

# BUSINESS MODEL INNOVATION AND DIGITALIZATION: COULD AMBIDEXTERITY BE THE SOLUTION TO MANAGE BOTH? – A CONCEPTUAL FRAMEWORK WITH PROPOSITIONS

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## Abstract

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The current economic situation is in constant flux. Progress in technology and especially the advancement of digital transformation have influenced business endeavors. In this realm, digitalization is closely linked to a high degree of digital disruption and the development of new products, services, and business models. In this paper, we aim to investigate how enterprises simultaneously handle digitalization and business model innovation. We employ an ambidexterity perspective to gain new knowledge and get the traction that is needed to make a conceptual contribution. Thus, a theoretical framing that includes the relationship between business model innovation and digitalization and propositions congruent with our general gestalt of the inquiry will be developed. The results indicate, despite some structural and processual commonalities that digitalization and business model innovation share, the mission to manage both phenomena remains challenging. In particular, some peculiarities inherent in the ambidexterity perspective need to be taken into account. Particularly under the constraints of a high degree of resource scarcity, it is important to strive for sustainable actions that lead to increased value creation and competitive advantage. Thus, this study implements an ambidexterity perspective on the two distinct areas of technology and innovation and provide groundings for further research avenues on ambidexterity and firm performance.

**Keywords:** Digitalization, Business Model Innovation, Ambidexterity, Conceptual Framework, Resource Scarcity

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## 1. INTRODUCTION

The digital transformation as one of the most challenging phenomena results in rapid technological advances, increased competition, and

shorter business lifecycles (Boulton, Libert, & Samek, 2000; Hamel & Välikangas, 2003; Porter & Heppelmann, 2014). In this realm, new digital technologies induce unprecedented changes among businesses, industries, and markets (Nambisan,

Lyytinen, Majchrzak, & Song, 2017) and digitalization shows a predominance in nearly all areas of the economy (Berman, 2012; Zott & Amit, 2017). Mastering the challenges arising from technological innovation will define future endeavors. The beginning of the digital age traces back to the early 21st century to the advent of the internet, where products and services were transformed from analog to digital (Yoo, Boland, Lyytinen, & Majchrzak, 2012). Businesses used to be mostly tangible, quality-based, and customer-centric (Weill & Woerner, 2015).

The literature digitalization, as well as business model innovation (BMI), amassed over the years is extensive and received attention in research and practice (Bouwman, De Vos, & Haaker, 2008; Zott & Amit, 2010; Schneider & Spieth, 2013). Despite the benefits digitalization could offer, companies often face difficulties when confronted with innovation (Mansury & Love, 2008; Alegre, Sengupta, & Lapiedra, 2011; Seggie, Soyer, & Pauwels, 2017). However, the notion of BMI is regarded as the most ambitious type of innovation, as it has an enormous influence on value creation and capture mechanisms (Teece, 2010; Frankenberger, Weiblen, & Gassmann, 2013). Therefore, it is important to determine the dominant drivers for BMI initiatives (Schneider & Spieth, 2013). The processes of digital transformation and business model innovation are not mutually exclusive. Some authors even assume a complementary relationship (BarNir, Gallagher, & Auger, 2003). Respectively, a positive influence on firm performance as well as an innovative character and the inherent sustainability consciousness is assumed for both phenomena (Freiling, 2015). Furthermore, digitalization is considered a decisive external trigger for firms' business model innovation (Krys, 2011; Stüber, Hudetz, & Becker, 2017).

Still, investing in digitalization efforts and business model innovations at the same time remains a difficult venture for companies. A major factor influencing this interaction is resource scarcity (Jansen, Tempelaar, van den Bosch, & Volberda, 2009). Resources are not infinite and companies often have to do not have sufficient resources to optimally implement both innovative endeavors.

In an increasingly complex and dynamic business environment, companies are in need to be strategically ambidextrous to master the upcoming challenges linked to digital transformation and other disruptive changes (Shenkar, 2001). Thus, ambidexterity could be seen as a distinguishing factor for the company's success. Therefore, the ambidexterity perspective might help to identify key pathways when challenged with the situation to tackle both, technological and business model innovation. Drawing from ambidexterity literature, we investigate the question of how digitalization efforts and business model innovation are linked to one another and how both phenomena could be managed to incorporate the ambidexterity notion. Alas, the research landscape is still eclectic and in its infancy. The effects of digitalization on business model innovation and, vice versa, are diverse and insufficiently explored (Zott, Amit, & Massa, 2011; Prem, 2015). Accordingly, the first aim of this study is to shed light on this intertwined relationship, covered by the first research question.

*RQ1: How are business model innovation and digitalization linked to one another?*

Further, analyzing the impact of ambidexterity on the simultaneous execution of both aspects is subject of the second research question.

*RQ2: How is the deployment of an ambidexterity strategy in the relation between business model innovation and digitalization conducive to increase firm performance under the constraints of resource scarcity?*

This paper contributes to research and literature in several ways. Exploring the relationship between digitalization and business model innovation initiatives provides insight into possible interlocking effects and hold high potential to gather new knowledge.

Although several studies allocate the interrelation between digitalization and business models, such as Fleisch, Weinberger, and Wortmann (2015), their focus is specifically on unique business model designs. We extend the literature by developing a conceptual framework that links digitalization and business model innovation in a holistic concept with recent research on ambidexterity.

The role of ambidexterity in innovation literature is still in its infancy and rather scarce. There is still a paucity of research. Thus, we explore how ambidexterity moderates the relation between business model innovation and digitalization, arguing that this will made a substantial impact on the business model literature.

Transforming the business model is never easy, especially when it comes to digital issues. It is the aim of this study to improve the general understanding of the relation between both concepts and to prove that there are opportunities available to handle both phenomena simultaneously.

The remaining paper is structured as follows: Section 2 describes the conceptual groundings with the results of the systematic literature review and theoretical foundations. Section 3 explains in detail the construction of the conceptual framework with the propositions. Eventually, Section 4 gives concluding remarks and managerial implications and Section 5 states the limitations and mentions future research directions.

## 2. LITERATURE REVIEW

The underlying method of this paper is a systematic review of existing literature on business model innovation and digitalization with a conceptual framework and propositions being developed. The systematic literature review approach is useful to identify causal relationships, contradictions as well as already existing research strings (Cooper, 2003). Initially, digitalization is perceived as an external environmental factor that can act as a driver for business model innovation (Krys, 2011; Stüber et al., 2017). However, it appears that digitalization is also a new type of business model and an integral part of the value architecture (Mason & Spring, 2011; Bleicher & Stanley, 2017). As the purpose of this paper is to get a holistic overview of the topic a systematic literature review, based on the process steps provided by Tranfield, Denyer, and Smart (2003) and Snyder (2019). According to the taxonomy proposed by Snyder (2019), our research

can be regarded as semi-systematic. Due to the relatively low number of empirical studies in our research field, we wanted to both give an overview of different research areas as well as keep track of developments over time. However, we were slightly edging towards the creation of a new research framework (although less theoretically developed than possible in other fields), so a certain amount of the integrative review approach is also present.

With this objective, the five databases Business Source Complete, Emerald Insight, EconLit, EconIS, and Web of Science were searched with a broad combination of keywords. The keywords were identified in a preliminary analysis. The primary keywords used were synonyms for the term “business model innovation”. We purposely opted for a broad inclusion of keywords, as the term often overlaps with synonyms. This procedure was especially necessary, as no common understanding for the term business model exists or, in Magretta’s words, the term business model is “stretched to mean everything – and end up meaning nothing” (Magretta, 2002, p. 8). We used the terms business model\*, business model innovate\*, business design\*, business transform\*, business chang\*, organization inno\*, business strategy\*, firm inno\*, business innov\*. Among the secondary keywords were Digitiz\*, Digitis\*, E-business\*, digit\*, IT-driv\*, big data\*, data analy\*, automation\*, IoT\*.

These keywords were combined by AND-search logic with several secondary keywords epitomizing the digitalization perspective. In addition, the former keywords have been extended by the third term called “ambidexterity”, represented by the search terms ambidex\*, strategic ambidex\*,

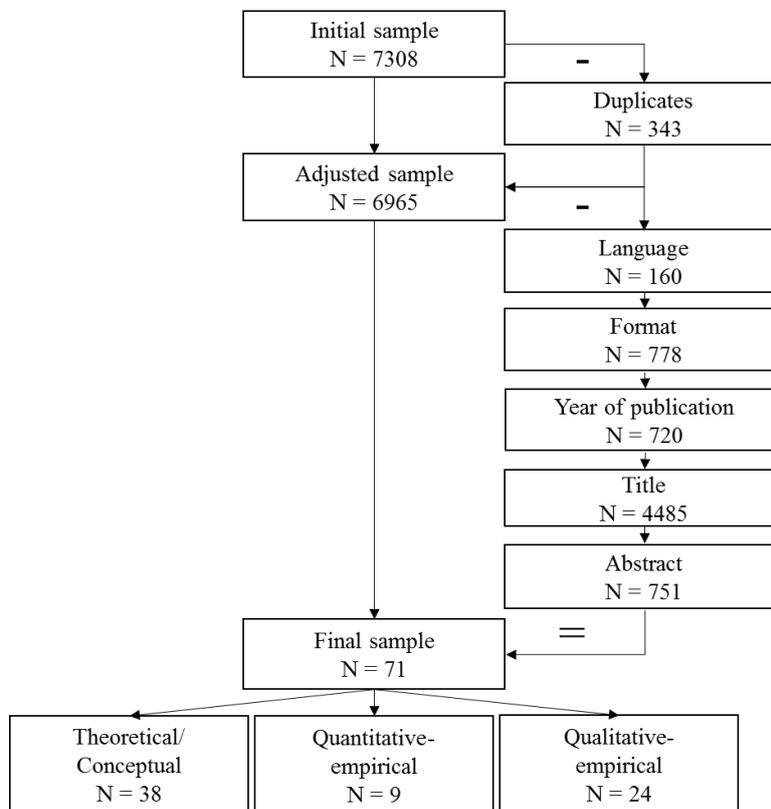
ambivalen\*, organizational ambidex\* and temporal ambidex\*.

Other comparable studies often limit the search string to articles published in academic journals that are validated by ranking schemata, such as VHB-Jourqual to ensure high sample quality. Tranfield et al. (2003) propose “searches should not only be conducted in published journals [...], but also comprise unpublished studies, conference proceedings, [...]” (p.215). As many studies, especially conference papers addressed the key topic of digitalization and business models, we purposely decided to stick to this procedure and not limit the study sample to high-quality studies. However, we deliberately applied some other exclusion criteria, such as limiting the search to articles in the English language, excluding books and grey literature, and limit the publication date after the year 2000. This date is known as the turning point in business model literature due to the advent of the Internet and the dot-com era, which changed the business model understanding from an operative to a strategic context and stressed the focus on digital technologies and their impact on innovation.

The largest reduction comes from the variable “title”. Here, as with Tranfield and other authors, the list of 4,485 hits was manually matched with the search topics – business model innovation and digitization. The titles that were obviously not related to both aspects were excluded from further analysis. The same was then repeated for the variable “abstract”.

The full review process is illustrated in Figure 1.

Figure 1. The systematic literature review process



### 3. RESEARCH METHODOLOGY AND FRAMEWORK DEVELOPMENT

In a first step and in accordance to find answers for *RQ1* it is necessary to distinguish the commonalities and differences between business model innovation and digitalization. Accordingly, Baden-Fuller and Haefliger (2013) and Stüber et al. (2017) postulate that the relation is bidirectional. In the following the most frequent supposed relationships between digitalization and business model (innovation) are pointed out.

#### 3.1. Digitalization

Today's economy is characterized by an unprecedented fast-paced nature and changes that come from all directions (Hickman & Silva, 2018). The digital transformation as a megatrend in the 21st century is decisively facilitating this progress by disrupting formerly existing patterns, procedures, standards, and business models (Slywotzky & Morrison, 2000). Amit and Zott (2001) state that "digitalization refers both to a transformation from "analog" to "digital" (e.g., a shift from cash to electronic payments) and to the facilitation of new forms of value creation (e.g., accessibility, availability, and transparency)". Bowersox, Closs, and Drayer (2005) widen the expression to the term digital transformation. Digital Transformation (DTP) is a "process of reinventing business to digitize operations and formulate extended supply chain relationships" (p. 22). A more holistic perspective is applied by Mazzone (2014) who states that "digital transformation is the deliberate and ongoing digital evolution of a company, business model, idea process, or methodology, both strategically and tactically".

Digitalization together with progressing technological change actuate new business processes and structures, which often lead to the obsolescence of traditional business practices and the adaption of innovation of business models (Boulton et al., 2000; Khanagha, Volberda, & Oshri, 2014). The advantages of this movement can hardly be denied. Through the digitalization and the internet as key digital infrastructure, information can be gathered in a very fast, effective, and inexpensive way (Hoffman, Novak, & Chaterjee, 1995). Furthermore, new communication standards and new digital value propositions put customer-centricity into the center of attention, simplifying the interaction with customers and other stakeholders due to the support of information and communication technologies (ICT), and lead to the reduction of transaction costs (BarNir et al., 2003). This improves internal cost management and facilitates internal processes (Tapscott, Ticoll, & Lowy, 2000; Feeny, 2001). Moreover, the richness and quantity of customer information improve customer satisfaction and customer experience (Berman, 2012). According to study results by Weill and Woerner (2015), pioneering companies that are at the forefront of digitalization, record higher revenue growth as well as higher net margins compared to less digitalized competitors.

Still, the challenging part is to include digital technologies in the company's structures and

processes (Weill & Woerner, 2015). For this purpose, firms need to possess new resources as well as dynamic and superior capabilities. Among these abilities are an open mindset for new ideas, innovation capacity, and the enhanced transformation of existing business models (Burns & Stalker, 1966; Berman, 2012). Therefore, digitalization can not only function as a competitive advantage (Berman, 2012) but foster internal efficiency and increases customer satisfaction (BarNir et al., 2003). We therefore propose:

*Proposition 1: The pursuit of digitalization initiatives positively affects firm performance.*

#### 3.2. Business model/Business model innovation

In times where we are "smart-just-about-everything" (Zott & Amit, 2017), companies face the challenge to revise their current business model constantly and adapt it to the upcoming changes or innovate it according to the new digital requirements (Boulton et al., 2000). Although business models and their innovations get popular in research and practice, literature does not specifically state how exactly and for what reason companies change their business model over time (Kijl & Boersma, 2010). Despite the increased interest, no common definition for the term business model could be found (Zott et al., 2011; Wirtz, Pistoia, Ullrich, & Göttel, 2016; Saebi, Lien, & Foss, 2017). This has led to a myriad number of contributions, whereas transparency in definition and consistency about the elements and performance effects are still missing. More precisely, Amit and Zott (2010) define a business model as "the content, structure, and governance of transactions designed to create value through the exploitation of business opportunities" (p. 215). Thus, business models are "structured management tools" (Wirtz et al., 2016) which are closely linked to firm performance (Zott & Amit, 2008; Aversa et al., 2015; Clauss, 2017; Haggège, Gauthier, & Ruling, 2017), resulting from their structural position underneath the firm strategy and on top of organizational/technological processes (Brew & Tucci, 2003). In accordance with other prominent authors from the research field of business model literature (Spieth & Schneider, 2016; Clauss, 2017; Rauter, Zimek, Baumgartner, & Schöggel, 2019), we opted for the definition by Teece (2010), claiming a business model to be "the design or architecture of value creation, delivery, and capture mechanism" (p. 172). This definition fosters the value of architecture inherent in business models.

As business models are defined as the design of the three value elements value proposition, value creation, and value capture, the value perspective is considerably important in this context. Thus, in accordance with the groundbreaking work by Zott and Amit (2008), we understand firm performance as Total Value Appropriated (TVA) by a firm's total transactions that the business model enables (Zott & Amit, 2008, p. 7).

In comparison to more traditional types of innovation such as product or process innovation, business model innovation attracts high attention due to the value-enhancing effect and the possible implementation of competitive advantages in the market (Horváth, 2017). Following the suggestions

by Christensen (1997), disruptive innovation comes mainly from technologies. More recently business models became the center of attention when it comes to innovation (DaSilva, Trkman, Desouza, & Lindic, 2013).

With contributions coming from a proliferating variety of research areas, the originally focused debate on business model innovation has become disconnected, “silo-driven” and intricate (Shafer, Smith, & Linder, 2005; Zott et al., 2011). For the underlying study we use the definition by Casadesus-Masanell and Zhu (2013):

*“At root, business model innovation refers to the search for new logics of the firm, new ways to create and capture value for its stakeholders, it focuses, primarily on finding new ways to generate revenues and to define value propositions for customers, suppliers, and partners”* (p. 464).

This definition depicts most likely the value architecture inherent in the business model concept and has already received substantial approval of many well-known authors (Amit & Zott, 2001; Casadesus-Masanell & Ricart, 2010; Casadesus-Masanell & Zhu, 2013; Teece, 2010; Gambardella & McGahan, 2010). Thereby, the distinction can be made.

Thus, when mentioning business model innovation, we suppose radical innovations. This leads to differentiation from merely incremental improvements in the business model (O’Reilly & Tushman, 2011; Khanagha et al., 2014).

In order to keep pace with today’s digital world, firms need to constantly adjust parts or even the complete business model, to stay ahead of the competition and adapt to changing customer needs (Meyer, 2014). Business models and business model innovation experienced the biggest attention with the advent of the Internet and the burst of the dot-com bubble (Freiling, 2015). However, business models have evolved over time and the level of complexity increased primarily through the existence of new digital technologies (Osterwalder & Pigneur, 2010). Bouwman et al. (2008) as well as Ghani and Zakaria (2013) consider technical features and digital technologies as important elements of a business model which, when implemented correctly, lead to unique and superior customer services.

In practice, business model innovations have been acknowledged as a potential activity for value creation in times of high environmental dynamism (Pohle & Chapman, 2006). However, innovating the inherent business model is not trivial and comes with a high degree of complexity (Tripsas & Gavetti, 2000; Chesbrough, 2010; Mezger, 2014). Many companies even fail to innovate their business model (Fleisch et al., 2015). In accordance with Hahn, Søren, and Stoyan (2014) the biggest mistake incorporated with business model innovation is, to set the wrong focus and overestimating the innovative power of digital technologies instead of concentrating on innovative value propositions for the customer. Based on this results the focus in innovation activities is upon value capture and value creation activities. Thus, we suggest the following proposition.

*Proposition 2: Business model innovation positively affects total value appropriated.*

### 3.3. The similarities between business model innovation and digitalization

One foundational insight from the literature review is the similarities between digitalization and business model initiatives. First, both focus a value perspective, divided into the three categories value proposition, value creation, and value capture (Teece, 2010; Clauss, 2017) for the customer. This results in the second similarity, the longevity of both concepts. This view originated in the coherence of technological and business model innovation (Chesbrough & Rosenbloom, 2002; Tongur & Engwall, 2014). The inherent dynamic of this relation leads to the acceleration of sustainability and long-lasting company goals and has a positive effect on firm performance (Cavalcante, Kesting, & Ulhøi, 2011; Berman, 2012; Amit & Zott, 2012; Baden-Fuller & Haefliger, 2013). Second, the theoretical underpinnings elaborate that both concepts are highly complex, associated with high efforts in execution (de Reuver, Bouwman, & Haaker, 2009; Schumann & Tittmann, 2015), require high resource utilization and high costs upon the transformation process (Zott & Amit, 2007). Third, both subjects can be characterized by the degree of implicit change that both business model and digitalization come along with (Schneider & Spieth, 2013). As stated in the beginning, digitalization is closely linked to a high degree of digital disruption, addressing nearly all areas of business and society (Berman, 2012; Zott & Amit, 2017). In the realm of business model innovation, the new core business logic coming with the innovation of business models hints towards the radical power behind this type of innovation (Bourreau, Gensollen, & Moreau, 2012). In the following, the most common relationships found in the literature will be explained in detail.

#### 3.3.1. Digitalization enables business model innovation

Digitalization is the key process in the digital revolution (Birkinshaw & Ansari, 2015). Generally speaking, digitization as the operative process in digitalization is known as the exercise of translating mainly analog structures, processes, or objects into digital content (Fichman, Dos Santos, & Zheng, 2014). Especially in times of high velocity and high environmental dynamism, digitalization acts as a technological trigger and affects innovative initiatives (Nambisan, 2013). Becker, Ulrich, and Stradtman (2017) go one step further and state a bilateral relationship for digitalization as an essential driver for business model innovation initiatives and vice versa. According to Bleicher and Stanley (2017), digitalization and advancements in the digital transformation are key drivers for the establishment of sustainable business models. Business model approaches become more valuable when they strategically incorporate digital success factors Prem (2015). Kurti and Haftor (2015) propose that digitalization leads to the disruption of traditional business models. Boyd and Crawford (2012) and McAfee and Brynjolfsson (2012) even suggest that in the digital era the rise of new digital technologies will induce the innovation of business models. The research results by Jiebing, Bin, and Yongjiang (2013) suggest that business models are

strongly driven by digital technologies and digital transformation. Results of this development are for example new dimensions of customer-centricity, learning effects for the implementation of digital technologies, and a higher degree of mass customization supported by technical know-how and practicability (Jiebing et al., 2013). Further, the digitalization drives business models because it enhances all three value elements of business models and changes the structure of the underlying value architecture (Clauss, 2017). Thus, the first approach highlights the complementary and even reinforcing relationship between digitalization and business model innovation.

### 3.3.2. Digitalization promotes new business model typologies

Within the digitalization, business models are the new innovative resource (Berman, 2012; Zott & Amit, 2017). Thus, through the digitalization obsolete business models are replaced by state-of-the-art models that are the outcome of an innovation process (Loebbecke & Picot, 2015; Weill & Woerner, 2015). Since the digital transformation process has received a lot of attention due to the industry 4.0 movement, the implicit innovation potential due to new digital technologies is important. Lingnau, Müller-Seitz, and Roth (2017) contribute to this debate by pointing out the advent of new digital technologies has led to the effect that traditional business models have become obsolete and subject to a re-make. Accordingly, the logical consequence is the transformation of existing business models and the change towards a suitable match of both. This calls for a paradigm shift and new exploitation of potential (Lingnau et al., 2017).

The term e-business model has been created around the year 2000 and is closely related to the advent of the internet and the new economy era (Hedman & Kalling, 2003). Since then, a huge number of researchers have dealt with business models on the Internet and e-business era (Timmers, 1998; Amit & Zott, 2001; Weill & Vitale, 2001). Formerly known as a concept for improved supply chain efficiency, in the meantime, the term e-business is widely accepted as an electronic period with a strong focus on connectivity and value creation in the digital age (Amit & Zott, 2001; Van der Vorst, Van Dongen, Nougouier, & Hilhorst, 2002). New types of industries, businesses, and business model types emerged in recent years. E-business models have become an independent research field with new businesses appearing in the IT, information systems, or the online sector. The business model navigator by Gassmann, Frankenberger, and Csik (2014) exemplifies 55 different combinations of business model types that are used in practice. These patterns had to be extended during the last years with some new patterns arising from e-business literature. Among these new business model types range, e.g., online/e-commerce businesses, explaining new sales mechanisms possible due to digital infrastructures (i.a., Goyal, 2017), crowdsourcing and/or crowdfunding (i.a., Majchrzak & Malhotra, 2013), two-sided and multi-sided platform business models (i.a., Hagiú & Wright, 2015) and freemium business models (i.a., Voigt & Hinz, 2016). These changes lead

consequently to new structures and architectures. Technological platforms leverage value for the firm itself, the customers, and stakeholders (Bouwman et al., 2008). Platform business models are for example closely linked to ecosystem architectures, cooperative networks (Evans & Gawer, 2016; Mäntymäki & Salmela, 2017; Sussan & Acs, 2017) and new technologies such as blockchain or bitcoins that are further disrupting the industrial environment (Tapscott & Tapscott, 2016; Belle, 2017). Hence, we conclude that digitalization contributes to the emergence of new business model types and opens up new research focus areas such as digital business model design.

### 3.3.3. Business model as a mediator between strategy and technology

The connection between business strategy and e-business applications business models has been treated as a tacit component of strategy and as a conceptual tool to decompose strategy from abstract level to operative level for e-business application. Business models are thus the interface between business strategy and information technology systems (Krstov, 2011). With the term “strategy”, we refer to the definition by Wheelen and Hunger (2001) who indicate that “strategy [...] forms a comprehensive masterplan but states how the [...] his mission and objectives [will be achieved]” (p. 67).

Business models can, therefore, be seen as the mediator between business strategy, business organization, and business technology (Osterwalder & Pigneur, 2004). According to research results by Veit et al. (2014), one pillar in the information systems research is business models as facilitator of the IS industry. Another research stream is dealing with business models as a connecting element between the technical implementation of innovative initiatives and firm performance. Hence, business models are the supportive element in finding, assessing, and implementing the right digital technology in the firm (Baden-Fuller & Haefliger, 2013). In many recent research results, the relationship between business models and technological innovation is the primary objective indicating that business models influence technological innovation and vice versa (Zott et al., 2011; Baden-Fuller & Haefliger, 2013). The main notion suggests that business models expedite the success of technological innovation (Chesbrough, 2010; Desyllas & Sako, 2013). Thus, digitization also provides new technologies like big data or platforms to design new business models according to the goal set by strategy (Paulus-Rohmer, Schatton, & Bauernhansl, 2016). Hence, the connection between business models as a linking element between strategy and digital, operational processes can be confirmed. However, this hierarchical structure is especially important in regard to the strategical implementation of business model initiatives.

### 3.3.4. Digital business models - the new standard?

A few years ago, Slywotzky and Morrison (2000) emphasized the term “digital business design” as the new approach to realize strategic decisions with the support of digital technologies. This becomes possible through the integration of technologies into

the elements of a business model to pursue strategic goals and contribute to increased firm performance and the establishment of competitive advantage. Brousseau and Penard (2007) share this opinion and label business models as central for innovations in the new age. These insightful results provide the groundwork for a new research arena which is labelled as “digital business models” (Veit et al., 2014). Prem (2015) explains that “digital” is the new standard attribute for business model elements. This also applies to the single elements of a business model. In the value proposition, products are often garnished with digital technologies such as RFID technology or sensors. Channels are constantly shifted towards online commerce with no intermediaries involved and among the key activities range automation, efficiency, and flexibility. Even revenue streams change from classic models to new alternatives such as freemium, licensing, or charging of a service fee (Prem, 2015).

As described by Bärenfänger and Otto (2015), a digital business model “is a model whose underlying business logic deliberately acknowledges the characteristics of digitization and takes advantage of them”. In practice, digitalization challenges business models with the aim to optimize existing processes, increase overall efficiency, quality of products and services, and reduces transaction costs (Berman, 2012; Nambisan et al., 2017; Vendrell-Herrero, Parry, Bustinza, & Gomes, 2018). A more nuanced perspective includes digital servitization, which are business models that enhance traditional non-digital goods and services with implementing digital technologies, as a key activity in a digital business model (Visnjic, Wiengarten, & Neely, 2016; Vendrell-Herrero et al., 2018). When it comes to business model innovation, Berman (2012) suggests that the core activity to successfully change a firm’s business model is the combination of physical components with digital parts in order to offer the customer a fully digital solution of both worlds.

Further, there is proof that business models, as well as digitization, separately contribute to enhanced competitive advantages and the increase in firm performance. We postulate that this might also be true for the interaction of business models and digitalization endeavors and propose a reinforcing effect. We therefore propose:

*Proposition 3: The joint effect of digitalization initiatives and business model innovation has a positive effect on firm performance.*

### 3.3.5. Resource scarcity

In volatile environments and increased competition among companies, industries, and markets, the problem of limited resources becomes a key challenge (Raisch & Birkinshaw, 2008; Jansen et al., 2009). Besides other theories, such as the configurational approach or the contingency theory, the resource-based view (RBV) is one of the most important theories in strategic management (Wernerfelt, 1984). For the underlying paper, the RBV and its two inherent streams, the Penrosean and the Barney view are used as conceptual grounding (Nason & Wiklund, 2018). Although much of the RBV work has focused on the characteristics of resources (Penrose, 1959; Barney, 1991; Helfat & Peteraf, 2003), the current theory is not clear on how companies

configure their resources to achieve superior firm performance. Hereby, the question arises whether corporate resources are sufficient for both digitization efforts and business model innovations, or whether an exclusive relationship has to be assumed due to resource scarcity.

Business model innovations, due to the radical shifts in value creation and capture and the development and disposal of specialized resources, are said to be very resource-intensive (Amit & Zott, 2012, p. 41; Khanagha et al., 2014). This explains, why this type of innovation ranges upon the most cost-intensive ones compared to other innovation types. According to Penrose, change the way resources and capabilities are used (use of resources and capabilities) and new business models result by changes in resources and capabilities within the organization (Penrose, 1959). Although much of RBV’s work has focused on the properties of resources, the current theory does not make it clear how companies are configuring their resources to achieve better business performance (Penrose, 1959; Barney, 1991; Helfat & Peteraf, 2003). In the context of resource scarcity, the question is, how companies can align their business model to implement the resource-intensive trend of digitization in order to increase efficiency and effectiveness (Vanhaverbeke & Noordehaven, 2001; Gueguen, 2009).

Ambidexterity is more likely to bring fruitful results when resource endowment is high (Sidhu, Volberda, & Commandeur, 2004; Goosen, Bazzazian, & Corey, 2012; Tempelaar & Van De Vrande, 2012). Therefore, the utilization of complementary resources and capabilities is the first step to increase the resource base (Khanagha et al., 2014). This limitation of resources is predominantly noticeable when it comes to exploration and exploitation initiatives (Auh & Menguc, 2005; Smith & Tushman, 2005; Sidhu et al., 2004) because companies are in most cases not able to deal with scarce resources internally and reach out for new opportunities from the external environment (Gupta, Smith, & Shalley, 2006; Jansen et al., 2009). This “amount of slack resources” (Lubatkin, Simsek, Ling, & Veiga, 2006) can, therefore, be seen as a moderator in the relation between ambidexterity and performance (Kyriakopoulos & Moorman, 2004; Venkatraman, Lee, & Iyer, 2007).

In summary, business model innovation is characterized by its high resource intensity and the need to deploy a wide range of capabilities and skills (Khanagha et al., 2014). Therefore, Raisch and Birkinshaw (2008) label it as the “ambidexterity challenge” to allocate the appropriate resources and master the demanding situation. This leads to the following proposition:

*Proposition 4: The pursuit of digitalization and business model innovation is subject to a conflicting relationship due to resource scarcity.*

## 3.4. Ambidexterity

When talking about two aspects or processes that need to be handled simultaneously, instantly the term ambidexterity comes into focus. Ambidexterity refers to the power of managing existing requirements while taking into account changes in the environment (Duncan, 1976; Gibson & Birkinshaw, 2004). Just as stated by Tushman and

O'Reilly (1996) ambidexterity is the "ability to simultaneously pursue both incremental and discontinuous innovation and change" (p. 24), which indicated the innovative perspective in ambidexterity literature. In line with Raisch and Birkinshaw (2008), who fundamentally contributed to the ambidexterity literature, ambidexterity in an organizational context is understood as "an organisation's ability to be aligned and efficient in its management of today's business demands while simultaneously being adaptive to changes in the environment" (p. 375).

Ambidexterity is rooted in the study results by Duncan (1976), who associated the term with the companies' need to establish appropriate structures, such as an ambiguous memorandum, to keep track of innovation. As reported by March (1991), ambidexterity includes dual functions: the exploration of new alternatives on the one hand and the improvement or exploitation of already existing competences simultaneously. March and Simon (1958) were one of the first ones to address the partially paradoxical requirements between exploitation and exploration and the need for a balancing relation. March's (1991) initial broad notion of exploitation was associated with attributes such as 'refinement', 'efficiency', or 'execution', while he associated exploration with 'search', 'variation', or 'innovation'. Further distinctions enhance the understanding of both levers. Rosenkopf and Nerkar (2001) link exploration to characteristics such as organic structures, improvisation, and autonomy. Whereas exploitation is further widened to attributes such as mechanistic structures, path dependency, and routines (Benner & Tushman, 2003; Beckman, Hauschild, & Phillips, 2004). In this paper, we argue that exploration and exploitation enjoy a paradoxical relationship (Andriopoulos & Lewis, 2009; Raisch & Zimmermann, 2017; Smith & Lewis, 2011) and generate persistent organizational tensions (Lubatkin et al., 2006; Smith & Lewis, 2011). In principle, ambidexterity has proven to positively influence firm performance (Markides & Charitou, 2004; Lubatkin et al., 2006; Bierly & Daly, 2007; Burton, O'Reilly, & Bidwell, 2012).

Ambidexterity perspective is multivariate with many intertwined relations among customers, markets, networks, technologies and business models (Smith & Tushman, 2005; Simsek, 2009; Aspara, Lamberg, Laukia, & Tikkanen, 2011) and has been associated with several forms of innovation such as technological innovation, organizational innovation as well as business model innovation (McGrath, 2001; Katila & Ahuja, 2002; Yang & Atuahene-Gima, 2007; Rothaermel & Alexandre, 2008; Burgers, Jansen, Van den Bosch, & Volberda, 2009; Markides, 2013). We, therefore, deepen the understanding of the ambidexterity perspective for the two main factors business model innovation and digitalization in the following sections.

### *3.4.1. Ambidexterity perspective on business model innovation*

Several authors have already dealt with ambidexterity in the business model context, addressing the need to cope with two or more business models among one company

simultaneously (Gilbert, 2005; Markides, 2008; Zott & Amit, 2010; Bower & Christensen, 2011; Bock, Opsahl, George, & Gann, 2012). Only a few studies use an empirical approach to prove results between ambidexterity and firm performance in business model literature. Albeit, there has been proved for the importance of exploitation and exploration activities among business model innovation initiatives (Sosna, Trevinyo-Rodriguez, & Velamuri, 2010; Osiyevskyy & Dewald, 2015). For example, former results by Osiyevskyy and Dewald (2015) indicate that exploitation and exploration can be used to respond to environmental changes either by ignoring the threat entirely, jettison the current business model and replace it by an entirely new business model through exploration activities, the combination of searching for new alternatives but also sticking to the old business model in parallel or choosing the incremental innovation and adapting the current business model.

The two basic levers of ambidexterity are exploitation and exploration mechanisms (Gibson & Birkinshaw, 2004). According to Levinthal and March (1993), exploitation and exploration activities are both profound activities to first, secure the firm's current profitability as well as proactively engage in future profitability. There is an ongoing debate about the linkage between exploitation and exploration activities. The first research school testifies a contradictory relation between exploitation and exploration (Levinthal & March, 1993; Floyd & Lane, 2000; Ancona, Goodman, Lawrence, & Tushman, 2001; Andriopoulos & Lewis, 2010; Smith & Lewis, 2011; Raisch & Zimmermann, 2017). This is based on the fact that both factors have fundamentally different characteristics (McGrath, 2001; Siggelkow & Levinthal, 2003; Gupta et al., 2006). However, one common feature is the complementarity and intensifying effect when applied simultaneously (Auh & Menguc, 2005; Katila & Ahuja, 2002; Raisch, Birkinshaw, Probst, & Tushman, 2009). The second school of thought debate for an integration of both levers and stresses the need for coordination (Lewis, 2000). It is not clear, whether the balance of exploitation and exploration can really be achieved. However, no matter if a trade-off between exploitation and exploration exists, the incorporation of both levers (He & Wong, 2004; Raisch & Birkinshaw, 2008; O'Reilly & Tushman, 2013; Junni, Sarala, Taras, & Tarba, 2013) in ambidexterity leads to sustainable organizational success (Levinthal & March, 1993; He & Wong, 2004; Gupta et al., 2006; Lubatkin et al., 2006).

Business model innovation purposely means that not only one element is adapted or subject to change, but mostly several elements such as the value proposition, the value delivery structure, or the customer relation are renewed in a fundamental way (Chesbrough, 2007; Baden-Fuller & Haefliger, 2013). According to Markides (2006), changes in business models are closely interlinked with disrupting technologies which lead to the questioning of a firm's robustness of resources and capabilities. The learning ability to handle the trade-offs from exploring new business models and not leaving behind the already existing one especially depicts the business model architecture (Markides, 2013). Resource endowment and constant adaptations

are the main learning enablers in this process (Khanagha et al., 2014).

The term exploration includes characteristics such as “search, variation, experimentation, risk-taking, and innovation” (March, 1991), why we purposely link the exploration lever to business model innovation.

### 3.4.2. Ambidexterity perspective on digitalization efforts

The empirical linkage between the utilization of digital technologies and the corresponding impact on firm performance is rather scarce (Kahin & Brynjolfsson, 2000). E-business connects the utilization of digital technologies across different business functions and positively affects resources and capabilities across the company and leads to an increase of customer satisfaction (Chang & Li, 2003). According to Pisano and Verganti (2008) digitalization is one way to reduce costs for innovative ideas and the execution of innovative initiatives. Lubatkin et al. (2006) even include several innovation perspectives into their ambidexterity construct measurement and thus prove the connection between the two aspects. Exploitation is measured by asking about the degree of thinking “outside the box”, ability to explore new technologies, innovative products, and services, creative ways to satisfy customer needs, venturing into new markets and proactively targeting new customer groups (Lubatkin et al., 2006). Furthermore, the exploitation of IT is defined as the constant usage of digital technologies and digital processes. March (1991) names terms such as refinement, efficiency, selection, implementation, and execution for exploitation. When comparing these measurement items with business model innovation, it becomes clear, that all the measures literally depict the elements a business model consists of and how these elements can be innovated. Therefore, we subsume, that exploration activities correspond to engagements in business model innovation. In a comparable manner, Kulatilaka and Venkatraman (2001) link the design of a digitalization strategy with the definition of corresponding business models under the development of firm capabilities and the observation of changing market conditions.

In accordance with Lubatkin et al. (2006) exploitation incorporates improving quality and lower cost, increased reliability of products and services, increased efficiency level in operations, surveying customer satisfaction rate and constant adaptations to keep customers satisfied. These activities are similar to the characteristics of digitalization. Thus, we declare, that exploitation activities correspond to engagements in digitalization endeavors. While various different viewpoints of innovation have been used in the ambidexterity context, by now none has been focused on the ambidextrous handling of BMI and digitalization. According to Sarkees and Hulland (2009), the simultaneous pursuit of efficiency mechanisms and innovation activities is labeled as an ambidextrous strategy, which is in line with Gneuss (2016). Ambidexterity epitomizes an organizational strategy that combines conflicting business activities and reunites them in one

common strategy (Raisch & Birkinshaw, 2008). In the context of business model innovation and digitalization, this means strategically renewing existing business models through innovations and simultaneously ensuring competitiveness and sustainability through new digital service components. The use of new business models as a mechanism to drive the digital transformation process could represent a valuable ambidexterity strategy.

## 3.5. Ambidexterity dimension for the suggested relationship

### 3.5.1. Structural ambidexterity

Structural ambidexterity in the literature indicates that companies or institutions create specifically architectural structures or ecosystems to unite adverse notions (Smith & Tushman, 2005; O’Reilly, Harreld, & Tushman, 2009; Martin & Eisenhardt, 2010; O’Reilly & Tushman, 2011; Burton et al., 2012; Hill & Birkinshaw, 2014). This is based on the fact that exploitation and exploration activities have different characteristics in nature and therefore need customized structures (Cooper & Clayton, 1992; Tushman & O’Reilly, 1996; Gilbert, 2005; Raisch & Birkinshaw, 2008).

Duncan (1976) was one of the first to use the term structural ambidexterity, meaning conflicts in the equilibria between new activities and the improvement of already existing structures, calling for the need for “dual structures” to manage the situation. The unifying connector upon these dual structures is a common strategy linked with normative values (O’Reilly & Tushman, 2004; O’Reilly et al., 2009). Representatives who share this position argue in favor of structural separation as the best solution to manage dual structures (Bower & Christensen, 2011; Zook, 2011). In ambidexterity literature, two distinctive dimensions of ambidexterity are often distinguished. Structural ambidexterity implicates the establishment of parallel structures for the two main activities exploration and exploitation (Tushman & O’Reilly, 1996). Internally in the company, even spin-offs are possible (Tushman & O’Reilly, 1996). Spin-offs can be separate units in one overall organization (Drucker, 1985; Galbraith, 2002) or the establishment of mutually exclusive business units (Tushman & O’Reilly, 1996). For the underlying case, this would mean that business model innovation and digitalization are structurally separated either by dual structures or the establishment of a distinctive business unit for either of the two topics. This is mostly the case in practical business and traces the view of two independent subjects whereas digitalization is enforcing business model innovation and vice versa (Loebbecke & Picot, 2015; Lingnau et al., 2017).

For the implementation of structural ambidexterity, some dedicated interventions can be called upon. These include the loosely coupling subunits (Benner & Tushman, 2003). All structures must be reunited under the responsibility of the senior management (O’Reilly & Tushman, 2004) working on searching, sensing, and seizing dynamic capabilities to make the structures work (Teece, 2010) as well as communicating a transparent

corporate vision (O'Reilly & Tushman, 2004). Learning capabilities and an open mindset are key factors in this development (Duncan, 1976; Benner & Tushman, 2003). First, major transitions in firm structures can be disruptive and conflicting to corporate culture (O'Reilly & Tushman, 2013). Furthermore, only a few companies are equipped with sufficient resources and learning capabilities to establish two distinctive business units for innovative exploration and the exploitation of digital transformation initiatives. We, therefore, argue that:

*Proposition 5: Structural ambidexterity with regard to business model innovation and digitalization is negatively affecting firm performance.*

### 3.5.2. Temporal ambidexterity

The counterpart to structural separation is a temporal cycle between exploitation and exploration activities (Nickerson & Zenger, 2002; Siggelkow & Levinthal, 2003; Venkatraman et al., 2007). Analogously, Adler, Goldoftas, and Levine (1999) call this mechanism "temporal separation" where the focus alternates between tasks on a timely basis but is still kept in one business unit. Moreover, many other authors force this ambidexterity dimension to temporal switch or cycle between exploitation and exploration (Burgelman, 2002; Gupta et al., 2006). O'Reilly and Tushman (2013) adapt to this idea and label it "temporal shifting". In conclusion with Nickerson and Zenger (2002) as well as Boumgarden, Nickerson, and Zenger (2012) incorporating this method and labeling it as oscillating between organizational structures and activities, it is easier than changing the entire corporate culture. Further, the study results by Siggelkow and Levinthal (2003) reveal that a time-restricted decentralization is an effective lever to exploit and explore innovation. In order to achieve both, this is also closely connected to long-term firm performance and sustainability (O'Reilly & Tushman, 2013). The term cyclical ambidexterity was mainly coined by Simsek (2009). Temporal ambidexterity is basically functioning as a solution for four major distractions: diverse objectives, management of resources, serving the market properly, and coping with uncertainty. As temporal ambidexterity is highly linked to the pursuit of short-term and long-term goals in parallel with cyclical shifts, the above-mentioned tensions are rather unlikely to become major challenges. Further, Casadesus-Masanell and Ricart (2010) emphasize that business models generate upright cycles that strengthen the overall business architecture and pursue short- as well as long-term performance goals. In accordance with Sosna et al. (2010), business model innovation as well as digitalization initiatives have to be seen as trial-and-error -processes in which stages of exploration are seamlessly effecting exploitation activities, which

eventually forms a loop-process with different cycles where the elements are reinforcing each other. For this reason, we propose the following relationship:

*Proposition 6: Temporal ambidexterity with regard to business model innovation and digitalization is positively affecting firm performance.*

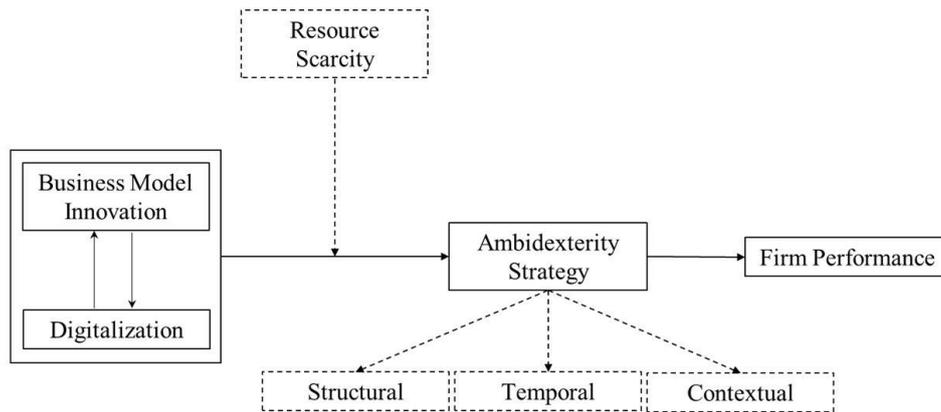
### 3.5.3. Contextual ambidexterity

Contextual ambidexterity is the third dimension in ambidexterity literature and positions as a counterpart to the two already mentioned dimensions. According to Gibson and Birkinshaw (2004), contextual ambidexterity can be defined as "the behavioral capacity to simultaneously demonstrate alignment and adaptability across entire business units" (p. 209). Alignment, in this case, refers to the consistency of all business patterns in the corresponding organizational unit, and adaptability refers to flexibility and agility to quickly adjust to dynamic environments (Gibson & Birkinshaw, 2004). The main difference compared to the other two forms is the focus on the behavioral perspective in contextual ambidexterity rather than structural issues (Luzon & Pasola, 2011). The term contextual is attributed to the organizational context (Gibson & Birkinshaw, 2004). Comparable to the mechanisms of structural ambidexterity, contextual ambidexterity is mainly supported by the usage of meta-routines and job enrichment activities (Adler et al., 1999). Supplementary, the construction of an overall vision with strategic flexibility is important (Bartlett & Ghoshal, 1989) as well as the inclusion of leaders with a strong sense for analytical and behavior-based processes (Denison, Hooijberg, & Quinn, 1995; Lewis, 2000). In this form of ambidexterity, the simultaneous pursuit of exploitation and exploration initiatives is regarded as "meta-level capacity" which included innovative actions with arising opportunities as well as the handling of already existing processes and systems (Gibson & Birkinshaw, 2004). This dimension is characterized as rather open and flexible in the amount of time and effort spent on both handles. Schreyogg and Sydow (2011) argue that it is the natural choice of a company to combine the act of searching for new opportunities and further strengthening already existing capabilities internally. This self-awareness process and the rather behavioral instead of fixed structural perspective leads to high degrees of freedom and the pursuance of sustainability as well as long-term performance (Luzon & Pasola, 2011). Thus, we suggest that:

*Proposition 7: Contextual ambidexterity with regard to digitalization and business model innovation is positively affecting firm performance.*

With inference to the above mentioned effective relationships, we propose the following conceptual framework:

Figure 2. Research conceptual framework



#### 4. RESULTS AND DISCUSSION

While business model innovation and digitalization are important research strings in academia as well as activities in practice, the combination of both concepts in literature is rather neglected. Especially the fact of how both processes can be simultaneously realized for short- and long-term performance (Raisch & Birkinshaw, 2008; Hu & Chen, 2016).

Generally, digitalization and business model innovation initiatives have both different effects on firm performance, whereby both are equally important for long term survival and overarching success. The derived conceptual framework seizes this linkage and unifies it under an ambidexterity perspective. We postulate that business model innovation and digitalization are both important success factors for firm success, but in order to handle both parts equally, an ambidexterity perspective is key. Therefore, we suggest that in business practice dealing with the process, processes are a dared venture with high complexity and risk involved. We further propose that companies do not have the affordable capabilities to deal with such monumental tasks in parallel, especially under constraints of resource scarcity. Thus, ambidexterity might be the initial pathway for firms to first analyze the current status quo and in a second step take appropriate measures to seize for digital and innovative affordances. This procedure requires an honest and traceable distinction between a firm's resources and capabilities, as well as strategy level, business model structure, and operational processes. An appropriate ambidexterity strategy might help to identify the moderators of this architecture. Companies with a rather analog business model or ones that just recently started to adapt either the business models or other parts of the company due to the affordances of the digital transformation are well-advised to rethink their current business model and survey all interfaces that have the potential to be changed. Once the decision in favor of digitally-driven business models is made, the choice for the right ambidexterity dimension might support the upcoming processes.

Structural ambidexterity refers to structural conditions. In the case of business model innovations and digitalization, this means how and where these two processes are set up and

implemented and who is responsible for both. In principle, there is the possibility of a separate structure, which means that the digital transformation is implemented in an independent department and innovative ideas originate from another area. However, very few companies in today's world can afford independent structures that focus exclusively on exploration initiatives. This could only lead to the test that reductive tasks are taken over in two different departments and the efficiency for the entire company decreases. Furthermore, economies of scope can only be used to a limited extent. However, the advantage of this approach could be the high level of specification.

Temporal ambidexterity, on the other hand, indicates that a complementary relationship between business model innovations and digitization exists, with a reinforcing effect occurring over time. Hence, it is important to set appropriate time limits for the cyclical process with no unnecessary overlaps. In this scenario, one business unit is responsible for both activities at the same time. This would be conceivable within the strategy department, which deals with both topics anyway, and inevitably has to build up the technological know-how additionally or bring it into the team. In terms of costs, this alternative seems to be much more efficient, since it involves the expansion of a department and this can usually be achieved under the umbrella of centralization. In addition, learning and experience effects can be implemented within the framework of process design.

The third form of ambidexterity, contextual ambidexterity, deals with significantly different circumstances. Structural design is less important whereas the behavioral component counts. In doing so, strong reference is made to the culture of a company. Since culture is closely linked to strategic alignment, we believe that it makes sense to take a closer look at this form of ambidexterity. Another positive aspect of this development is the meta-level which is required for the configuration of the process of business model innovation and digitalization. For companies, it is crucial that they proactively determine certain decisions of this development.

In summary, when faced with the challenge to deal and handle two major effects simultaneously, ambidexterity is always a useful solution alternative to keep in mind. This accounts also for the handling

of business model innovation and digitalization initiatives simultaneously. However, ambidexterity unleashes all its power only by strategically linking the existing exploitation and exploration activities (O'Reilly & Tushman, 2007). This requires multiple actions in the company, such as a tone from the top which integrates shared values, a common vision, and an open-minded leadership structure that benefits corporate culture and adopts strategic orientation (Raisch & Birkinshaw, 2008). In fact, these processes incorporate the inherent value perspective which is necessary to cope with both, innovation and digitalization initiatives.

## 5. CONCLUSION

This study is, to the best of our knowledge, the first one to link business model innovation and digitalization as two crucial manifestations under the overall ambidexterity umbrella. The objective of the study is to give insights about the linkage between digitalization initiatives and business model innovation and, based on this relation, to develop a conceptual framework that stresses the ambidexterity mechanism. Therefore, this is the first step for further research which requires empirical testing to prove the derived proposition. Thus, we propose to deepen this view and establish well-researched measures for all the main variables, which are digitalization, business model innovation, and ambidexterity, with the three sub-clusters.

As firm performance is an integral part of this paper, its measurement in future studies has to be evaluated. We suggest the scale by Amit and Zott as a proxy for firm performance, who stated that firm performance is the total value appropriated by a firm (Amit & Zott, 2001). This might be subject to an

ongoing debate. Since we do not want to leave this issue uncommented, we would like to present a further possible firm performance measurement scale, which is the one by Venkatraman and Ramanujan (1986). This scale provides a formative measure for subjective firm performance and has been used in prior research projects.

Further research avenues open up in the different ambidexterity notions that can be applied for innovative and digital initiatives. Furthermore, the specific design of ambidexterity calls for profound distinction. For structural ambidexterity, the question is, who is in charge of the dual structures and what capabilities need to be adapted to manage this responsibility. For temporal or cyclical ambidexterity the pressing question arises which time intervals are most suitable for the topical switch? More research is needed in later life-cycle stages where both projects are growing. It would be interesting to know, which of the two levers, either business model innovation or digitalization is contributing more to firm performance in the short or long run. This leaves open questions for future research. With regard to the contextual ambidexterity perspective, the behavioral viewpoint and the adaptations made to corporate culture are key indicators. Resource scarcity is a major obstacle in the simultaneous pursuit of innovation and technological endeavors. Therefore, resource endowment and resource management are important questions that need to be considered in the relationship.

From a research perspective, the topic could best be extended by real cases, i.e., case studies or field studies, as this form of research best allows to explore the "how" and "why" of ambidexterity in the context of business model innovation.

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