (2005). *Innovation roles: The people you need for successful innovation*. NetCentrics Corporation.
- Herrmann, A., Tomczak, T., & Befurt, R. (2006). Determinants of radical product innovations. *European Journal of Innovation Management*, 9(1), 20–43. <https://doi.org/10.1108/1461060610640005>
- Hogg, M. A., Terry, D. J., & White, K. M. (1995). A tale of two theories: A critical comparison of identity theory with social identity theory. *Social Psychology Quarterly*, 58(4), 255. <https://doi.org/10.2307/2787127>
- Hollebeek, L. D. (2011). Demystifying customer brand engagement: Exploring the loyalty nexus. *Journal of Marketing Management*, 27(7/8), 785–807. <https://doi.org/10.1080/0267257X.2010.500132>
- Hollebeek, L. D., & Chen, T. (2014). Exploring positively- versus negatively-valenced brand engagement: A conceptual model. *Journal of Product & Brand Management*, 23(1), 62–74. <https://doi.org/10.1108/JPBM-06-2013-0332>
- Hollebeek, L. D., Conduit, J., & Brodie, R. J. (2016). Strategic drivers, anticipated and unanticipated outcomes of customer engagement. *Journal of Marketing Management*, 32(5-6), 393–398. <https://doi.org/10.1080/0267257X.2016.1144360>
- Hollebeek, L. D., Srivastava, R. K., & Chen, T. (2019). S-D logic-informed customer engagement: Integrative framework, revised fundamental propositions, and application to CRM. *Journal of the Academy of Marketing Science*, 47(1), 161–185. <https://doi.org/10.1007/s11747-016-0494-5>

- Homburg, C. (2017). *Marketingmanagement: Strategie - Instrumente - Umsetzung - Unternehmensführung* (6th ed.). Springer Gabler. <https://doi.org/10.1007/978-3-658-13656-7>
- Homburg, C. (2020). *Grundlagen des Marketingmanagements* (6th rev. and ext. ed.). Springer Gabler. <https://doi.org/10.1007/978-3-658-29638-4>
- Hoogma, R., Kemp, R., Schot, J., & Truffer, B. (2002). *Experimenting for sustainable transport: The approach of strategic niche management*. Routledge. <https://doi.org/10.4324/9780203994061>
- Hopf, C. (2010). Qualitative Interviews – ein Überblick. In U. Flick, E. von Kardorff, & I. Steinke (Eds.), *Qualitative Forschung: Ein Handbuch* (8th ed., pp. 349–360). Reinbek.
- Hossain, M. (2017). Business model innovation: Past research, current debates, and future directions. *Journal of Strategy and Management*, 10(3), 342–359. <https://doi.org/10.1108/JSMA-01-2016-0002>
- Howell, J. M. (2005). The right stuff: Identifying and developing effective champions of innovation. *Academy of Management Perspectives*, 19(2), 108–119. <https://doi.org/10.5465/ame.2005.16965104>
- Howell, J. M., & Higgins, C. A. (1990a). Champions of change: Identifying, understanding, and supporting champions of technological innovations. *Organizational Dynamics*, 19(1), 40–55. [https://doi.org/10.1016/0090-2616\(90\)90047-S](https://doi.org/10.1016/0090-2616(90)90047-S)
- Howell, J. M., & Higgins, C. A. (1990b). Champions of technological innovation. *Administrative Science Quarterly*, 35(2), 317–341. <https://doi.org/10.2307/2393393>
- Howell, J. M., & Shea, C. M. (2001). Individual differences, environmental scanning, innovation framing, and champion behavior: Key predictors of project performance. *Journal of Product Innovation Management*, 18(1), 15–27. <https://doi.org/10.1111/1540-5885.1810015>
- Hoyer, W. D., Chandy, R., Dorotic, M., Krafft, M., & Singh, S. S. (2010). Consumer cocreation in new product development. *Journal of Service Research*, 13(3), 283–296. <https://doi.org/10.1177/1094670510375604>
- Huber, M., & Kleinaltenkamp, M. (2018). Changes of organizational usage processes: Attitudes, behaviours and consequences. *Marketing ZFP*, 40(3), 17–30. <https://doi.org/10.15358/0344-1369-2018-3-17>
- Humble, J., & Jones, G. (1989). Creating a climate for innovation. *Long Range Planning*, 22(4), 46–51. [https://doi.org/10.1016/0024-6301\(89\)90081-2](https://doi.org/10.1016/0024-6301(89)90081-2)
- Hunt, S. D. (2000). The competence-based, resource-advantage, and neoclassical theories of competition: Toward a synthesis. In R. Sanchez, & A. Heene (Eds.), *Competence-based strategic management: Theory and research* (pp. 177–208). JAI Press.
- Hurley, P. J. (2000). *A concise introduction to logic* (7th ed.). Wadsworth Thomson Learning.
- Ingnas, M., Harder, M., & Marxt, C. (2007). Measuring the science-to-market gap: The case of new energy technologies. *International Journal of Innovation and Technology Management*, 4(4), 457–478. <https://doi.org/10.1142/S0219877007001181>

- Jaakkola, E., & Alexander, M. J. (2014). The role of customer engagement behavior in value co-creation. *Journal of Service Research, 17*(3), 247–261. <https://doi.org/10.1177/1094670514529187>
- Jansen, S. A., & Mast, C. (2014). Konvergente Geschäftsmodellinnovationen in Deutschland: Studienergebnisse zu Treibern, Hemmnissen und Erfolgsfaktoren. *Zeitschrift Führung + Organisation, 83*(1), 25–31.
- Joas, H. (1978). *Die gegenwärtige Lage der soziologischen Rollentheorie* (3rd ed.). Akademische Verlagsanstalt.
- Johne, F. A., & Snelson, P. A. (1988). Success factors in product innovation: A selective review of the literature. *Journal of Product Innovation Management, 5*(2), 114–128. <https://doi.org/10.1111/1540-5885.520114>
- Johnson, M. W., Clayton, C. M., & Kagermann, H. (2008). Reinventing your business model. *Harvard Business Review, 86*(12), 51–59.
- Johnson, M. W., & Lafley, A. G. (2010). *Seizing the white space: Business model innovation for growth and renewal*. Harvard Business Press.
- Jonas, J. M., Boha, J., Sörhammar, D., & Moeslein, K. M. (2018). Stakeholder engagement in intra- and inter-organizational innovation. *Journal of Service Management, 29*(3), 399–421. <https://doi.org/10.1108/JOSM-09-2016-0239>
- Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal, 33*(4), 692–724. <https://doi.org/10.5465/256287>
- Katz, D., & Kahn, R. L. (1966). *The social psychology of organizations*. John Wiley & Sons.
- Katz, M. L., & Shapiro, C. (1985). Network externalities, competition, and compatibility. *American Economic Review, 75*(3), 424–440.
- Kaya, M. (2009). Verfahren der Datenerhebung. In S. Albers, D. Klapper, U. Konradt, A. Walter, & J. Wolf (Eds.), *Methodik der empirischen Forschung* (3rd ed., pp. 49–64). Springer Gabler. https://doi.org/10.1007/978-3-322-96406-9_4
- Kelle, U. (2004). Computer-assisted analysis of qualitative data. In U. Flick, E. von Kardoff, & I. Steinke (Eds.), *A Companion to qualitative research* (pp. 276–283). Sage Publications. <https://doi.org/10.1093/oxfordhb/9780199811755.013.007>
- Kerr, W. R., Nanda, R., & Rhodes-Kropf, M. (2014). Entrepreneurship as experimentation. *Journal of Economic Perspectives, 28*(3), 25–48. <https://doi.org/10.1257/jep.28.3.25>
- Kim, C. W., & Mauborgne, R. (2005). *Blue ocean strategy: How to create uncontested market space and make the competition irrelevant*. Harvard Business School Press.
- Kim, S. K., & Min, S. (2015). Business model innovation performance: When does adding a new business model benefit an incumbent? *Strategic Entrepreneurship Journal, 9*(1), 34–57. <https://doi.org/10.1002/sej.1193>
- Kleinaltenkamp, M., Karpen, I. O., Plewa, C., Jaakkola, E., & Conduit, J. (2019). Collective engagement in organizational settings. *Industrial Marketing Management, 80*, 11–23. <https://doi.org/10.1016/j.indmarman.2019.02.009>

- Klößner, J., & Friedrichs, J. (2014). Gesamtgestaltung des Fragebogens. In N. Baur, & J. Blasius (Eds.), *Handbuch Methoden der empirischen Sozialforschung* (pp. 675–685). Springer-Verlag. https://doi.org/10.1007/978-3-531-18939-0_49
- Knowles, E. S. (1982). From individuals to group members: A dialectic for the social sciences. In W. Ickes, & E. S. Knowles (Eds.), *Personality, Roles, and Social Behavior* (pp. 1–32). Springer-Verlag.
- Kollmann, T., Stöckmann, C., Hensellek, S., & Kensbock, J. (2016). *European Startup Monitor 2016*. Universität Duisburg-Essen Lehrstuhl für E-Business.
- Korpysa, J. (2021). Process ambidexterity in startups innovation. *Management Systems in Production Engineering*, 29(1), 27–32. <https://doi.org/10.2478/mspe-2021-0004>
- Kozlenkova, I. V., Samaha, S. A., & Palmatier, R. W. (2014). Resource-based theory in marketing. *Journal of the Academy of Marketing Science*, 42(1), 1–21. <https://doi.org/10.1007/s11747-013-0336-7>
- Krotz, F. (2008). Interaktion als Perspektivverschränkung: Ein Beitrag zum Verständnis von Rolle und Identität in der Theorie des Psychodrama. In S. Gunkel (Ed.), *Psychodrama und Soziometrie* (pp. 27–50). Springer VS. https://doi.org/10.1007/978-3-531-92044-3_2
- Kumar, V., Aksoy, L., Donkers, B., Venkatesan, R., Wiesel, T., & Tillmanns, S. (2010). Undervalued or overvalued customers: Capturing total customer engagement value. *Journal of Service Research*, 13(3), 297–310. <https://doi.org/10.1177/1094670510375602>
- Kumar, V., & Pansari, A. (2016). Competitive advantage through engagement. *Journal of Marketing Research*, 53(4), 497–514. <https://doi.org/10.1509/jmr.15.0044>
- 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. <https://doi.org/10.1016/j.ejm.2012.07.007>
- Langley, A. (1999). Strategies for theorizing from process data. *Academy of Management Review*, 24(4), 691–710. <https://doi.org/10.5465/amr.1999.2553248>
- Laudien, S. M., & Daxböck, B. (2016). Path dependence as a barrier to business model change in manufacturing firms: Insights from a multiple-case study. *Journal of Business Economics*, 86(6), 611–645. <https://doi.org/10.1007/s11573-015-0793-1>
- Lee, Y., Shin, J., & Park, Y. (2012). The changing pattern of SME's innovativeness through business model globalization. *Technological Forecasting and Social Change*, 79(5), 832–842. <https://doi.org/10.1016/j.techfore.2011.10.008>
- 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(6), 1025–1038. <https://doi.org/10.1016/j.respol.2014.02.001>
- Leminen, S. (2015). *Living labs as open innovation networks: Networks, roles and innovation outcomes* [Doctoral dissertation, Aalto University]. Aalto University publication series.
- Leutz, G. (1974). *Psychodrama: Theorie und Praxis. Das klassische Psychodrama nach J. L. Moreno*. Springer-Verlag.

- Li, L. P., Juric, B., & Brodie, R. J. (2017). Dynamic multi-actor engagement in networks: The case of United Breaks Guitars. *Journal of Service Theory and Practice*, 27(4), 738–760. <https://doi.org/10.1108/JSTP-04-2016-0066>
- Libai, B., Bolton, R., Bügel, M. S., de Ruyter, K., Götz, O., Risselada, H., & Stephen, A. T. (2010). Customer-to-customer interactions: Broadening the scope of word of mouth research. *Journal of Service Research*, 13(3), 267–282. <https://doi.org/10.1177/1094670510375600>
- Linder, J. C., & Cantrell, S. (2000). *Changing business models: Surveying the landscape* (Working Paper). Accenture Institute for Strategic Change.
- Lindgardt, Z., Reeves, M., Stalk, G., & Deimler, M. S. (2013). Business model innovation: When the game gets tough, change the game. In M. Deimler, R. Lesser, D. Rhodes, & J. Sinha (Eds.), *Own the future: 50 ways to win from the Boston Consulting Group* (pp. 291–298). John Wiley & Sons. <https://doi.org/10.1002/9781119204084.ch40>
- Lindgren, P., Taran, Y., & Boer, H. (2010). From single firm to network-based business model innovation. *International Journal of Entrepreneurship and Innovation Management*, 12(2), 122–137. <https://doi.org/10.1504/IJEIM.2010.034417>
- Lindholm-Dahlstrand, Å., Andersson, M., & Carlsson, B. (2019). Entrepreneurial experimentation: A key function in systems of innovation. *Small Business Economics*, 53(3), 591–610. <https://doi.org/10.1007/s11187-018-0072-y>
- Linnarson, H. (2005). Patterns of alignment in alliance structure and innovation. *Technology Analysis & Strategic Management*, 17(2), 161–181. <https://doi.org/10.1080/09537320500088781>
- Linton, R. (1936). *The study of man*. Appleton-Century-Crofts.
- Linton, R. (1947). *The cultural background of personality*. Routledge.
- Liu, W., Sidhu, A., Beacom, A. M., & Valente, T. W. (2017). *Social network theory*. John Wiley & Sons. <https://doi.org/10.1002/9781118783764.wbieme0092>
- London, T., & Hart, S. L. (2004). Reinventing strategies for emerging markets: Beyond the transnational model. *Journal of International Business Studies*, 35(5), 350–370. <https://doi.org/10.1057/palgrave.jibs.8400099>
- Loureiro, S. M. C., Romero, J., & Bilro, R. G. (2020). Stakeholder engagement in co-creation processes for innovation: A systematic literature review and case study. *Journal of Business Research*, 119(C), 388–409. <https://doi.org/10.1016/j.jbusres.2019.09.038>
- Lubik, S., & Garnsey, E. (2016). Early business model evolution in science-based ventures: The case of advanced materials. *Long Range Planning*, 49(3), 393–408. <https://doi.org/10.1016/j.lrp.2015.03.001>
- Lusch, R. F., & Vargo, S. L. (2014a). *An introduction to service-dominant logic*. Cambridge University Press.
- Lusch, R. F., & Vargo, S. L. (2014b). *The service-dominant logic of marketing: Dialog, debate, and directions*. Routledge. <https://doi.org/10.4324/9781315699035>
- Lusch, R. F., & Vargo, S. L. (2014c). *Service-dominant logic: Premises, perspectives, possibilities*. Cambridge University Press.

- Madhavaram, S., & Hunt, S. D. (2008). The service-dominant logic and a hierarchy of operant resources: Developing masterful operant resources and implications for marketing strategy. *Journal of the Academy of Marketing Science*, 36(1), 67–82. <https://doi.org/10.1007/s11747-007-0063-z>
- Madhok, A., & Tallman, S. B. (1998). Resources, transactions and rents: Managing value through interfirm collaborative relationships. *Organization Science*, 9(3), 326–339. <https://doi.org/10.1287/orsc.9.3.326>
- Magerhans, A. (2016). *Marktforschung: Eine Praxisorientierte Einführung*. Springer Gabler. <https://doi.org/10.1007/978-3-658-00891-8>
- Magretta, J. (2002). Why business models matter. *Harvard Business Review*, 80(5), 86–92.
- Manning, K., Birley, S., & Norburn, D. (1989). Developing a new ventures strategy. *Entrepreneurship Theory and Practice*, 14(1), 67–76. <https://doi.org/10.1177/104225878901400106>
- Mansfeld, M. N. (2011). Begriffliche Grundlagen: Innovationsmanagement und Rollenkonzepte. In M. N. Mansfeld (Ed.), *Innovatoren* (pp. 13–41). Springer Gabler. <https://doi.org/10.1007/978-3-8349-6591-2>
- Mansoori, Y., & Lackéus, M. (2019). Comparing effectuation to discovery-driven planning, prescriptive entrepreneurship, business planning, lean startup, and design thinking. *Small Business Economics*, 54(3), 791–818. <https://doi.org/10.1007/s11187-019-00153-w>
- Mantere, S., & Ketokivi, M. (2013). Reasoning in organization science. *Academy of Management Review*, 38(1), 70–89. <https://doi.org/10.5465/amr.2011.0188>
- Marcos-Cuevas, J., Nätti, S., Palo, T., & Baumann, J. (2016). Value co-creation practices and capabilities: Sustained purposeful engagement across B2B systems. *Industrial Marketing Management*, 56, 97–107. <https://doi.org/10.1016/j.indmarman.2016.03.012>
- Margiono, A., Zolin, R., & Chang, A. (2018). A typology of social venture business model configurations. *International Journal of Entrepreneurial Behavior & Research*, 24(3), 626–650. <https://doi.org/10.1108/IJEBr-09-2016-0316>
- Markham, S. K., & Griffin, A. (1998). The breakfast of champions: Associations between champions and product development environments, practices and performance. *Journal of Product Innovation Management*, 15(5), 436–454. <https://doi.org/10.1111/1540-5885.1550436>
- Markham, S. K., Ward, S. J., Aiman-Smith, L., & Kingon, A. I. (2010). The valley of death as context for role theory in product innovation. *Journal of Product Innovation Management*, 27(3), 402–417. <https://doi.org/10.1111/j.1540-5885.2010.00724.x>
- Markides, C. C. (2006). Disruptive innovation: In need of better theory. *Journal of Product Innovation Management*, 23(1), 19–25. <https://doi.org/10.1111/j.1540-5885.2005.00177.x>
- Markides, C. C. (2008). *Game-changing strategies: How to create new market space in established industries by breaking the rules*. John Wiley & Sons. <https://doi.org/10.5860/choice.46-1587>
- Markides, C. C., & Charitou, C. D. (2004). Competing with dual business models: A contingency approach. *Academy of Management Perspectives*, 18(3), 22–36. <https://doi.org/10.5465/ame.2004.14776164>

- 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. <https://doi.org/10.1002/sej.1191>
- Maslowska, E., Malthouse, E. C., & Collinger, T. (2016). The customer engagement ecosystem. *Journal of Marketing Management*, 32(5/6), 469–501. <https://doi.org/10.1080/0267257X.2015.1134628>
- Mason, J. (2002). *Qualitative researching* (2nd ed.). Sage Publications.
- Mason, K., & Spring, M. (2011). The sites and practices of business models. *Industrial Marketing Management*, 40(6), 1032–1041. <https://doi.org/10.1016/j.indmarman.2011.06.032>
- Massa, L., & Tucci, C. L. (2013). Business model innovation. In M. Dodgson, D. Gann, & N. Phillips (Eds.), *The Oxford handbook of innovation management* (pp. 420–441). Oxford University Press.
- Massa, L., Tucci, C. L., & Afuah, A. (2017). A critical assessment of business model research. *The Academy of Management Annals*, 11(1), 73–104. <https://doi.org/10.5465/annals.2014.0072>
- Mayerhofer, W. (2009). Das Fokusgruppeninterview. In R. Buber, & H. H. Holzmüller (Eds.), *Qualitative Marktforschung: Konzepte – Methoden – Analysen* (2nd ed., pp. 477–490). Springer Gabler. <https://doi.org/10.1007/978-3-8349-9441-7>
- Mayring, P. (1991). Qualitative Inhaltsanalyse. In U. Flick (Ed.), *Handbuch qualitative Sozialforschung: Grundlagen, Konzepte, Methoden und Anwendungen* (pp. 209–213). Psychologie-Verlag-Union.
- Mayring, P. (2000). Qualitative Content Analysis. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 1(2), Article 20. <https://doi.org/10.17169/fqs-1.2.1089>
- Mayring, P. (2015). *Qualitative Inhaltsanalyse: Grundlagen und Techniken* (12th rev. ed.). Beltz.
- Mayring, P., & Brunner, E. (2009). Qualitative Inhaltsanalyse. In R. Buber, & H. H. Holzmüller (Eds.), *Qualitative Marktforschung: Konzepte - Methoden - Analysen* (2nd ed., pp. 669–680). Springer Gabler. <https://doi.org/10.1007/978-3-8349-9441-7>
- Mayring, P., & Fenzl, T. (2014). Qualitative Inhaltsanalyse. In N. Baur & J. Blasius (Eds.), *Handbuch Methoden der empirischen Sozialforschung* (pp. 543–556). Springer VS. https://doi.org/10.1007/978-3-531-18939-0_1
- McDonald, R. M., & Eisenhardt, K. M. (2020). Parallel lay: Startups, nascent markets, and effective business-model design. *Administrative Science Quarterly*, 65(2), 483–523. <https://doi.org/10.1177/0001839219852349>
- McGrath, H., Medlin, C. J., & O'Toole, T. (2019). A process-based model of network capability development by a start-up firm. *Industrial Marketing Management*, 80, 214–227. <https://doi.org/10.1016/j.indmarman.2017.11.011>
- McGrath, R. G. (2010). Business models: A discovery driven approach. *Long Range Planning*, 43(2/3), 247–261. <https://doi.org/10.1016/j.lrp.2009.07.005>
- McGrath, R. G., & MacMillan, I. C. (1995). Discovery-driven planning. *Long Range Planning*, 28(5), 128. [https://doi.org/10.1016/0024-6301\(95\)90324-0](https://doi.org/10.1016/0024-6301(95)90324-0)

- McGrath, R. G., & MacMillan, I. C. (2000). *The entrepreneurial mindset: Strategies for continuously creating opportunity in an age of uncertainty*. Harvard Business Press.
- Mead, G. H. (1934). *Mind, self and society*. University of Chicago Press.
- Meffert, H. (1986). *Marktforschung: Grundriß mit Fallstudien*. Springer Gabler. <https://doi.org/10.1007/978-3-322-85903-7>
- Meoli, M., & Vismara, S. (2016). University support and the creation of technology and non-technology academic spin-offs. *Small Business Economics*, 47(2), 345–362. <https://doi.org/10.1007/s11187-016-9721-1>
- Merriam-Webster (n.d.). Engaged. In *Merriam-Webster.com dictionary*. Retrieved March 14, 2022, from <https://www.merriam-webster.com/dictionary/engaged>
- Merriam-Webster (n.d.). Engaging. In *Merriam-Webster.com dictionary*. Retrieved March 14, 2022, from <https://www.merriam-webster.com/dictionary/engaging>
- Merriam-Webster (n.d.). Engage. In *Merriam-Webster.com dictionary*. Retrieved March 14, 2022, from <https://www.merriam-webster.com/dictionary/engage>
- Merton, R. K. (1957). The role set: Problems in sociological theory. *British Journal of Sociology*, 8(2), 106–120. <https://doi.org/587363>
- Metzger, G. (2020). *KfW-Start-up-Report 2020*. https://www.kfw.de/%C3%9Cber-die-KfW/Newsroom/Aktuelles/News-Details_610176.html
- Meyer, M. (2000). Innovation roles: From souls of fire to devil's advocates. *Journal of Business Communication*, 37(4), 328–347. <https://doi.org/10.1177/002194360003700401>
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Sage Publications.
- Miles, R. E., Miles, G., & Snow, C. C. (2006). Collaborative entrepreneurship. *Organizational Dynamics*, 35(1), 1–11. <https://doi.org/10.1016/j.orgdyn.2005.12.004>
- Minder, S. (2001). *Wissensmanagement in KMU: Beitrag zur Ideengenerierung im Innovationsprozess* [Doctoral dissertation, St. Gallen Universität]. Gemeinsamer Bibliotheksverbund.
- Minniti, M., & Bygrave, W. (2001). A dynamic model of entrepreneurial learning. *Entrepreneurship Theory and Practice*, 25(3), 5–16. <https://doi.org/10.1177/104225870102500301>
- Mitchell, D. W., & Coles, C. B. (2003). The ultimate competitive advantage of continuing business model innovation. *Journal of Business Strategy*, 24(5), 15–21. <https://doi.org/10.1108/02756660310504924>
- Mitchell, D. W., & Coles, C. B. (2004). Business model innovation breakthrough moves. *Journal of Business Strategy*, 25(1), 16–26. <https://doi.org/10.1108/02756660410515976>
- Moeller, S., Ciuchita, R., Mahr, D., Odekerken-Schröder, G., & Fassnacht, M. (2013). Uncovering collaborative value creation patterns and establishing corresponding customer roles. *Journal of Service Research*, 16(4), 471–487. <https://doi.org/10.1177/1094670513480851>

- Molina-Castillo, F.-J., Munuera-Alemán, J.-L., & Calantone, R. J. (2011). Product quality and new product performance: The role of network externalities and switching costs. *Journal of Product Innovation Management*, 28(6), 915–929. <https://doi.org/10.1111/j.1540-5885.2011.00847.x>
- Montgomery, D. C., Peck, E. A., & Vining, G. G. (2021). *Introduction to linear regression analysis* (6th ed.). John Wiley & Sons.
- Mora-Valentin, E. M., Montoro-Sanchez, A., & Guerras-Martin, L. A. (2004). Determining factors in the success of R&D cooperative agreements between firms and research organizations. *Research Policy*, 33(1), 17–40. [https://doi.org/10.1016/S0048-7333\(03\)00087-8](https://doi.org/10.1016/S0048-7333(03)00087-8)
- Moreno, J. L. (1934). *Who shall survive? A new approach to the problem of human interrelations*. Beacon House.
- Moreno, J. L. (1940). Psychodramatic treatment of marriage problems. *Sociometry* 3(1), 1–23.
- Moreno, J. L. (1946). *Psychodrama, first volume*. Beacon House.
- Morris, M., Schindehutte, M., & Allen, J. (2005). The entrepreneur's business model: Toward a unified perspective. *Journal of Business Research*, 58(6), 726–735. <https://doi.org/10.1016/j.jbusres.2003.11.001>
- Mosteller, J., & Mathwick, C. (2014). Reviewer online engagement: The role of rank, well-being, and market helping behavior. *Journal of Consumer Marketing*, 31(6/7), 464–474. <https://doi.org/10.1108/JCM-05-2014-0974>
- Moustakas, C. (1994). *Phenomenological research methods*. Sage Publications. <https://dx.doi.org/10.4135/9781412995658>
- Müller, S. D., Páske, N., & Rodil, L. (2019). Managing ambidexterity in startups pursuing digital innovation. *Communications of the Association for Information Systems*, 44(1), 273–298. <https://doi.org/10.17705/1CAIS.04418>
- Müller-Roterberg, C. (2020). Entwicklung von Geschäftsmodell-Innovationen. In R. Tiwari, & S. Buse (Eds.), *Managing Innovation in a Global and Digital World* (pp. 63–81). Springer Gabler. <https://doi.org/10.1007/978-3-658-27241-8>
- Müller-Stewens, G., & Lechner, C. (2005). *Strategisches Management: Wie strategische Initiativen zum Wandel führen* (3rd ed.). Schäffer-Poeschel.
- Murray, F., & Tripsas, M. (2004). The exploratory processes of entrepreneurial firms: The role of purposeful experimentation. *Advances in Strategic Management*, 21, 45–75. [https://doi.org/10.1016/S0742-3322\(04\)21002-6](https://doi.org/10.1016/S0742-3322(04)21002-6)
- Mustar, P., Wright, M., & Clarysse, B. (2008). University spin-off firms: Lessons from ten years of experience in Europe. *Science and Public Policy*, 35(2), 67–80. <https://doi.org/10.3152/030234208X282862>
- Mütterlein, J., & Kunz, R. E. (2017). Innovate alone or with others? Influence of entrepreneurial orientation and alliance orientation on media business model innovation. *Journal of Media Business Studies*, 14(3), 173–187. <https://doi.org/10.1080/16522354.2018.1445162>

- Najmaei, A. (2016). How do entrepreneurs develop business models in small high-tech ventures? An exploratory model from Australian IT firms. *Entrepreneurship Research Journal*, 6(3), 297–343. <https://doi.org/10.1515/erj-2014-0037>
- Nambisan, S., & Baron, R. A. (2009). Virtual customer environments: Testing a model of voluntary participation in Value co-creation activities. *Journal of Product Innovation Management*, 26(4), 388–406. <https://doi.org/10.1111/j.1540-5885.2009.00667.x>
- Ng, S. C., Sweeney, J. C., & Plewa, C. (2020). Customer engagement: A systematic review and future research priorities. *Australasian Marketing Journal*, 28(4), 235–252. <https://doi.org/10.1016/j.ausmj.2020.05.004>
- Nicholls-Nixon, C. L., Cooper, Arnold, C., & Woo, C. Y. (2000). Strategic experimentation: Understanding change and performance in new ventures. *Journal of Business Venturing*, 15(5/6), 493–521. [https://doi.org/10.1016/S0883-9026\(98\)00018-4](https://doi.org/10.1016/S0883-9026(98)00018-4)
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1), 14–37. <https://doi.org/10.1287/orsc.5.1.14>
- Nyström, A.-G., Leminen, S., Westerlund, M., & Kortelainen, M. (2014). Actor roles and role patterns influencing innovation in living labs. *Industrial Marketing Management*, 43(3), 483–495. <https://doi.org/10.1016/j.indmarman.2013.12.016>
- Nyström, A.-G., & Mustonen, M. (2017). The dynamic approach to business models. *AMS Review*, 7(3/4), 123–137. <https://doi.org/10.1007/s13162-017-0103-x>
- O'Reilly, C. A., & Tushman, M. L. (2008). Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. *Research in Organizational Behavior*, 28, 185–206. <https://doi.org/10.1016/j.riob.2008.06.002>
- Öberg, C. (2010). Customer roles in innovation. *International Journal of Innovation Management*, 14(6), 989–1011. <https://doi.org/10.1142/S1363919610002970>
- Osiyevskyy, O., & Dewald, J. (2015). Explorative versus exploitative business model change: The cognitive antecedents of firm-level responses to disruptive innovation. *Strategic Entrepreneurship Journal*, 9(1), 58–78. <https://doi.org/10.1002/sej.1192>
- Osterwalder, A. (2004). *The business model ontology: A proposition in a design science approach* [Doctoral dissertation, University of Lausanne]. DataCite.
- Osterwalder, A., & Pigneur, Y. (2004). An ontology for e-business models. In W. Currie (Ed.), *Value creation from e-business models* (pp. 65–97). Butterworth-Heinemann.
- Osterwalder, A., Pigneur, Y., & Clark, T. (2010). *Business model generation: A handbook for visionaries, game changers, and challengers*. John Wiley & Sons.
- 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), 1–38. <https://doi.org/10.17705/1cais.01601>
- Pansari, A., & Kumar, V. (2017). Customer engagement: The construct, antecedents, and consequences. *Journal of the Academy of Marketing Science*, 45(3), 294–311. <https://doi.org/10.1007/s11747-016-0485-6>
- Parsons, T. (1937). *The structure of social action*. The Free Press.
- Parsons, T. (1951). *The social system*. The Free Press.

- 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. <https://doi.org/10.1108/09534810510589589>
- Patterson, M. L., Markey, M. A., & Somers, J. M. (2012). Multiple paths to just ends: Using narrative interviews and timelines to explore health equity and homelessness. *International Journal of Qualitative Methods*, 11(2), 132–151. <https://doi.org/10.1177%2F160940691201100202>
- Patton, M. Q. (1989). *Qualitative evaluation methods*. Sage Publications.
- Patzelt, H., Knyphausen-Aufseß, D. zu, & Nikol, P. (2008). Top management teams, business models, and performance of biotechnology ventures: An upper echelon perspective. *British Journal of Management*, 19(3), 205–221. <https://doi.org/10.1111/j.1467-8551.2007.00552.x>
- Peirce, C. S., & Buchler, J. (1955). *Philosophical writings of Peirce*. Dover Publications.
- Penrose, E. T. (1959). *The theory of the growth of the firm*. John Wiley & Sons.
- Perillieux, R. (1987). *Der Zeitfaktor im strategischen Technologiemanagement: Früher oder später Einstieg bei technischen Produktinnovationen?* [Doctoral dissertation, Technische Hochschule Darmstadt]. Erich Schmidt Verlag.
- Perry, G., & Bellamy, C. (2012). *Principles of methodology: Research design in social science*. Sage Publications. <https://dx.doi.org/10.4135/9781446288047>
- Pettigrew, A. M. (1992). The character and significance of strategy process research. *Strategic Management Journal*, 13(Special Issue), 5–16. <https://doi.org/10.1002/smj.4250130903>
- Pettigrew, A. M. (1997). What is a processual analysis? *Scandinavian Journal of Management*, 13(4), 337–348. [https://doi.org/10.1016/S0956-5221\(97\)00020-1](https://doi.org/10.1016/S0956-5221(97)00020-1)
- Petzold, H., & Mathias, U. (1982). *Rollenentwicklung und Identität: Von den Anfängen der Rollentheorie zum sozialpsychiatrischen Rollenkonzept Morenos*. Junfermann Verlag.
- Pfisterer, L. (2016). *Wertkreation in Kundennutzungsprozessen* [Doctoral dissertation, Technische Universität Kaiserslautern]. Springer Gabler.
- Phillips, B. J., & McQuarrie, E. F. (2010). Narrative and persuasion in fashion advertising. *Journal of Consumer Research*, 37(3), 368–392. <https://doi.org/10.1086/653087>
- Prahalad, C. K., & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, 68(3), 79–91. https://doi.org/10.1007/3-540-30763-x_14
- Prior, D. D., & Marcos-Cuevas, J. (2016). Value co-destruction in interfirm relationships. *Marketing Theory*, 16(4), 533–552. <https://doi.org/10.1177/1470593116649792>
- Raithel, J. (2008). *Quantitative Forschung*. Springer VS. <https://doi.org/10.1007/978-3-531-91148-9>
- Ramdani, B., Binsaif, A., & Boukrami, E. (2019). Business model innovation: A review and research agenda. *New England Journal of Entrepreneurship*, 22(2), 89–108. <https://doi.org/10.1108/NEJE-06-2019-0030>
- Reichert, J. (2004). Abduction, deduction and induction in qualitative research. In U. Flick, E. von Kardorff, & I. Steinke (Eds.), *A companion to qualitative research* (pp. 159–164). Sage Publications.

- Reinartz, W. J., & Berkmann, M. (2018). From customer to partner engagement: A conceptualization and typology of engagement in B2B. In R. W. Palmatier, V. Kumar, & C. M. Harmeling (Eds.), *Customer engagement marketing* (pp. 243–268). Palgrave Macmillan. https://doi.org/10.1007/978-3-319-61985-9_11
- Reinhold, S., Reuter, E., & Bieger, T. (2011). Innovative Geschäftsmodelle - Die Sicht des Managements. In T. Bieger, D. zu Knyphausen-Aufseß, & C. Krys (Eds.), *Innovative Geschäftsmodelle* (pp. 71–92). Springer-Verlag. <https://doi.org/10.1007/978-3-642-18068-2>
- Rentmeister, J., & Klein, S. (2003). Geschäftsmodelle - ein Modebegriff auf der Waagschale. In H. Albach, & J. Hummel (Eds.), *Die Zukunft des Electronic Business* (pp. 17–30). Springer Gabler. https://doi.org/10.1007/978-3-663-12056-8_2
- Reymen, I., Andries, P., Berends, H., Mauer, R., Stephan, U., & van Burg, E. (2015). Understanding dynamics of strategic decision making in venture creation: A process study of effectuation and causation. *Strategic Entrepreneurship Journal*, 9(4), 351–379. <https://doi.org/10.1002/sej.1201>
- Reymen, I., Berends, H., Oudehand, R., & Stultiens, R. (2017). Decision making for business model development: A process study of effectuation and causation in new technology-based ventures. *R&D Management*, 47(4), <https://doi.org/10.1111/radm.12249>
- Richardson, J. (2008). The business model: An integrative framework for strategy execution. *Strategic Change*, 17(5/6), 133–144. <https://doi.org/10.1002/jsc.821>
- Ries, E. (2011). The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses. *Crown Business*. https://doi.org/10.1111/j.1540-5885.2012.00920_2.x
- Riesmeyer, C. (2011). Das Leitfadentinterview: Königsweg der qualitativen Journalismusforschung? In O. Jandura, T. Quandt, & J. Vogelgesang (Eds.), *Methoden der Journalismusforschung* (pp. 223–236). Springer VS. https://doi.org/10.1007/978-3-531-93131-9_13
- Robertson, T. S. (2017). Business model innovation: A marketing ecosystem view. *AMS Review*, 7(3/4), 90–100. <https://doi.org/10.1007/s13162-017-0101-z>
- Rogers, E. M. (1983). *Diffusion of innovations* (3rd ed.). McMillan Publishing.
- Rosenblatt, P. C., de Mik, L., Anderson, R. M., & Johnson, P. A. (1985). *The family in business: Understanding and dealing with the challenges entrepreneurial families face*. Jossey-Bass.
- Roth, S., Mentges, S., & Robbert, T. (2021). Actor engagement in business model innovation: The role of experimentation in new ventures' business model design. *Marketing ZfP*, 43(4), 35–48.
- Sabatier, V., Craig-Kennard, A., & Mangematin, V. (2012). When technological discontinuities and disruptive business models challenge dominant industry logics: Insights from the drugs industry. *Technological Forecasting and Social Change*, 79(5), 949–962. <https://doi.org/10.1016/j.techfore.2011.12.007>
- Saebi, T., Lien, L., & Foss, N. J. (2017). What drives business model adaptation? The impact of opportunities, threats and strategic orientation. *Long Range Planning*, 50(5), 567–581. <https://doi.org/10.1016/j.lrp.2016.06.006>

- Sampson, S. E., & Spring, M. (2012). Customer roles in service supply chains and opportunities for innovation. *Journal of Supply Chain Management*, 48(4), 30–50. <https://doi.org/10.1111/j.1745-493X.2012.03282.x>
- Santos, J., Spector, B., & van der Heyden, L. (2009). *Toward a theory of business model innovation within incumbent firms* (Working paper No. 16). SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.1362515>
- Sarasvathy, S. D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, 26(2), 243–263. <https://doi.org/10.5465/AMR.2001.4378020>
- Schallmo, D. R. A. (2013). *Geschäftsmodell-Innovation: Grundlagen, bestehende Ansätze, methodisches Vorgehen und B2B-Geschäftsmodelle*. Springer-Verlag.
- Schallmo, D. R. A. (Ed.). (2014a). *Kompendium Geschäftsmodell-Innovation: Grundlagen, aktuelle Ansätze und Fallbeispiele zur erfolgreichen Geschäftsmodell-Innovation*. Springer-Verlag. <https://doi.org/10.1007/978-3-658-04459-6>
- Schallmo, D. R. A. (2014b). Theoretische Grundlagen der Geschäftsmodell-Innovation: Definitionen, Ansätze, Beschreibungsraster und Leitfragen. In D. R. A. Schallmo (Ed.), *Kompendium Geschäftsmodell-Innovation: Grundlagen, aktuelle Ansätze und Fallbeispiele zur erfolgreichen Geschäftsmodell-Innovation* (pp. 1–30). Springer-Verlag. <https://doi.org/10.1007/978-3-658-04459-6>
- Schaltegger, S., & Lüdeke-Freund, F. (2013). Business cases for sustainability. In S. O. Idowu, N. Capaldi, L. Zu, & A. D. Gupta (Eds.), *Encyclopedia of corporate social responsibility* (pp. 245–252). Springer-Verlag. https://doi.org/10.1007/978-3-642-28036-8_744
- Schaufeli, W. B., Salanova, M., González-romá, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness Studies*, 3(1), 71–92. <https://doi.org/10.1023/A:1015630930326>
- Schneider, S., & Spieth, P. (2013). Business model innovation: Towards an integrated future research agenda. *International Journal of Innovation Management*, 17(1), 1–34. <https://doi.org/10.1142/S136391961340001X>
- Schon, D. A. (1963). Champions for radical new inventions. *Harvard Business Review*, 41(2), 77–86. <https://ci.nii.ac.jp/naid/10021355474/>
- Schramm, D. M., & Carstens, J. (2014). Crowdfunding für Startups. In D. M. Schramm, & J. Carstens (Eds.), *Startup-Crowdfunding und Crowdinvesting: Ein Guide für Gründer* (pp. 11–51). Springer Gabler. https://doi.org/10.1007/978-3-658-05926-2_3
- Schumpeter, J. A. (1934). *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle*. Transaction Publishers.
- Schumpeter, J. A. (1939). *Business cycles: A theoretical, historical, and statistical analysis of the capitalist process*. McGraw-Hill Book Company.
- Schwarz, E. J., Krajger, I., & Holzmann, P. (2016). Prozessmodell zur systematischen Geschäftsmodellinnovation. In P. Granig, E. Hartlieb, & D. Lingenhel (Eds.), *Geschäftsmodellinnovationen* (pp. 65–77). Springer Gabler. https://doi.org/10.1007/978-3-658-08623-7_4

- Scott, J. (1991). *Social network analysis: A handbook*. Sage Publications. https://doi.org/10.1007/978-3-642-19460-3_7
- Seddon, P. B., Lewis, G. P., Freeman, P., & Shanks, G. (2004). The case for viewing business models as abstractions of strategy. *Communications of the Association for Information Systems, 13*(1), 427–441. <https://doi.org/10.17705/1cais.01325>
- Seelos, C., & Mair, J. (2007). Profitable business models and market creation in the context of deep poverty: A strategic view. *Academy of Management Perspectives, 21*(4), 49–63. <https://doi.org/10.5465/amp.2007.27895339>
- Shafer, S. M., Smith, H. J., & Linder, J. C. (2005). The power of business models. *Business Horizons, 48*(3), 199–207. <https://doi.org/10.1016/j.bushor.2004.10.014>
- Siggelkow, N. (2002). Evolution toward fit. *Administrative Science Quarterly, 47*(1), 125–159. <https://doi.org/10.2307/3094893>
- Siggelkow, N. (2007). Persuasion with case studies. *Academy of Management Journal, 50*(1), 20–24. <https://doi.org/10.5465/amj.2007.24160882>
- Simon, H. A. (1996). *The sciences of the artificial*. The MIT Press Cambridge.
- Snihur, Y., Reiche, B. S., & Quintane, E. (2017). Sustaining actor engagement during the opportunity development process. *Strategic Entrepreneurship Journal, 11*(1), 1–17. <https://doi.org/10.1002/sej.1233>
- Snihur, Y., & Zott, C. (2014). What leads to business model innovation in new firms? *Academy of Management Proceedings, 2014*(1), Article 10490. <https://doi.org/10.5465/ambpp.2014.10490abstract>
- Snihur, Y., & Zott, C. (2020). The genesis and metamorphosis of novelty imprints: How business model innovation emerges in young ventures. *Academy of Management Journal, 63*(2), 554–583. <https://doi.org/10.5465/amj.2017.0706>
- Sorescu, A., Frambach, R. T., Singh, J., Rangaswamy, A., & Bridges, C. (2011). Innovations in retail business models. *Journal of Retailing, 87*(1), 3–16. <https://doi.org/10.1016/j.jretai.2011.04.005>
- Sosna, M., Trevinyo-Rodríguez, R. N., & Velamuri, S. R. (2010). Business model innovation through trial-and-error learning. *Long Range Planning, 43*(2/3), 383–407. <https://doi.org/10.1016/j.lrp.2010.02.003>
- Spieth, P., & Schneider, S. (2016). Business model innovativeness: Designing a formative measure for business model innovation. *Journal of Business Economics, 86*(6), 671–696. <https://doi.org/10.1007/s11573-015-0794-0>
- Stadler, C., & Kern, S. (2010). *Psychodrama: Eine Einführung*. Springer VS. <https://doi.org/10.1007/978-3-531-92550-9>
- Stake, R. E. (1995). *The art of case study research*. Sage Publications.
- Statista. (2020, August 27). *Branchenübersicht*. <https://de.statista.com/statistik/kategorien/>
- Statista. (2022, March 15). *Durchschnittliche Umsätze junger Unternehmen im Gründungsjahr nach Branchen*. <https://de.statista.com/statistik/daten/studie/12579/umfrage/umsaetze-junger-unternehmen-im-gruendungsjahr/>

- Statistisches Bundesamt. (2020, August 27). *Branchen und Unternehmen*. https://www.destatis.de/DE/Themen/Branchen-Unternehmen/_inhalt.html
- Stewart, D. W., & Zhao, Q. (2000). Internet marketing, business models, and public policy. *Journal of Public Policy & Marketing*, 19(2), 287–296. <https://doi.org/10.1509/jppm.19.2.287.17125>
- Stieglitz, N., & Foss, N. J. (2015). Business model innovation: The role of leadership. In N. J. Foss, & T. Saebi (Eds.), *Business model innovation: The organizational dimension*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780198701873.003.0006>
- Stokes, D., & Bergin, R. (2006). Methodology or “methodolatry”? An evaluation of focus groups and depth interviews. *Qualitative Market Research*, 9(1), 26–37. <https://doi.org/10.1108/13522750610640530>
- Stone-Romero, E. F., Stone, D. L., & Salas, E. (2003). The influence of culture on role conceptions and role behavior in organisations. *Applied Psychology*, 52(3), 328–362. <https://doi.org/10.1111/1464-0597.00139>
- Storbacka, K. (2019). Actor engagement, value creation and market innovation. *Industrial Marketing Management*, 80, 4–10. <https://doi.org/10.1016/j.indmarman.2019.04.007>
- Storbacka, K., Brodie, R. J., Böhmman, T., Maglio, P. P., & Nenonen, S. (2016). Actor engagement as a microfoundation for value co-creation. *Journal of Business Research*, 69(8), 3008–3017. <https://doi.org/10.1016/j.jbusres.2016.02.034>
- Story, V., Hart, S., & O'Malley, L. (2009). Relational resources and competences for radical product innovation. *Journal of Marketing Management*, 25(5/6), 461–481. <https://doi.org/10.1362/026725709X461803>
- Story, V., O'Malley, L., & Hart, S. (2011). Roles, role performance, and radical innovation competences. *Industrial Marketing Management*, 40(6), 952–966. <https://doi.org/10.1016/j.indmarman.2011.06.025>
- Stuart, T. E., & Sorenson, O. (2005). Social networks and entrepreneurship. In S. A. Alvarez (Ed.), *Handbook of entrepreneurship research: Disciplinary Perspectives* (pp. 233–252). Springer-Verlag. https://doi.org/10.1007/0-387-23622-8_11
- Sull, D. N. (2004). Disciplined entrepreneurship. *MIT Sloan Management Review*, 46(1), 71–77. <http://199.38.81.202/data/disciplined%20entrepreneurship.pdf>
- Szmatka, J. (1978). Some remarks about the place of the role theory in the theoretical system of sociology. *The Polish Sociological Bulletin*, (43/44), 67–82.
- Taillard, M., Peters, L. D., Pels, J., & Mele, C. (2016). The role of shared intentions in the emergence of service ecosystems. *Journal of Business Research*, 69(8), 2972–2980. <https://doi.org/10.1016/j.jbusres.2016.02.030>
- Teece, D. J. (2010). Business models, business strategy and innovation. *Long Range Planning*, 43(2/3), 172–194. <https://doi.org/10.1016/j.lrp.2009.07.003>
- Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning*, 51(1), 40–49. <https://doi.org/10.1016/j.lrp.2017.06.007>
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533. [https://doi.org/10.1002/\(SICI\)1097-0266\(199708\)18:7<509::AID-SMJ882>3.0.CO;2-Z](https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z)

- Thomke, S. H. (2003). *Experimentation matters: Unlocking the potential of new technologies for innovation*. Harvard Business School Press.
- Thomke, S. H., von Hippel, E., & Franke, R. (1998). Modes of experimentation: An innovation process—and competitive—variable. *Research Policy*, 27(3), 315–332.
- Timmermans, S., & Tavory, I. (2012). Theory construction in qualitative research. *Sociological Theory*, 30(3), 167–186. <https://doi.org/10.1177/0735275112457914>
- Timmers, P. (1998). Business models for electronic markets. *Electronic Markets*, 8(2), 3–8. <http://dx.doi.org/10.1080/10196789800000016>
- Tolstoy, D., & Agndal, H. (2010). Network resource combinations in the international venturing of small biotech firms. *Technovation*, 30(1), 24–36. <https://doi.org/10.1016/j.technovation.2009.06.004>
- Trainee.de. (2020, August 27). *Branchen*. <https://www.trainee.de/branchen/>
- Trimi, S., & Berbegal-Mirabent, J. (2012). Business model innovation in entrepreneurship. *International Entrepreneurship and Management Journal*, 8(4), 449–465. <https://doi.org/10.1007/s11365-012-0234-3>
- Tripsas, M., & Gavetti, G. (2000). Capabilities, cognition, and inertia: Evidence from digital imaging. *Strategic Management Journal*, 21(10/11), 1147–1161. [https://doi.org/10.1002/1097-0266\(200010/11\)21:10/11<1147::AID-SMJ128>3.0.CO;2-R](https://doi.org/10.1002/1097-0266(200010/11)21:10/11<1147::AID-SMJ128>3.0.CO;2-R)
- Tsai, W., & Ghoshal, S. (1998). Social capital and value creation: The role of intrafirm networks. *Academy of Management Journal*, 41(4), 464–476. <https://doi.org/10.5465/257085>
- Turner, R. H. (1955/56). Role-taking, role-standpoint and reference-group behavior. *American Journal of Sociology*, 61(4), 316–328.
- Turner, R. H. (1962). Role-taking: Process versus conformity. In A. M. Rose (Ed.), *Human behavior and social process: An interactionist approach* (pp. 85–98). Routledge.
- Turner, R. H. (1979). Strategy for developing an integrated role theory. *Humboldt Journal of Social Relations*, 7(1), 123–139.
- Turner, R. H. (2001). Role theory. In J. H. Turner (Ed.), *Handbook of sociological theory* (pp. 233–254). Springer-Verlag. https://doi.org/10.1007/0-387-36274-6_12
- Tushman, M. L., & Katz, R. (1980). External communication and project performance: An investigation into the role of gatekeepers. *Management Science*, 26(11), 1071–1085. <https://doi.org/10.1287/mnsc.26.11.1071>
- Vahs, D., & Brem, A. (2015). *Innovationsmanagement: Von der Idee zur erfolgreichen Vermarktung*. Schäffer-Poeschel.
- Vahs, D., & Burmester, R. (2005). *Innovationsmanagement: Von der Produktidee zur erfolgreichen Vermarktung* (3rd rev. ed.). Schäffer-Poeschel.
- Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing & Health Sciences*, 15(3), 398–405. <https://doi.org/10.1111/nhs.12048>

- van de Ven, A. H. (1992). Suggestions for studying strategy process: A research note. *Strategic Management Journal*, 13(Special Issue), 169–188. <https://doi.org/10.1002/smj.4250131013>
- van de Ven, A. H. (2007). *Engaged scholarship: A guide for organizational and social research*. Oxford University Press.
- van Doorn, J., Lemon, K. N., Mittal, V., Nass, S., Pick, D., Pirner, P., & Verhoef, P. C. (2010). Customer engagement behavior: Theoretical foundations and research directions. *Journal of Service Research*, 13(3), 253–266. <https://doi.org/10.1177/1094670510375599>
- van Maanen, J., Sørensen, J. B., & Mitchell, T. R. (2007). The interplay between theory and method. *Academy of Management Review*, 32(4), 1145–1154. <https://doi.org/10.5465/amr.2007.26586080>
- Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68(1), 1–17. <https://doi.org/10.1509/jmkg.68.1.1.24036>
- Vargo, S. L., & Lusch, R. F. (2008a). From goods to service(s): Divergences and convergences of logics. *Industrial Marketing Management*, 37(3), 254–259. <https://doi.org/10.1016/j.indmarman.2007.07.004>
- Vargo, S. L., & Lusch, R. F. (2008b). Service-dominant logic: Continuing the evolution. *Journal of the Academy of Marketing Science*, 36(1), 1–10. <https://doi.org/10.1007/s11747-007-0069-6>
- Vargo, S. L., & Lusch, R. F. (2011). It's all B2B...and beyond: Toward a systems perspective of the market. *Industrial Marketing Management*, 40(2), 181–187. <https://doi.org/10.1016/j.indmarman.2010.06.026>
- Vargo, S. L., & Lusch, R. F. (2016). Institutions and axioms: An extension and update of service-dominant logic. *Journal of the Academy of Marketing Science*, 44(1), 5–23. <https://doi.org/10.1007/s11747-015-0456-3>
- Verhoef, P. C., Reinartz, W. J., & Krafft, M. (2010). Customer engagement as a new perspective in customer management. *Journal of Service Research*, 13(3), 247–252. <https://doi.org/10.1177/1094670510375461>
- Verleye, K., Gemmel, P., & Rangarajan, D. (2014). Managing engagement behaviors in a network of customers and stakeholders. *Journal of Service Research*, 17(1), 68–84. <https://doi.org/10.1177/1094670513494015>
- Vivek, S. D., Beatty, S. E., Dalela, V., & Morgan, R. M. (2014). A generalized multidimensional scale for measuring customer engagement. *Journal of Marketing Theory and Practice*, 22(4), 401–420. <https://doi.org/10.2753/MTP1069-6679220404>
- Vivek, S. D., Beatty, S. E., & Morgan, R. M. (2012). Customer engagement: Exploring customer relationships beyond purchase. *Journal of Marketing Theory and Practice*, 20(2), 122–146. <https://doi.org/10.2753/MTP1069-6679200201>
- 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. <https://doi.org/10.1080/1469701042000212669>

- Walter, A., & Gemünden, H. G. (2000). Bridging the gap between suppliers and customers through relationship promoters: Theoretical considerations and empirical results. *Journal of Business & Industrial Marketing*, 15(2/3), 86–105. <https://doi.org/10.1108/08858620010316813>
- Webster, F. E., & Wind, Y. (1972). A general model for understanding organizational buying behavior. *Journal of Marketing*, 36(2), 12–19. <https://doi.org/10.2307/1250972>
- Weill, P., & Vitale, M. (2001). *Place to space: Migrating to e-business models*. Harvard Business Press.
- Weill, P., & Woerner, S. L. (2013). Optimizing your digital business model. *MIT Sloan Management Review*, 54(2), 71–78. <https://doi.org/10.1109/emr.2015.7059380>
- Weiner, N., Renner, T., & Kett, H. (2010). *Geschäftsmodelle im „Internet der Dienste“: Aktueller Stand in Forschung und Praxis*. Fraunhofer Verlag.
- Welling, S., Breiter, A., & Schulz, A. H. (2015). *Mediatisierte Organisationswelten in Schulen: Wie der Medienwandel die Kommunikation in den Schulen verändert*. Springer VS. <https://doi.org/10.1007/978-3-658-03677-5>
- Wernerfelt, B. (1995). The resource-based view of the firm: Ten years after. *Strategic Management Journal*, 16(3), 171–174. <https://doi.org/10.1002/smj.4250160303>
- Wilden, R., Akaka, M. A., Karpen, I. O., & Hohberger, J. (2017). The evolution and prospects of service-dominant logic. *Journal of Service Research*, 20(4), 345–361. <https://doi.org/10.1177/1094670517715121>
- Williamson, O. E. (1975). *Markets and hierarchies: Analysis and antitrust implications: A study in the economics of internal organization*. Free Press.
- Winkler, I. (2002). Steuerung von Netzwerken kleiner und mittlerer Unternehmen im Spannungsverhältnis individueller und kollektiver Interessen: Sechs kooperative Netzwerke in Sachsen. In J. Fischer, & S. Gensior (Eds.), *Sprungbrett Region? Strukturen und Voraussetzungen vernetzter Geschäftsbeziehungen* (pp. 253–282). Edition Sigma.
- Wirtschaftsforum. (2020, August 27). *Branchen*. <https://www.wirtschaftsforum.de/branchen>
- Wirtz, B. W. (2000). *Electronic business*. Springer Gabler.
- Wirtz, B. W. (2010). *Business Model Management: Design - Instrumente - Erfolgsfaktoren von Geschäftsmodellen*. Springer Gabler. <https://doi.org/10.1007/978-3-030-48017-2>
- Wirtz, B. W. (2013). *Electronic business* (4th rev. ed.). Springer Gabler.
- Wirtz, B. W., & Daiser, P. (2017). Business model innovation: An integrative conceptual framework. *Journal of Business Models*, 5(1), 14–34. <https://doi.org/10.5278/OJS.JBM.V5I1.1923>
- Wirtz, B. W., & Daiser, P. (2018). Business model innovation processes: A systematic literature review. *Journal of Business Models*, 6(1), 40–58. <https://doi.org/10.5278/ojs.jbm.v6i1.2397>
- 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. <https://doi.org/10.1016/j.lrp.2015.04.001>

- Wirtz, B. W., & Thomas, M.-J. (2014). Design und Entwicklung der Business Model-Innovation. In D. R. A. Schallmo (Ed.), *Kompendium Geschäftsmodell-Innovation* (pp. 31–49). Springer Gabler. https://doi.org/10.1007/978-3-658-04459-6_2
- Witte, E. (1973). *Organisation für Innovationsentscheidungen: Das Promotoren-Modell*. Schwartz Verlag.
- Wördenweber, B., & Wickord, W. (2008). Technologie- und Innovationsmanagement im Unternehmen: Lean Innovation. Springer-Verlag. <https://doi.org/10.1007/978-3-540-77694-9>
- Yao, F. (2011, August 12). *Insights into social network theory and entrepreneurship* [Conference Paper]. International Conference on Management and Service Science, Wuhan, China.
- Yin, R. K. (2003). *Case study research: Design and methods* (5th ed.). Sage Publications.
- Yin, R. K. (2011). *Applications of case study research*. Sage Publications.
- Yip, G. S. (2004). Using strategy to change your business model. *Business Strategy Review*, 15(2), 17–24. <https://doi.org/10.1111/j.0955-6419.2004.00308.x>
- 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. <https://doi.org/10.1016/j.lrp.2009.12.005>
- Zollenkop, M. (2006). *Geschäftsmodellinnovation: Initiierung eines systematischen Innovationsmanagements für Geschäftsmodelle auf Basis lebenszyklusorientierter Frühaufklärung* [Doctoral dissertation, Otto-Friedrich-Universität Bamberg]. Deutscher Universitäts-Verlag.
- Zollenkop, M. (2011). Geschäftsmodellinnovation im Spannungsfeld zwischen Unternehmensgründung und Konzernumbau. In T. Bieger, D. zu Knyphausen-Aufseß, & C. Krys (Eds.), *Innovative Geschäftsmodelle* (pp. 201–211). Springer-Verlag.
- Zott, C., & Amit, R. H. (2010). Business model design: An activity system perspective. *Long Range Planning*, 43(2/3), 216–226. <https://doi.org/10.1016/j.lrp.2009.07.004>
- Zott, C., & Amit, R. H. (2015). Business model innovation: Towards a process perspective. In C. E. Shalley, M. A. Hitt, & J. Zhou (Eds.), *The Oxford handbook of creativity, innovation, and entrepreneurship* (pp. 395–406). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199927678.013.0030>
- Zott, C., Amit, R. H., & Massa, L. (2011). The business model: Recent developments and future research. *Journal of Management*, 37(4), 1019–1042. <https://doi.org/10.1177/0149206311406265>
- Zurher, L. A. (1983). *Social roles: Conformity, conflict and creativity*. Sage Publications. [https://doi.org/10.1016/0362-3319\(86\)90046-7](https://doi.org/10.1016/0362-3319(86)90046-7)

Eidesstattliche Erklärung

Name: Mentges

Vorname: Sophie

„Ich erkläre hiermit eidesstattlich, dass ich die vorliegende Dissertation selbständig angefertigt habe; die aus fremden Quellen direkt oder indirekt übernommenen Gedanken sind als solche kenntlich gemacht. Die Arbeit wurde bisher keiner anderen Prüfungsbehörde vorgelegt und auch noch nicht veröffentlicht. Ich bin mir bewusst, dass eine unwahre Erklärung rechtliche Folgen haben wird.“

Kaiserslautern, 28.06.2022

Ort, Datum

S. Mentges

Unterschrift

CURRICULUM VITAE

SOPHIE MENTGES

Beruf

04/2017 – Heute **TU Kaiserslautern, Lehrstuhl für Marketing**
Wissenschaftliche Mitarbeiterin

Studium

04/2015 – 03/2017 **Masterstudium der Betriebswirtschaftslehre,**
TU Kaiserslautern

04/2011 – 08/2014 **Bachelorstudium der Wirtschaftswissenschaften,**
Johannes Gutenberg-Universität Mainz

Schulbildung

03/2011 **Abitur, Integrierte Gesamtschule Mutterstadt**