



Dissertation

Managing Resource Constraints in Firms

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Small, new or foreign firms inherently have a lower likelihood of surviving in the market. Frequently, this is due to the existence of resource constraints, such as the liabilities of smallness, newness or foreignness. Consequently, to survive in the market, small, new or foreign firms need to find efficient ways to use their resources. Multiple ways to alleviate these problems have been discussed in the literature, which include digitalization, internationalization, or outsourcing relationships. The usage of digital technologies, entering foreign markets or partnering with established organizations have been found to have compelling advantages and, thus, are promising practices for small, new and foreign firms in overcoming those constraints. It is, however, surprising that little is known about relevant aspects of these practices. For instance, research has just begun to investigate the influence of digital technologies on small and new firms, misses to investigate the success factors in the internationalization of small, new and foreign e-commerce firms, or has not fully investigated methods to improve performance of small firms in outsourcing relationships. Drawing on extant research on digitalization, internationalization, and outsourcing this cumulative dissertation presents four research papers. Each paper contributes to fill existing research gaps in the respective literature. All papers investigate a particular type of small firm and examine potential ways to handle scarce resources. Beyond the theoretical and practical contributions of each research paper, this dissertation in its entirety presents several implications for practitioners in small, new and foreign firms that will help them to overcome resource constraints. Furthermore, the thesis discusses implications for theory, limitations, and avenues for further research.



Managing Resource Constraints in Firms

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Table of abbreviations

ANOVA	analysis of variance
API	application programming interfaces
AVE	average variance extracted
e.g.	for example (Latin: <i>exempli gratia</i>)
et al.	and others (Latin: <i>et alii</i>)
H	hypothesis
HTMT	heterotrait-monotrait ratio
i.e.	in other words (Latin: <i>id est</i>)
IT	information technology
n	number
p.	page
pp.	pages
PLS	partial least squares
R&D	research and development
RBV	resource-based view
SEM	structural equation modeling
TCE	transaction cost economics
VHB	Verband der Hochschullehrer für Betriebswirtschaftslehre (German Academic Association for Business Research)
VIF	variance inflation factors

1 Introduction

1.1 Motivation and research gap

Many firms struggle to survive in the long run. In particular, firms that are small, new or foreign may have a low likelihood of surviving in the market (Chaganti & Chaganti, 2012; Nummela, Saarenketo, & Sharon, 2014). Indeed, a study by the Harvard Business School highlights that about 75% of all new ventures [a specific type of small and new firm in the entrepreneurial environment] fail (Gosh, 2012). The high failure rate may be attributed to a lack of competitive advantage or existing resource constraints, such as the liabilities of smallness (Djupdal & Westhead, 2015; Fackler, Schnabel, & Wagner, 2013), newness (Djupdal & Westhead, 2015) or foreignness (Fernhaber & McDougall-Covin, 2014; Zaheer, 1995). While smallness is characterized by a lack of tangible resources, such as financials, which impede scaling effects (Fackler et al., 2013; Nummela et al., 2014), newness restricts firms' experience and expertise (Barney, 1991; Fackler et al., 2013; Stinchcombe, 1965), and foreignness creates unfamiliarity with international markets along with a shortage of legitimacy in new countries (Fernhaber & McDougall-Covin, 2014; Zaheer, 1995). Consequently, to survive in the market, small, new or foreign firms need to find ways to efficiently manage their limited tangible and intangible resources (Davidsson, Baker, & Senyard, 2017; Djupdal & Westhead, 2015; Steininger, 2019).

Multiple ways to alleviate these problems have been discussed in the literature, which include digitalization, internationalization and outsourcing. *Digitalization* describes the usage of digital technologies in, among others, the business environment (Autio, 2017; Legner, Eymann, Hess, Matt, Böhmman, Drews, . . . , Ahlemann, 2017) and has been established as a source of competitive advantage (Autry, Griffis, Goldsby, & Bobbitt, 2005; Hull, Hung, Hair, Perotti, & Demartino, 2007; Martin & Javalgi, 2016; Parviainen, Tihinen, Kääriäinen, & Teppola, 2017). Specifically, digitalization may create benefits by fostering efficiency and flexibility (Bleicher & Stanley, 2018; Henriette, Feki, & Boughzala, 2016; Nambisan, 2017). The usage of digital technologies, for instance, enables firms to derive digital solutions along the entire value chain (DeLone & McLean, 1992; Ladeira, Ferreira, Ferreira, Fang, Falcão, &

Rosa, 2019). Further, digitalization also provides new opportunities for small and new firms to internationalize due to options to sell products online with lower marginal costs (Grant & Bakhr, 2004; Stallmann & Wegner, 2015). *Internationalization*, which is the “gradual, incremental, or evolutionary process, with increasing involvement of firms in foreign markets” (Yu & Si, 2012, p. 525), is another source to derive competitive advantages (Joensuu-Salo, Sorama, Viljamaa, & Varamäki, 2018; Schweizer, 2014; Yu & Si, 2012). Specifically, internationalization fosters sales, market share and, consequently, facilitates firm’s growth (Park & LiPuma, 2020). The internationalization of firms can also be reached by a partnership with established international players (Child & Hsieh, 2014). A common business practice in this regard, especially for small manufacturers, is the outsourcing relationship with international retailers (Kang, Wu, Hong, & Park, 2012; Li, Xie, Teo, & Peng, 2010). *Outsourcing*, finally, describes the shift of non-key activities to other organizations with the necessary expertise (Kang, Wu, Hong, Park, & Park, 2014; Lagunes, Valle, & Castillo, 2016). Working together with established organizations through outsourcing relationships, enables small firms to exploit technologies, expertise and capabilities of the partner organization in the home or foreign market (Chaurasia, 2014; Kang et al., 2014; Lagunes et al., 2016).

A large body of research investigates strategies to manage competitive advantages and resource constraints; however, research lacks a detailed understanding of digitalization, internationalization and outsourcing relationships for small, new and foreign firms. While research has focused on many aspects of resource efficiency in the past (Buckley, 1989; Penrose, 1959), only very recently digitalization came into the limelight as performance driver for small and new firms. For many years research on digitalization was mainly concerned with established firms rather than small and new ones (Devos, van Landeghem, & Deschoolmeester, 2010; Obwegeser, Araújo Burcharth, & Carugati, 2016). For example, while the literature has identified a digital strategy on organizational level as an option to influence the usage of digital resources to generate differential value for big corporations (Bharadwaj, Sawy, Pavlou, & Venkatraman, 2013), it neglects to assess the potential of a digital strategy for small and new firms to increase the degree of digitalization. At the same time, while the great potential of

digitalization was empirically investigated for established organizations in terms of, for example, resource savings, operational efficiency or flexibility (Bleicher & Stanley, 2018; Henriette et al., 2016; Nambisan, 2017), research neglected to empirically investigate the benefits of digitalization for small and new firms as an option to overcome their resource constraints. Furthermore, while the literature has identified digitalization as game changer for doing business in international markets (Maaradj, 2009; Parviainen et al., 2017), it does not examine the internal success factor in the internationalization of small, new and foreign e-commerce firms. Additionally, while outsourcing relationships between small manufacturers and international retailers have long been studied in the literature (Heshmati, 2003; Kang et al., 2012), a fine-grained understanding of formal and informal organizational control mechanisms (i.e., rules and regulations that direct the behavior of business partners [Kang et al., 2012; Lu, Yuan, & Wu, 2017]) in outsourcing relationships to improve outsourcing efficiency and effectiveness is not existing.

This cumulative dissertation fills existing research gaps of managing competitive advantages and resource constraints. It consists of four research papers on small, new and foreign firms and different ways to derive competitive advantages, namely the usage of digital technologies, internationalization as well as control mechanisms in outsourcing relationships. While the first three research papers use new ventures as example for small, new and foreign firms, the fourth research paper refers to small manufacturers. Research papers I to III aim to partially fill the void in the literature in the field of digital entrepreneurship, a research stream that studies the intersection of digital technologies and entrepreneurship (Berger & Kuckertz, 2016; Berger, von Briel, Davidson, & Kuckertz, 2018; Nambisan, 2017; Steininger, 2019). In this regard, a digital strategy, the benefits of digitalization as well as success factors in the internationalization of new e-commerce ventures are studied. In contrast, research paper IV contributes to the literature and practice by studying the influence of control mechanisms on manufacturers' outsourcing performance.

Research on digitalization, internationalization and outsourcing contributes to the literature by joining the discussion how firms can overcome the liabilities of smallness, newness and foreignness (Djupdal & Westhead, 2015; Fornes & Cardoza, 2015;

Symeonidou, 2013). In addition, understanding the influence of digitalization, internationalization and outsourcing relationships of small, new and foreign firms is important for such firms to better allocate their limited amount of resources. Moreover, it can support small, new and foreign firms in improving their performance by deriving competitive advantages, which can ultimately contribute to improve the survival rate of those firms (Nummela et al., 2014; Yu, Chen, & Nguyen, 2014). Increasing the success rate of small, new and foreign firms may also have positive effects for the economy, as those firms generate jobs, create incomes and drive innovativeness (Stawasz & Głodek, 2010).

The remainder of this dissertation is structured as follows (see Figure 1 for an overview of the six chapters comprising this dissertation). The next subchapter provides a summary of the research papers included in this dissertation to provide an introduction for the following chapters. Subsequently, the four different research papers are presented, in that the second chapter presents research paper I, which deals with the influence of a digital strategy on the degree of digitalization in new ventures. Afterwards research paper II, that assesses the benefits of a stronger degree of digitalization for new ventures, is introduced in the third chapter. The influence of digitalization on new ventures is also relevant in the fourth chapter, which introduces research paper III on success factors in the internationalization of new e-commerce ventures. The fifth chapter encompasses research paper IV that investigates the influence of control mechanisms on manufacturer's outsourcing performance. Finally, this dissertation ends with the sixth chapter, which highlights the overarching contributions for theory and practice of this dissertation. Limitations and avenues for further research are discussed, subsequently.

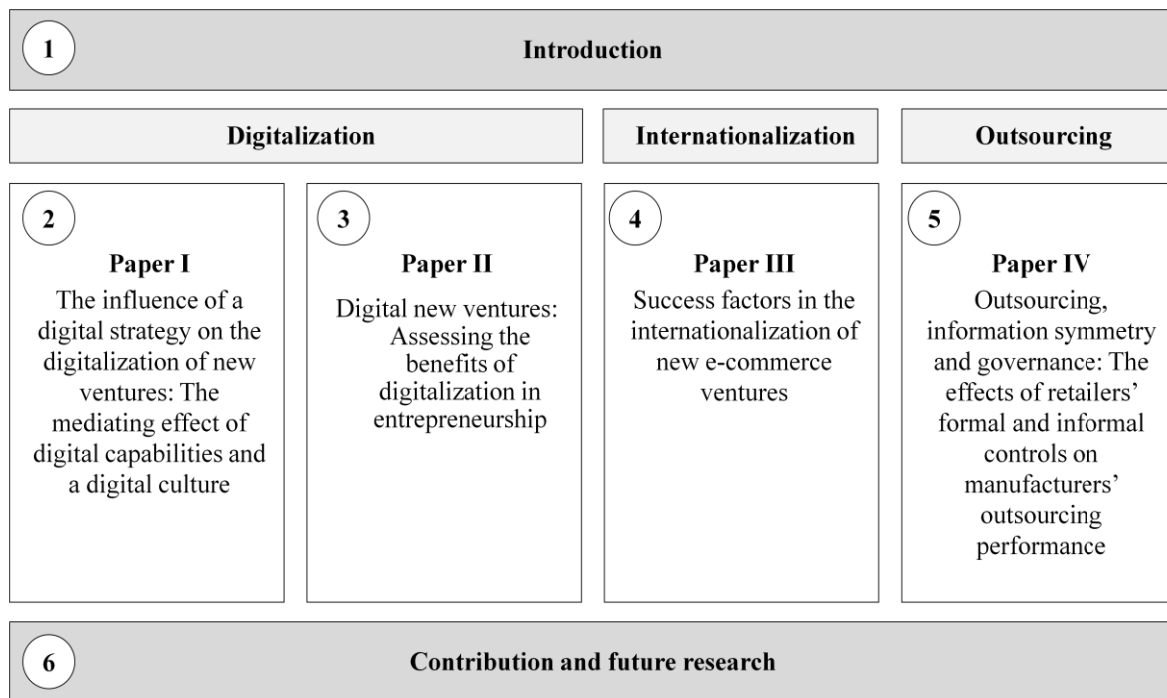


Figure 1: Chapter Overview

1.2 Summary of research papers

In the following, the four research papers comprising this cumulative dissertation are summarized. Research paper I to III are from the research field of digital entrepreneurship, including studies on digitalization and internationalization, while research paper IV refers to control mechanisms in outsourcing relationships. Thus, the four research papers provide a strategic view on different ways to derive competitive advantages for small, new and foreign firms.

The first research paper, entitled *The influence of a digital strategy on the digitalization of new ventures: The mediating effect of digital capabilities and a digital culture*, investigates the influence of a digital strategy on the degree of digitalization of new ventures. It further examines factors such as digital information technology (IT) capabilities, employees' digital capabilities, and a digital culture as mediators in this hypothesized relationship. The corporate literature has discussed a digital strategy as tool to influence firms' degree of digitalization (Bharadwaj et al., 2013; Sebastian, Ross, Beath, Mocker, Moloney, & Fonstad, 2017), because digitalization is assigned a variety of advantages such as higher customer satisfaction and loyalty through digital products/services or greater productivity and efficiency through digital processes

(Autio, 2017; Rachinger, Rauter, Müller, Vorraber, & Schirgi, 2018). However, the influence of a digital strategy on new ventures' degree of digitalization in terms of their products/services and processes has not been assessed in the strategic entrepreneurship literature. This paper contributes to fill existing research gaps by assessing the influence of a digital strategy on the digitalization of new ventures' products/services and processes, along with three mediators. The analysis is based on the contingency theory (Helfat, Finkelstein, Mitchell, Peteraf, Singh, Teece, & Winter, 2007; Symeonidou & Nicolaou, 2018; Van de Ven & Drazin, 1984; Venkatraman & Camillus, 1984) and a sample of 102 German new ventures. To analyze the data structural equation modeling (SEM) in form of the partial least squares (PLS) approach is used. Findings show that simply having a digital strategy is not enough to realize a high degree of digitalization. The digitalization of products/services is partially mediated by digital IT capabilities, and the effect of digital strategy on process digitalization is fully mediated by digital IT capabilities and a digital culture. The results have several managerial and theoretical implications. From a theoretical lens, this paper provides empirical insights in the field of digital entrepreneurship and adds to the discussion on the importance of a digital strategy in a new context, the entrepreneurial environment (Bharadwaj et al., 2013; Sebastian et al., 2017). From a practical perspective, founders and co-founders can use the insights from this paper to prioritize investments in digital technologies to digitalize their processes. Moreover, corporate accelerators and corporate venturing initiatives can adjust their support of digital new ventures in their products/service offering by, for example, providing an IT infrastructure or helping to develop a digital culture.

The second research paper, *Digital new ventures: Assessing the benefits of digitalization in entrepreneurship*, investigates the influence of a stronger degree of digitalization in new ventures on potential benefits. While the corporate literature has assigned digitalization a variety of benefits, these advantages have not been shown empirically for entrepreneurial organizations (Devos et al., 2012; Obwegeser et al., 2016; Premkumar, 2003; Riemenschneider, Harrison, & Mykytyn, 2003). This research paper contributes to fill existing research gaps by testing hypotheses, which deal with the influence of a stronger degree of digitalization in new ventures on resource savings,

operational efficiency and flexibility. Implementing the resource-based view (RBV), this paper uses a survey with 102 new ventures to test three hypotheses. To do so, the new ventures were clustered in three groups according to their degree of digitalization (low, medium or high). Afterwards an analysis of variance (ANOVA) was used to compare the benefits of digitalization among these groups. Findings highlight, first, that a stronger degree of digitalization in new ventures does not result in direct resource savings, but, second, results in indirect savings through increased operational efficiency. Third, a stronger degree of digitalization leads to considerably greater market flexibility. These insights do not only provide a theoretical basis for understanding digitalization as a resource within the RBV, but also assist founder and founder support initiatives to decide on the potential return of investment in digitalization, given the benefits realized.

The third research paper is headed as *Success factors in the internationalization of new e-commerce ventures*. It examines success factors that are crucial for the international success of new e-commerce ventures. While the extant literature distinguishes between traditional and e-commerce new ventures in the internationalization process, the entry modes or the external factors affecting the internationalization (Abbad, Abbad, & Saleh, 2011; El Said & Galal-Edeen, 2009; Forsgren & Hagström, 2007; Grant & Bakhru, 2004; Grochal-Brejdak, 2018; Kim, 2003; Rialp, Rialp, & Knight, 2005; Wymbs, 2000; Yamin & Sinkovics, 2006), it lacks a distinction between traditional and new e-commerce ventures in terms of internal success factors in the internationalization. This distinction, however, is an important one as research has shown that there are significant differences with regards to, for example, the digitalization level, which influences marginal costs and, thus, the options for resource allocation (Grant & Bakhru, 2004; Hull et al., 2007). This paper contributes to fill existing research gaps by investigating the internal success factors for the internationalization of new e-commerce ventures. The qualitative study adopts an inductive, multiple-case study approach using ten new German e-commerce ventures, which are active in international markets. Data has been triangulated by referring to 18 semi-structured interviews as well as the company websites and other relevant online sources linked with the cases. Two findings emerge. On the one hand, results highlight the need to

distinguish between the internationalization of the front end (i.e., the “client side”) and the back end (i.e., the “server side”). On the other hand, findings indicate that some success factors are mainly relevant for the front end (internationally oriented founders and strong advertising capabilities), while other are more crucial for the back end (a diverse skill set within the team and a broad and reliable supplier network). However, some factors are relevant for both areas, such as market selection based on big data, internationally oriented investments, and an extensive use of digital technologies. Findings about the internal success factors in the internationalization of new e-commerce ventures add to the discussion how new e-commerce ventures can use internal resources to overcome the liabilities of smallness, newness and foreignness (Djupdal & Westhead, 2015; Fornes & Cardoza, 2015; George, 2005; Joensuu-Salo et al., 2018; Schweizer, 2012; Symeonidou, 2013; Zaheer, 1995; Zahra, 2005). In addition, the results from this paper help founders and co-founders to derive competitive advantages, which further contribute to improve the survival rate in the internationalization of new e-commerce ventures.

The fourth paper is named as *Outsourcing, information symmetry and governance: The effects of retailers’ formal and informal controls on manufacturers’ outsourcing performance*. It investigates the effects of retailers’ and boundary personnel’s control mechanisms on the outsourcing performance of small manufacturers. Outsourcing manufacturing bears a variety of risks such as quality and reliability issues or time and effort concerns (Hassan, Abdullah, & Razalli, 2016; Heshmati, 2003; Kotabe, Mol, & Murray, 2008). One way to mitigate these risks is the usage of organizational control mechanisms (Kang et al., 2014; Liu, Borman, & Gao, 2014). Nevertheless, a fine-grained understanding of the influence of control mechanisms on outsourcing performance is missing. This paper contributes to fill existing research gaps in this context and examines the effects of formal and informal controls on outsourcing efficiency and effectiveness. It further distinguishes between control mechanisms set by either the retailer or the representative person, known as the boundary person, and investigates the moderating impact of information symmetry in this framework. Based on the transaction cost economics (TCE) theory, the PLS approach is used to test five hypotheses. Therefore, data were collected from 230 small Indian manufacturers active

for two international retailers, who outsourced their production. Findings are manifold. First, results show that formal controls have a direct, positive effect on outsourcing efficiency, regardless whether they are set by retailers or boundary personnel. Second, while retailers' formal controls have an impact on effectiveness, boundary personnel's formal controls have no significant effect in this regard. Third, retailers' informal controls improve outsourcing effectiveness, but negatively affect efficiency. Fourth, the boundary person's informal controls lead to a decrease in efficiency, but an increase in effectiveness. Fifth, information symmetry is statistically significant in enhancing outsourcing efficiency and effectiveness. The findings of this paper contribute to the ongoing theoretical discussions of control mechanisms in outsourcing relationships (Holtgrave, Nienaber, & Ferreira, 2017; Lu et al., 2017) and provide a detailed understanding of the differences between control mechanisms set by either the retailer or the boundary personnel. In addition, results have significant practical implications as they help to improve manufacturer's outsourcing performance.

1.3 Presentation and Publication status of research papers

Table 1 provides an overview of the presentation and publication status of the four research papers which are included in this dissertation. All four papers were presented at different colloquia and/or conferences. In addition, research paper II is published in the Journal of Small Business Strategy and research paper IV is published in the Journal of Enterprise Information Management.

No.	Title	Authors	Publication information
1	The influence of a digital strategy on the digitalization of new ventures: The mediating effect of digital capabilities and a digital culture	Dorian Proksch, Anna Frieda Rosin, Stephan Stubner, Andreas Pinkwart	<ul style="list-style-type: none"> • Under review in Journal of Small Business Management (classified as "B" in VHB-JOURQUAL 3 ranking¹) • Presented at 22nd Annual Interdisciplinary Conference on Entrepreneurship, Innovation and SMEs - G-Forum (double blind peer reviewed), October

¹ The full list of the JOURQUAL 3 Ranking by the German Academic Association for Business Research (VHB) is available at www.vhbonline.org

			<p>10th – 12th, 2018, University of Hohenheim / Stuttgart Media University (Germany)</p> <ul style="list-style-type: none"> • Presented at Research Colloquium in Leipzig, July 5th, 2018, HHL Leipzig Graduate School of Management (Germany)
2	Digital new ventures: Assessing the benefits of digitalization in entrepreneurship	Anna Frieda Rosin, Dorian Proksch, Stephan Stubner, Andreas Pinkwart	<ul style="list-style-type: none"> • Published in Journal of Small Business Strategy, 2020, Vol. 30 No. 2, pp. 59-71 (classified as “C” in VHB-JOURQUAL 3 ranking) • Presented at 23rd Annual Interdisciplinary Conference on Entrepreneurship, Innovation and SMEs - G-Forum (double blind peer reviewed), September 25th – 27th, 2019, WU Vienna University of Economics (Austria) • Nominated for KSG Entrepreneurship Research Award 2019
3	Success factors in the internationalization of new e-commerce ventures	Anna Frieda Rosin	<ul style="list-style-type: none"> • Presented at Research Colloquium in Nuremberg, July 6th, 2017, Friedrich–Alexander University Erlangen–Nuremberg, Germany
4	Outsourcing, information symmetry and governance: The effects of retailers’ formal and informal controls on manufacturers’ outsourcing performance	Anna Frieda Rosin, Stephan Stubner, Sushil S. Chaurasia, Surabhi Verma	<ul style="list-style-type: none"> • Published in Journal of Enterprise Information Management, 2019, Vol. 32 No. 6, pp. 993-1014 (classified as “C” in VHB-JOURQUAL 3 ranking) • Presented at 79th Annual Meeting of the Academy of Management - AOM (double blind peer reviewed), August 9th-13th, 2019, Boston, Massachusetts, United States

Table 1: Overview Presentation and Publication Status of Research Papers

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2 Research Paper I

The influence of a digital strategy on the digitalization of new ventures: The mediating effect of digital capabilities and a digital culture

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Abstract

Digitalization can help new ventures generate competitive advantages through digital products/services or digital processes. Can a digital strategy increase new ventures' digitalization? To answer this research question, we analyzed 102 new ventures using SEM. We show that only having a digital strategy is insufficient to achieve a high degree of digitalization. The digitalization of products/services is partially mediated by digital IT capabilities, and the effect of digital strategy on process digitalization is fully mediated by digital IT capabilities and a digital culture. Corporate venturing initiatives can use these results to support new ventures, for example, by providing an IT infrastructure or encouraging a digital culture.²

2.1 Introduction

New ventures are typically confronted with strict resource constraints, making it essential to focus on a strategy that is able to deal with this limited amount of resources to remain competitive (Davidsson, Baker, & Senyard, 2017; Djupdal & Westhead, 2015; Hernández-Carrión, Camarero-Izquierdo, & Gutiérrez-Cillán, 2017; Steininger, 2019). Today, up to 90 percent of new ventures fail, while a big portion can be traced back to strategic failures (Gleeson, 2016). As a result, choosing the right strategy to decide how resources and capabilities are acquired, developed, and used to create value-adding products/services and to carry out optimal processes is imperative for new

² This research paper is under review in the Journal of Small Business Management. The formatting (including the style of headlines, tables, figures, etc.), the citation style and the structure are in line with the journal standards.

ventures' survival (Im & Workman, 2004; Kim, Im, & Slater, 2013; Srinivasan, Lilien, & Rangaswamy, 2002; Zhou, Yim, & Tse, 2005).

Recent research findings point towards an increasing importance of technology orientation as part of firm's strategy (Sirmon, Hitt, Arregle, & Campbell, 2010a; Symeonidou & Nicolaou, 2018). This has been addressed in the corporate literature, for example, in terms of a digital strategy, which intends to influence firms' degree of digitalization (Bharadwaj, Sawy, Pavlou, & Venkatraman, 2013; Sebastian et al., 2017). Digitalization, which describes the usage of digital technologies, enables firms to be successful with regard to, for example, higher customer satisfaction and loyalty through digital products/services or greater productivity and efficiency through digital processes (Autio, 2017; Rachinger, Rauter, Müller, Vorraber, & Schirgi, 2018). Consequently, increasing the degree of digitalization in the products/services as well as processes might be a viable measure for new ventures to develop competitive advantages (Nambisan, 2017; Rachinger et al., 2018; Steininger, 2019).

It is, thus, surprising that the importance of a digital strategy for new ventures' digital degree in terms of their products/services and processes has not been recognized so far by the strategic entrepreneurship literature. The extant research on established firms underlines the importance of digitalization as a part of firm's business strategy – rather than dealing with digitalization on a functional level (Sebastian et al., 2017). In addition, the entrepreneurship literature highlights the broad potential of digitalizing the products/services as well as processes of new ventures (Nambisan, 2017). However, the digital entrepreneurship literature has not investigated the specifics of a digital strategy on the degree of digitalization for new ventures. More specifically, research has neglected to investigate the impact of a digital strategy on new ventures' digital products/services and digital processes along with possible intervening factors (i.e., digital information technology capabilities [BarNir, Gallagher, & Auger, 2003; DeLone, Migliorati, & Vaia, 2018; Matt, Hess, & Benlian, 2015; Neus, Buder, & Galdino, 2017; Souza, Siqueira, & Reinhard, 2017], employees' digital capabilities [Nylen & Holmström, 2015; Parida, Sjödin, Lenka, & Wincent, 2015; Prokesch, 2017] and digital culture [Deuze, 2006; El Sawy, Kræmmergaard, Amsinck, & Vinther, 2016; Nylen & Holmström, 2015]). Based on the contingency theory (Helfat

et al., 2007; Symeonidou & Nicolaou, 2018; Van de Ven & Drazin, 1984; Venkatraman & Camillus, 1984) and a sample of 102 German new ventures, we contribute to fill this research gap by investigating the influence of a digital strategy on the digitalization of new ventures' products/services and processes. In addition, we examine factors such as digital information technology (IT) capabilities, employees' digital capabilities, and a digital culture as mediators in this potential relationship.

Our findings have several managerial and theoretical implications. From a managerial point of view, new ventures could benefit from an improved understanding of implementing a digital strategy and its consequences on digitalization in multiple ways. For instance, firms could leverage a digital strategy to produce new digital products and services, which create additional value for customers (Amit & Zott, 2001; Rachinger et al., 2018). Furthermore, new ventures could digitalize processes along the value chain creating also higher degrees of flexibility and efficiency (Amit & Zott, 2001; BarNir et al., 2003; Nambisan, 2017; Parviainen, Kääröäinen, Tihinen, & Teppola, 2017; Rachinger et al., 2018; Valdez-de-Leon, 2016). We further provide insights that emphasize digitalization as strategic imperative as well as highlight the most important levers for increasing the degree of digital products/services or digital processes in new ventures. This can help new ventures to stay competitive: on the one hand, because new ventures can use these insights to spend more resources on digital technologies to drive efficiency and cost savings; on the other hand, because corporate accelerators and corporate venturing initiatives can use the results to better support new digital ventures in their portfolio by, for example, providing an IT infrastructure or helping develop a digital culture.

Investigating this issue could, further, contribute to ongoing academic discussion in multiple ways. For instance, our research answers calls for research, first, from Ott, Eisenhardt, and Bingham's (2017) to study the role of strategy in the entrepreneurial context and, second, studies the intersection of digital technologies and entrepreneurship as suggested by several authors (Berger & Kuckertz, 2016; Berger, von Briel, Davidsson, & Kuckertz, 2018; Nambisan, 2017; Steininger, 2019). As such, this article provides empirical insights in the field of digital entrepreneurship and sheds light

on the currently under researched topic of a digital strategy in this field of research. We therefore add in forming the basis for future investigations (Steininger, 2019).

The remainder of this article is structured as follows. In the next section, we introduce our theoretical framework, which investigates the influence of a digital strategy on digital products/services as well as digital processes of new ventures. We further introduce our hypotheses to test for potential mediators in this relationship. Then, we describe the methodology of our empirical study as well as present and discuss the results. Finally, we highlight the implications and present our limitations.

2.2 Theory and hypotheses

2.2.1 Digital strategy and degree of digitalization

The increasing incorporation of digital technologies in firms' products as well as the rising customer demands with regard to the availability of digital services, results in difficulties to separate digitalization issues from firm's business strategy nowadays (El Sawy, 2003; Bharadwaj et al., 2013). Moreover, the growing usage of digital technologies give rise to new business opportunities which help firms to digitalize processes and, thus, enable an increased efficiency. Consequently, firms have to rethink their original concept of a business strategy and are required to adapt their strategic approach to keep pace with their competitors (Bharadwaj et al., 2013; Kiel, Arnold, Collisi, & Voigt, 2016). To capitalize on the benefits of these current developments, many established firms have incorporated a digital strategy (Sebastian et al., 2017).

A digital strategy can be conceptualized as an organizational strategy that leverages digital resources to generate differential value (Bharadwaj et al., 2013). Consequently, Sebastian et al. (2017, p. 198) define it as "a business strategy, inspired by the capabilities of powerful, readily accessible technologies ..., intent on delivering unique, integrated business capabilities in ways that are responsive to constantly changing market conditions." This overarching definition is different from related concepts, such as an IT strategy, which only focuses on the functional level in an organization and acts as an enabler of a particular business strategy (Bharadwaj et al., 2013). For firms that aim to be a successful part of the digital era, a digital strategy is one of the most relevant resources in order to incorporate digitalization in firms (Kim et al., 2013).

Digitalization describes “the application of digital technologies and infrastructures in business, economy, and society” (Autio, 2017, p. 1). It therefore includes the concept of digitization, which is the process of transferring data and information from an analog format to a digital format (Bleicher & Stanley, 2018; Yoo, Henfridsson, & Lyytinen, 2010). Digitalization enables firms to exploit digital opportunities as well as helps to enhance firms’ competitive behavior (Rachinger et al., 2018; Westerman, Calm ejane, Bonnet, Ferraris, & McAfee, 2011). A high degree of digitalization, thus, comes along with a variety of advantages such as the potential to offer unique digital offerings, rising flexibility, higher efficiency, improved exploitation of resources and decreased costs (Rachinger et al., 2018).

2.2.2 Digital products/services and digital processes of new ventures

In the entrepreneurship literature, digitalization appears mainly in terms of digital products/services offered by new ventures and incorporated digital processes (Hull, Hung, Hair, Perotti, & Demartino, 2007; Nambisan, 2017; Rachinger et al., 2018). Digital products/services of new ventures are defined as products and services that are made possible or enabled through digital technologies (Lyytinen, Yoo, & Boland, 2016; Porter & Heppelmann, 2014). In this regard, not only entirely new products but also digitally enhanced consumer products and add-on digital tools belong in this category (Hull et al., 2007; Lyytinen et al., 2016). Digital products/services can include any kind of digital element, media usage, or application as well as digital components that provide the product or service’s main functionality (Ekbia, 2009; Kallinikos, Aaltonen, & Marton, 2013; Nambisan, 2017). The entrepreneurship literature notes that the digitalization of products/services has a significant influence on the value creation of new ventures (Nambisan, 2017; Rachinger et al., 2018). For example, the application of digital technologies provides firms with the opportunity for greater product customization or a digital interaction with customers, which can ultimately result in greater customer satisfaction (Hull et al., 2007).

Digital processes are all activities that create value by means of digital technologies (BarNir et al., 2003; J arvinen & Karjaluoto, 2015; Kannan & Li, 2017; Wulf, Mettler, & Brenner, 2017). They provide digital architectures to create complementary offer-

ings (Nambisan, 2017). Thus, digital processes include, for example, the digital interaction with different stakeholders, digital distribution, digital operations or digital marketing (Hull et al., 2007). Digital processes are not limited to one specific part of the value chain; rather, they can be applied along the entire chain (Bogner, Voelklein, Schroedel, & Franke, 2016). A higher degree of digital processes enables, for example, more flexibility and allows for the automation of different actions such as digital selling, thus, increasing the efficiency of new ventures (BarNir et al., 2003; Hull et al., 2007; Li, Merenda, & Venkatachalam, 2009; Nambisan, 2017; Parviainen et al., 2017; Rachinger et al., 2018; Valdez-de-Leon, 2016).

2.2.3 Influence of a digital strategy on digitalization of products/services and processes

The extant literature already highlighted digitalization as important part of the strategic orientation of firms (Im & Workman, 2004; Kim et al., 2013; Srinivasan et al., 2002; Zhou et al., 2005). Kim et al. (2013) even emphasized that a digital strategy is one of the most relevant aspects in order to incorporate digitalization in firms (Kim et al., 2013).

In order to investigate the influence of a digital strategy on the degree of digitalization in terms of digital products/services and digital processes of new ventures and, thus, improving the performance in the domains of digitalization, we refer to the contingency theory. The theory emphasizes the importance of a firm's management to transform resources into capabilities to improve organizational performance (Helfat et al., 2007; Symeonidou & Nicolaou, 2018; Van de Ven & Drazin, 1984; Venkatraman & Camillus, 1984). This is because there is not a single best way that leads to organizational success, but a variety of internal and external contingencies have to be taken into account (Shepard & Hougland, 1978). The theory is preferred in strategy analysis over the resource-based view with respect to the alignment of resources and strategy relationships as well as value-adding capabilities (Chirico, Sirmon, Sciascia, & Mazzola, 2011; Gruber, Heinemann, Brettel, & Hungeling, 2010; Sirmon et al., 2010a; Sirmon, Hitt, Ireland, & Gilbert, 2010b).

Applied to the field of a digital strategy, the theory enables us to investigate the alignment of inter-organizational factors to improve the digital performance in two domains of new ventures: digital products/services and digital processes. Thus, a digital strategy set by the management of new ventures helps to align multiple organizational factors to increase the degree of digitalization in terms of digital products/services and digital processes (Donaldson, 2001; Symeonidou & Nicolaou, 2018; Van de Ven & Drazin, 1984; Venkatraman & Camillus, 1984).

Previous research on established firms that incorporate a digital strategy have been found to benefit from (1) enhanced digital products/services or developing completely new ones (Sebastian et al., 2017) and (2) improving internal work routines by developing digital processes (Bharadwaj et al., 2013; McConnell, 2015; Sebastian et al., 2017). We believe that the incorporation of digitalization in firm's business strategy is especially relevant in the field of entrepreneurship. This is mainly because in recent entrepreneurial business models the digitalization of products/services and processes can barely be separated from new ventures overall strategy (Bharadwaj et al., 2013). Thus, we suppose that incorporating a digital strategy in new ventures should have an effect on the digitalization of those firms in terms of digital products/services and digital processes too. This holds especially true, because new ventures are typically smaller and younger than established corporations, resulting in the fact that a strategy provided by the founders should be more easily adoptable (Kearney, Harrington, & Kelliher, 2019). We therefore hypothesize:

Hypothesis 1a *A digital strategy is effecting the degree of digitalization in new ventures digital products/services.*

Hypothesis 1b *A digital strategy is effecting the degree of digitalization in new ventures digital processes.*

Research on the contingency theory highlights that factors such as the organizational structure, the employees as well as the infrastructure of the firm are factors that need to be taken into account for a good managerial outcome (Shepard & Hougland, 1978). Thus, applying the contingency theory does further allow us to consider value adding capabilities such as digital IT capabilities, employees' digital capabilities, and

a digital culture as potential mediators in testing the influence of a digital strategy on the degree of digitalization in new ventures' products/services and processes (Symeonidou & Nicolaou, 2018).

2.2.4 Mediating role of digital IT capabilities

Despite the strategic orientation for new ventures' digitalization, digital IT capabilities have been found to influence the degree of digitalization in firms (BarNir et al., 2003; Matt et al., 2015; Neus et al., 2017; Souza et al., 2017). DeLone et al. (2018) define digital IT capabilities as the ability to use technological applications to create value for customers, suppliers, and the firm itself.

We assume that digital IT capabilities can support a digital strategy in increasing the degree of digitalization of new ventures' products/services because the necessary hardware and software, which is required for the development of the products/services, is more likely to be available when a new venture consist of the necessary digital IT capabilities (Denner, Püschel, & Röglinger, 2018). In addition, having digital IT capabilities allows firms to collect customer feedback through digital platforms to actively integrate customers' opinions within the progress of digitalizing products/services. As such, digital IT capabilities might be also supportive in enabling more rapid digital innovation which come alive in digital products/services (DeLone et al., 2018; Von Briel, Davidsson, & Recker, 2018). Furthermore, we suppose that the effect of a digital strategy on digital processes is strengthen by digital IT capabilities as new ventures need suitable digital IT capabilities to automate their processes (Berghaus, Back, & Kaltenrieder, 2017; Souza et al., 2017). This is because, digital IT capabilities enable new ventures to connect their IT with digital offerings, such as digital-payment, logistics and customer- or supplier-relationship management systems, which can lead to more flexible digital relations between a firm's internal and external resources and processes. Considering these positive effects of digital IT capabilities, we assume a mediating effect of digital IT capabilities on the relationship between a digital strategy and digital products/services as well as digital processes. Consequently, we hypothesize:

Hypothesis 2a *The relationship between digital strategy and digital products/services is mediated by the digital IT capabilities.*

Hypothesis 2b *The relationship between digital strategy and digital processes is mediated by the digital IT capabilities.*

2.2.5 Mediating role of employees` digital capabilities

In addition to the importance of a digital strategy, various researchers highlight the significance of employees` digital capabilities for new ventures` digitalization (Nylen & Holmström, 2015; Parida et al., 2015; Prokesch, 2017). Employees` digital capabilities reflect team members` ability to make use of digital technologies (Arkhipova & Bozzoli, 2018), resulting from digital experience and technical know-how (Bassellier, Reich, & Benbasat, 2001). For example, to make use of big data analytics, team members must be familiar with applications that allow them to store, process, and use a large volume of data to simulate scenarios, create networks, or build causal explanations (Arkhipova & Bozzoli, 2018). The results of such work can, for instance, be used to improve or to create innovative new digital products/services or processes (Ritter & Gemünden, 2004).

We therefore assume a mediating effect of employees` digital capabilities on the effect of a digital strategy on the digitalization of new ventures. Employees` digital capabilities include, for example, the ability to actively exchange information and documents through digital platforms, such as cloud services (Fischer & Reuber, 2011, 2014) as well as the capabilities to use digital channels (including mobile and social media) to integrate digital communication processes (BarNir et al., 2003). Thus, employees` digital capabilities might reinforce the effect of a digital strategy in terms of digital products/services and processes. This is supported by the fact that having a high degree of employees` digital capabilities enables employees to track processes in real time so that workflows become more transparent (Iivari, Ahokanga, Komi, Tihinen, & Valtanen, 2016). This allows for identification of processes that can be digitally improved or enhanced (Iivari et al., 2016; Knight & Cavusgil, 2004; Mazhelis et al., 2013). Thus, we anticipate a mediating effect of employees` digital capabilities between a digital strategy and the digitalization of new venture`s prod-

ucts/services and processes (Arkhipova & Bozzoli, 2018; BarNir et al., 2003; Neus et al., 2017; Nylén & Holmström, 2015). Therefore, we hypothesize:

Hypothesis 3a *The relationship between digital strategy and digital products/services is mediated by employees' digital capabilities.*

Hypothesis 3b *The relationship between digital strategy and digital processes is mediated by employees' digital capabilities.*

2.2.6 Mediating role of digital culture

Besides a digital strategy, the extant research emphasized the significant role of a company's digital culture in tapping the full potential of the digitalization in new ventures (Deuze, 2006; El Sawy et al., 2016; Nylén & Holmström, 2015). A digital culture is defined as "an emerging set of values, practices and expectations regarding the way people (should) act and interact within the contemporary network society" (Deuze, 2006, p. 1). A new venture's culture encompasses common behavioral rules that determine its identity (Cameron & Quinn, 2006; Punnett & Ricks, 1990).

We assume that a digital culture might enhance the effect of a digital strategy on the degree of digitalization in products/services and processes of new ventures as it helps to unfold the potential of a digital strategy. This hypothesis is supported by the fact that a digital culture also allows for flat hierarchies and decentralized decision making, which provide room for creativity and thereby creating opportunities for the development of digital products/services (McConnell, 2015; Nylén & Holmström, 2015). A digital culture generates new knowledge and increases inventiveness, thereby supporting the development of new products/services (Duerr, Holotiuk, Wagner, Beimborn, & Weitzel, 2018; Scheibe & Gupta, 2017). In addition, a digital culture leads to changes in the firm's behavior arising from the use of technology. This culture might include agile and flexible working styles, a digital-first mindset, an adaptive skill set that allows for failure when establishing digital abilities, and a focus on data, which might influence the degree of the digital processes in new ventures (El Sawy et al., 2016). Thus, we believe that a digital culture could mediate the relationship of a digital strategy and digital products/services as well as digital processes in new ventures, as it creates an environment in which team members are empowered to

make use of digital technologies (Deuze, 2006; Serrano, 2007). This leads us to hypothesize:

Hypothesis 4a *The relationship between digital strategy and digital products/services is mediated by digital culture.*

Hypothesis 4b *The relationship between digital strategy and digital processes is mediated by digital culture.*

Figure 2 shows our theoretical framework. In the following section, we test our hypotheses using this framework.

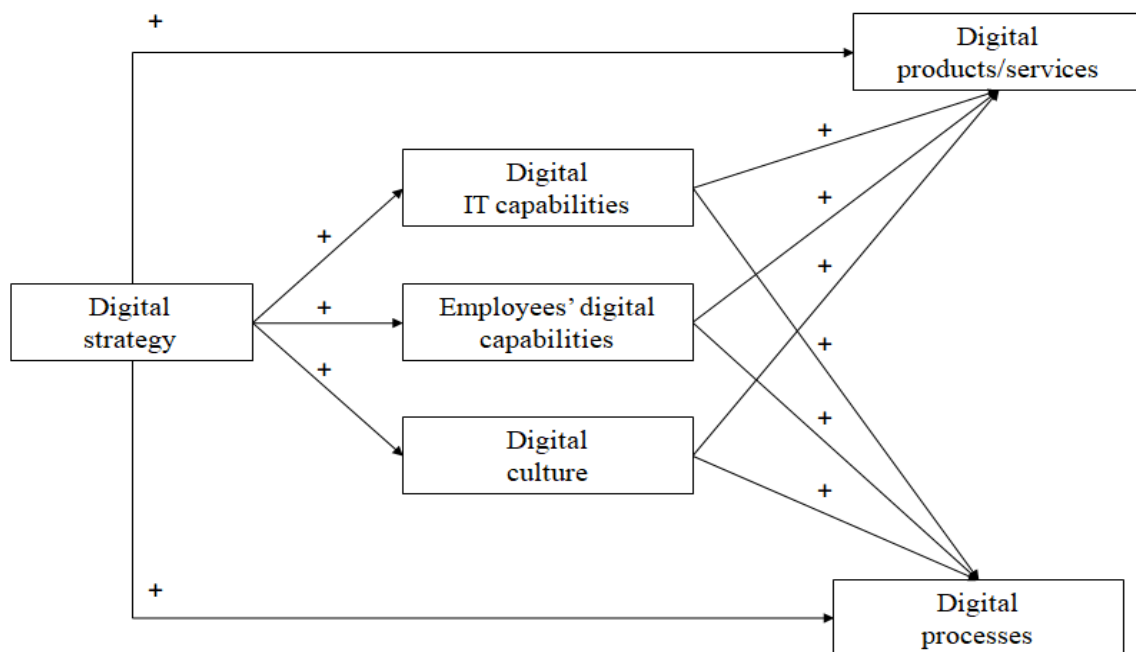


Figure 2: Theoretical Framework

2.3 Methodology

2.3.1 Data

Our study focuses on German new ventures. We define a new venture in this article as an organization that was established within the past ten years and offers an innovative product, service, or business model (Candi & Saemundson, 2008; Cunha, Silva, & Teixeira, 2013; Zahra, 1995). Focusing on new ventures in Germany while studying the digitalization of new ventures is important for several reasons. First, the capital of

Germany, Berlin, is often ranked as one of the most important cities for founders in the field of digitalization (for example seventh place globally in Startup Genome's "2017 Global Startup Ecosystem Report" and second place in Europe after London³; second place in the "Ranking of Europe's biggest startup cities" by EU-startups⁴; fourth place globally in Nestpick's "Startup City Index"⁵), which demonstrates the global relevance of the German entrepreneurial ecosystem. Second, new ventures in Germany receive 29 percent of Europe's venture-capital investments, which highlights the important role of German new ventures for European investors (KPMG, 2018). Third, two German firms active in the field of digitalization were among the top five new ventures in terms of venture capital investments in Europe in Q1 2018⁶: Auto1 Group (US\$460 million) and N26 (US\$160 million), which shows the global relevance of digital new ventures from Germany.

We collected our data through an open-source online survey tool from May 2018 until November 2018 using a snowballing sampling technique. We chose this technique because the true population of digital new ventures in Germany is unknown. Snowballing is an effective method to build a homogeneous sample for hard-to-reach populations (Khelil, 2016; Neergaard, 2007). Furthermore, snowball sampling is a common approach in entrepreneurship research (Collewaert & Sapienza, 2014; Fischer & Reuber, 2014; Gruber, Kim, & Brinckmann, 2015; Khelil, 2016; Kuhn & Galloway, 2015; Singh, Corner, & Pavlovich, 2015; Thompson, Purdy, & Ventresca, 2018; Verver & Koning, 2018; Welter, Xheneti, & Smallbone, 2018).

For the data collection we recruited participants at two entrepreneurship conferences as well as shared the survey link with entrepreneurs within a university network whose private business school had many alumni who had started digital businesses as well as has his own accelerator. Thus, these were effective methods to acquire respondents for our survey. We asked respondents to refer us to other potential participants. We explicitly did not focus on a particular industry because we used a multi-

³ See <https://startupgenome.com/report2017/>. Accessed on January 6th, 2019

⁴ See <http://www.eu-startups.com/2017/10/top-15-europes-biggest-startup-hubs-in-2017/>. Accessed on January 6th, 2019

⁵ See <https://www.nestpick.com/best-cities-for-startup-employees/>. Accessed on January 6th, 2019

⁶ See <https://www.crunchbase.com/organization/auto1-group#section-funding-rounds>, accessed on January 6th, 2019, and https://www.crunchbase.com/organization/number26/funding_rounds/funding_rounds_list. Accessed on January 6th, 2019

construct approach to measure digitalization; for example, a software company might offer only digital products/services but might not have digitalized the processes internally, and a pharmaceutical company might offer a non-digital product but have a high degree in the digitalization of internal processes.

In total, we collected 116 responses. We stopped the collection period when subsequent respondents began referring us to founders who already participated in our survey. At the end, we removed responses from 14 organizations from our final calculation, ten of which were not headquartered in Germany and four of which were older than ten years. Therefore, our final model contains 102 cases. With regard to position in the organization, 70.6 percent of the respondents were members of the founding team, 15.7 percent were members of the management team, and 13.7 percent were employees. The majority of the respondents were aged 25–34 years (59.8 percent) and 35–44 years (24.5 percent); nine respondents were older, and seven were younger. Most of the respondents had a business/economics background (61 participants), 11 had an IT background, four an engineering background, six a life science background, eight a social science background, one a law background, and 11 respondents other backgrounds. We established a balanced data set in the sense of snowball sampling: on the self-assessment of how digital the company is on a Likert scale from one (“not digital at all”) to five (“completely digital”), 45 participants responded with four, which is also the median; the average is 3.9; 31 respondents selected five, and 26 respondents chose less than four. This variation shows that the degree of digitalization of the ventures is high within our data set with still keeping enough variance for statistical analysis.

To establish a high reliability in creating our model, we conducted an approach adapted from Davidsson et al. (2017). First, the four authors of our article refined the items identified in literature. We had two experts in the author’s team: one of the authors is a successful digital entrepreneur and a frequent investor in digital businesses and one of the authors is minister of digitalization on state level. Then, we discussed the survey questions with four researchers in the field outside the author team and adapted them based on their feedback. Thereby, we focused especially on improving the understandability of the questions and items. In the next step, we conducted two

pretests involving a total of 17 participants, in which we asked the participants specifically to provide feedback to the survey questions and adapted our survey accordingly. This process identified several items that were more appropriate for established firms than for new ventures. We iteratively changed the respective items. Further, we looked for outliers in our constructs that might have been caused by misunderstanding and refined these items accordingly.

After the two pretests, we conducted a pilot study with 24 participants in which we specifically looked for the reliability of the constructs and for significant items (Davidsson et al., 2017). At this point, the constructs exhibited high reliability; therefore, we decided to start the final data collection. The participants of the two pre-tests and the pilot study were excluded from the final data collection.

On average, the new ventures of our final data set were 3.4 years old (median: 3). Sixteen companies were in the idea or pre-seed round, 38 were in the seed round; 27 were in an additional financing round; 18 companies were in the expansion stage; and three were in the exit phase. The industry distribution was diverse, with participating organizations active in IT/consumer electronics (12 participants), consumer services (11 participants), and consumer commerce (nine participants), among others.

2.3.2 Method

We used variance-based structural equation modeling (SEM) to build and test our model. Because the digital strategy, the mediators, and the degree of digitalization for products/services as well as processes cannot be measured directly, we created constructs that included several items. We used SEM in the form of partial least squares (PLS), which has recently gained popularity in entrepreneurship, strategic management and general management research (Hair, Sarstedt, Ringle, & Mena, 2012b; Hernández-Carrión et al., 2017; Kuckertz & Prochotta, 2018; Shinnar, Giacomini, & Janssen, 2012; Siren, Kohtamäki, & Kuckertz, 2012; Weber, Bauke, & Raibulet, 2016). A PLS model consists of an outer model that includes the constructs and their items and an inner model that includes the constructs and their relations. We estimated the model parameters in three steps (Henseler, Ringle, & Sinkovics, 2009). First, the algorithm iteratively estimates the latent variable score (the score for each construct). Second,

the algorithm estimates the outer weights/loadings and path coefficients (using multivariate linear regression to estimate the latter). Third, the algorithm determines the location parameters.⁷

We have several reasons for choosing PLS. First, PLS is an effective method for explorative research aimed at creating new theories (Hair, Hult, Ringle, & Sarstedt, 2016). Our research can be considered explorative because models that measure the degree of digitalization of new ventures are currently missing in entrepreneurship research. Second, PLS models are desirable when the research goal is to explain the variance of the model (Hair, Sarstedt, Pieper, & Ringle, 2012a). In studying the influence of a digital strategy and as well as other factors that might have an effect on the degree of digitalization in terms of products/services and processes of new ventures, we try to maximize the R² values. Third, as we adapted scales to the entrepreneurial context, we cannot guarantee a normal distribution of our data; PLS can handle non-normally distributed data (Hair et al., 2016).

We calculated our model using SmartPLS software (version 3.2.7; Ringle, Wende, & Becker, 2015), using the default properties, that include a path weighting scheme, 300 maximum iterations, a stop criterion of 10⁻⁷, and initial outer weights of +1. As we adapted scales to measure the digital strategy, the mediators, and the digital products/services and digital processes, we used only reflective constructs.

2.3.3 Measures

To measure digital strategy, digital IT capabilities, digital employees' capabilities, digital culture, digital products/services, and digital processes we referred to different constructs identified in the literature. Appendix 1 lists all the items. We used five-point Likert scales for all items.

We measured the digital strategy using five items, which we adapted from the technology orientation literature (Chen, Tang, Jin, Xie, & Li, 2014; Hakala & Kohtamäki, 2011; Kim et al., 2013). The original construct measures the technology orientation with the company's strategy, and we tailored it to the field of digitalization and updat-

⁷ Refer to Hair *et al.* (2016) and Sarstedt *et al.* (2016) for a detailed description of the PLS method and its usage.

ed one item after the pretest. We asked, for example, about the role of digitalization and digital projects in the new venture's strategy.

To measure digital IT capabilities we used seven items. The original construct was based on an adaptation of items measuring information and communication technology capabilities (Chen, Wang, Nevo, Benitez-Amado, & Kou, 2015; Parida & Örtqvist, 2015; Wales, Patel, Parida, & Kreiser, 2013) and digital platform capabilities (Cenamora, Parida, & Wincent, 2019). We adapted the items during the pretests to fit the context of new ventures. For example, we asked about the IT department's abilities to quickly implement digital offerings, integrate other digital offerings, and offer digital devices to team members.

We measured employees' digital capabilities using five items. The original construct was based on an adaptation of items from the technological competence and expertise construct (Knight & Cavusgil, 2004; Ritter & Gemünden, 2004) as well as the IT competencies construct and its adoptions (Bassellier et al., 2001). We updated the items during the pretest to tailor them to the unique human resources conditions in new ventures. For example, we asked about the importance of digital skills in the hiring process and about the ability and willingness of the team to digitalize further.

We measured digital culture using five items based on the construct of adhocracy culture by Lukas, Whitwell, and Heide (2013) and the findings of Duerr et al. (2018), although we included only items applicable to new ventures. We updated the items during the pretest to adapt them to the culture of new ventures. For instance, we asked about elements indicating a culture conducive to further digitalization, including the tolerance of failure, the presence of flat hierarchies, and the implementation of new work initiatives.

We measured the digitalization of the product and services relying on the constructs of innovation implementation (McAdam, Moffett, Hazlett, & Shevlin, 2010), technological innovation (Tang & Murphy, 2012), and innovation radicalness (Marvel & Lumpkin, 2007). We extensively updated the items after the pretest. We asked respondents about such aspects as the degree of digitalization of the products and services. We also asked them to provide information on customer integration in the development process.

We initially measured digitalization of processes using items from the constructs of business process digitization (BarNir et al., 2003; Bengtsson, Boter, & Vanyushyn, 2007), new process creativity (Rindfleisch & Moorman, 2001) and the findings of Markus and Loebbecke (2013). However, we strongly revised the construct according to pretest feedback. We asked, for example, about how often the new venture used digital technology to support standard processes, whether decision making was supported by data analytics, and whether digital channels were used to integrate processes.

2.3.4 Control variables

We included several control variables in our study. First, we included the age of the new venture as a control, as it is one of the most common control variables in entrepreneurship and digitalization research (see BarNir et al., 2003; Sarangee & Echambadi, 2014; Siren et al., 2012). Younger ventures might be able to start with a more current IT infrastructure that enables the use of digital services. Second, we included the investment round because in a later stage, scaling the business is typically a high priority. For scaling purposes, digitalization might become more important. Third, participants were asked to specify the new venture's industry. A new venture active in the field of IT might be more inclined to adopt digital technologies than a new venture in, for instance, the drug-development field.

2.4 Results

To investigate the influence of a digital strategy on the degree of digitalization of products/services as well as processes of new ventures and to check for the mediating effects of digital IT capabilities, employees' digital capabilities and digital culture, we first assessed the validity of our constructs. To do so, we iteratively removed items with loadings of less than 0.4 following Hair et al.'s (2016) guidelines. We removed one item from the digital IT capabilities construct, two from the employees' digital capabilities construct, and one from the digital culture construct. We had already reached the threshold for composite reliability and average variance extracted (AVE); therefore, we did not remove indicators with a loading below 0.7 (Hair et al., 2016). In

addition, we removed one item from the digital IT capabilities construct and one item from the digital strategy construct to increase the discriminant validity. We did not remove any items from the digital products/services or digital processes construct. Table 2 shows the loadings and p-values of the remaining items based on 5,000 bootstrapping rounds. All of our items except one had 99.9 percent significance⁸; the remaining one had 99.5 percent significance.

Item	Digital Strategy	Digital IT Capabilities	Employees' Digital Capabilities	Digital Culture	Digital Products/ Services	Digital Processes
Strategy 1	0.812***					
Strategy 2	0.836***					
Strategy 3	0.905***					
Strategy 4	0.882***					
IT 1		0.760***				
IT 3		0.810***				
IT 4		0.786***				
IT 6		0.535***				
Employee 2			0.830***			
Employee 4			0.821***			
Employee 5			0.849***			
Culture 1				0.722***		
Culture 2				0.595*		
Culture 3				0.789***		
Culture 5				0.784***		
Product/Serv. 1					0.865***	
Product/Serv. 2					0.731***	
Product/Serv. 3					0.823***	
Product/Serv. 4					0.784***	
Product/Serv. 5					0.793***	

⁸ The descriptive statistics for the items are available in Appendix 2.

Processes 1	0.819***
Processes 2	0.766***
Processes 3	0.904***
Processes 4	0.818***
Processes 5	0.784***

Note: unstandardized β s; † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 2: Factor Loadings and p -Values of the Used Items in our Model

In addition, we assessed the reliability of our constructs using Cronbach’s alpha, composite reliability, and the AVE (see Table 3 for results). We used a threshold of 0.7 for Cronbach’s alpha (Hair et al., 2016), and all of our constructs exceeded this value. In addition, all constructs exceeded the composite reliability threshold of 0.7 as well as the AVE threshold of 0.5 (Hair et al., 2016). We conclude that, in general, our constructs are reliable. Although the employees’ digital capabilities construct includes only three valid items, we decided to include it due to the explorative nature of our model.

Construct	Cronbach's Alpha	Composite Reliability	AVE
Digital Strategy	0.882	0.919	0.739
Digital IT Capabilities	0.703	0.818	0.534
Employees’ Digital Capabilities	0.781	0.872	0.695
Digital Culture	0.715	0.816	0.528
Digital Products/Services	0.859	0.899	0.641
Digital Processes	0.878	0.911	0.672

Table 3: Reliability Criteria for the Constructs

Table 4 shows the path coefficients, effect sizes, and R^2 values for our model. The R^2 values are high for the processes and products/services constructs, as both exceed the 0.5 threshold (Hair et al., 2016).

	Digital IT Capabilities			Employees' Digital Capabilities			Digital Culture			Digital Products/Services			Digital Processes		
	β	f^2	p	β	f^2	p	β	f^2	p	β	f^2	p	β	f^2	p
Digital Strategy	0.673	0.828	<0.001	0.667	0.801	<0.001	0.359	0.148	<0.001	0.347	0.114	<0.001	0.193	0.036	0.114
Digital IT Capabilities										0.280	0.081	<0.01	0.491	0.255	<0.001
Employees' Digital Capabilities										0.106	0.010	0.329	-0.002	0.000	0.850
Digital Culture										0.145	0.030	<0.10	0.209	0.064	<0.05
R²			0.453			0.445			0.129			0.537			0.547

Note: β : coefficient, f^2 : effect size, p : significance

Table 4: Path Coefficients, Effect Sizes, p -values, and R^2 in our Model

First, we tested whether digital strategy explains the degree of digitalization of product and services. The effect of digital strategy is strong (*beta* of 0.347) and significant (99.9 level), therefore supporting H1a. When we include digital IT capabilities, employees' digital capabilities, and digital culture in the model, digital strategy and digital IT capabilities are significant, but employees' digital capabilities and digital culture are not. Therefore, the digital strategy is partially mediated by digital IT capabilities. We can confirm H2a, but we must reject H3a and H4a. Furthermore, the R^2 value is above 0.5, indicating that the degree of digital products/services is well explained by the digital strategy and digital IT capabilities.

Second, we tested whether digital strategy explains the degree of the digitalization of the new ventures' processes. The effect of digital strategy is strong (*beta* of 0.193) but not significant ($p=0.114$), thus we have to reject H1b. When we included digital IT capabilities, employees' digital capabilities, and digital culture in the model, we found digital strategy is not significant but that digital IT capabilities and digital culture are. We conclude that digital strategy is fully mediated by these two variables. We therefore can accept H2b and H4b, but we must reject H3b. Furthermore, a high R^2 value

(above 0.5) indicates that the degree of digital processes is well explained by digital IT capabilities and digital culture. In addition, a digital strategy can explain the digital IT capabilities, as evidenced by a high R^2 value of 0.453. However, the digital strategy does not explain the digital culture, as indicated by a low R^2 value of 0.129.

To better explain the role of digital IT capabilities, we created a descriptive statistic based on the degree of digitalization in products/services and processes. As PLS standardizes the latent variable score of all the constructs, we coded for each case if it ranks below or above the average of 0 and created a 2×2 matrix. We then looked at the average latent variable score for the digital IT capabilities in each field (see Figure 3). The companies having a high process digitalization but a low product digitalization score much higher in the digital IT capabilities than the companies for which the opposite holds true. This result strengthens our argument that high digital IT capabilities are necessary for a high degree of a process digitalization.

		Degree of Digitalization of Products/Services	
		Low	High
Degree of Digitalization Processes	Low	-0.947 (28)	0.087 (16)
	High	0.401 (12)	0.442 (46)

Figure 3: Latent Variable Score of the Digital IT Capabilities Construct Based on the Degree of Products/Services and Process Digitalization (n in parentheses)

With regard to the control variables, the age of the company as well as the investment round showed no significance, so we removed them from the model. Further, we extracted the latent variables scores of the constructs of the model. We used the scores to calculate a regression model with industry dummies for each industry with more

than seven mentions. For the construct digital products/services, none of the industry variables were significant. Although the industry dummy for “consumer service” was significant on 95 percent level for the variable digital processes with a positive coefficient, only 11 of our 102 cases belong to the industry. The other coefficients changed only slightly, suggesting that no other industries had an influence on the degree of digital processes.

To assess discriminant validity, we adopted the Fornell-Larcker criterion and the cross-loading approach. Both confirm discriminant validity (see Appendices 3.1.1 and 3.1.2). In addition, we used the heterotrait-monotrait ratio (HTMT). As this was an exploratory study, we used a threshold of 0.9 (Hair et al., 2016, p. 119). Our model also passed this test (see Appendix 3.1.3). Moreover, we checked for possible multicollinearity among our independent constructs. The low values for the variance inflation factors (VIFs) indicate that this is not an issue in our model (see Appendix 3.2.1). To test for a possible common method bias, we first referred to Kock’s (2015) method, which shows that a common method bias can be identified based on the VIFs of the constructs. He proposes regressing all constructs on a random variable and then calculating the resulting VIFs. He argues that the threshold for common method variance is a VIF higher than 3.3 (Kock, 2015; Kock & Lynn, 2012). In our sample, all VIFs are below this value (see Appendix 3.2.2). In addition, we used Harman’s single factor test (Podsakoff & Organ, 1986). We ran an explanatory factor analysis with one factor. The explained variance of this factor is 36 percent, well below the threshold of 50. Furthermore, we followed Rönkkö and Ylitalo’s (2011) marker variable approach, which involves adding a variable uncorrelated to the constructs of the model and then checking the average correlation with each item. The correlation will capture any common variance bias; if it is below 0.05, no bias exists. We chose an item measuring whether less office space is needed due to the digitalization of the new venture. The average correlation with the items in our mode is 0.001, confirming that our model does not exhibit common method bias.

Last, we controlled for possible endogeneity bias induced by reverse causality. In line with Hult et al. (2018), we first used the control variables as previously described. As we were unable to identify a potential bias with this method, we applied the Gauss-

ian copula approach (Park & Gupta, 2012). We first assessed the non-normality of our four independent constructs by running the Kolmogorov–Smirnov test with Lilliefors correction (Hult et al., 2018) to assess whether the Copula approach could be applied. All four independent variables are non-normally distributed. Then, we recalculated the two models including the copulas of our four enabler constructs. We could not identify an endogeneity problem in the models as none of the copulas were significant. We therefore conclude that our data do not suffer from a reverse causality issue.

2.5 Discussion

The focus of this article is investigating the relationship between a digital strategy and the degree of digitalization in new ventures in terms of digital products/services and digital processes. We looked at three mediators in this relationship: digital IT capabilities, employees' digital capabilities, and digital culture. In contrast to the extant literature highlighting that a digital strategy is a crucial enabler of digitalization (Bharadwaj et al., 2013; Wulf et al., 2017), we can only partly support this finding. Our results indicate that the digital strategy is particularly important as an enabler of digital products/services, but not in terms of digital processes.

Although the products and services offered by new ventures are mainly dependent on the founders of new ventures, our results show that the degree of the digitalization of the products/services offered is influenced by the digital strategy, which is most likely implemented by the founders as well. This finding is in line with previous research that highlights the importance of the founder in a new venture's success (Song, Podoyntsyna, Van Der Bij, & Halman, 2008). Having a digital product or service offered (for example providing an e-commerce platform) also leads to higher average sales growth rates, which derives a competitive advantage for new ventures (Abebe, 2014). This finding can be explained by the fact that a high degree of digitalization enables a high scalability of the products and services offered.

However, our investigations show that the digital strategy has no direct influence on digital processes. One explanation is that the founders tend to focus more on factors that are visible from outside and less on managing the internal processes, especially in the beginning. Although this approach might have its advantages in the early

stages, it can be a challenge when the new venture experiences fast growth. It can lead to inefficiencies and reduce the productivity. Our findings are partly inconsistent with previous research by BarNir et al. (2003), who underscored a direct relationship between the digitalization of processes and of strategy. This inconsistency might be due to a different focus of the study: 15 years ago, digitalization was mainly associated with the access to the internet and the underlying availability of information. Currently, however, access to the internet is available for almost every organization; thus, digitalization is about generating value by means of digital technologies, as discussed previously. BarNir et al.'s (2003) results should therefore be compared with ours only by considering the respective contexts of each study. This might also explain why BarNir et al. (2003) found an influence of firm age on the digitalization of processes, but in our study, age was not significant.

We identify digital IT capabilities as an important mediator of a high degree of digitalization in German new ventures. This result is in line with findings from the corporate literature indicating that digitalization is heavily dependent on an organization's IT infrastructure and digital capabilities (for example BarNir et al., 2003; Châlons & Dufft, 2017; Parida et al., 2015; Souza et al., 2017). Our construct contains information on whether IT is able to integrate third-party digital offerings (for example digital payments), whether all data are stored digitally, and whether the venture provides access to various digital devices. In all of these respects, strong IT support is key. On average, the ventures scored between three and four (on a one to five scale) in these categories with a standard deviation of about one, which indicates that notable differences exist among ventures in terms of the extent to which their digital IT capabilities are able to support digitalization efforts. As new ventures often have limited resources, a lack of IT resources might be problematic and potentially hinder fast digitalization and, therefore, the scaling of the business. Surprisingly, this is especially the case for the digitalization of processes: digital IT capabilities fully mediate them. Possibly, new digital ventures use their digital IT capabilities more on what is visible to investors and customers when IT resources are scarce: the digitalization of the products.

Employees' digital capabilities do not play a significant role as a mediator in our model. This marks a clear departure from findings in the corporate literature that highlight the need to develop employees' digital capabilities to successfully digitalize (Kane, Palmer, Phillips, & Kiron, 2017; Neus et al., 2017). That said, new ventures tend to have better access to skilled employees due to the network and experience of their founders (Zahra & George, 1999). Furthermore, Symeonidou and Nicolaou (2018) show that higher human capital investments compared with rivals do not necessarily lead to better company performance. The lack of a significant influence of employees' digital capabilities on digitalization in our model may also be explained by a self-selection bias. New ventures often employ relatively young people who are digital natives and, therefore, are likely to use digital products/services. Alternatively, they may include digital competencies in their hiring criteria. The latter factor scored on average of 4 out of 5 in our survey.

A digital culture is an important mediator for digital processes in new ventures, in line with current research (El Sawy et al., 2016). When beginning to digitalize manual processes, some tolerance of failure is necessary. The employees must be amenable to change, as digitalization makes it necessary to do things in new ways. In addition, the management of new ventures might focus more on product/service digitalization as they must show results to financial investors. A working product might be more important in the beginning than running an efficient business. Possibly, the digitalization of processes might be triggered by the employees themselves to make things easier for themselves—in a sense, making it an employee driven innovation process (Kesting & Ulhøi, 2010). Interestingly, digital culture cannot be explained by the digital strategy. A reason for that may be that new ventures often lack hierarchies in the beginning (Minguzzi & Passaro, 2001). Rather than enforcing decisions from the top, employees freely work on different projects. The management sets the goals for the product or service development and digitalization but does not tell the employees how to do it. They do not “construct” the digital culture but rather let it unfold (Hayton & Cacciotti, 2013).

2.6 Implications

Our work has several practical and theoretical implications. From a managerial perspective we can mainly derive four implications. First, we show, that a digital strategy is influencing the degree of digitalization of new ventures' products and services. Thus, founders who wish to increase the degree of digitalization of products and services, for example, to increase customer satisfaction, can focus on implementing a digital strategy in their new venture.

Second, we highlight that the effect of the digital strategy on the digitalization of processes is fully mediated by the digital IT capabilities. These findings can be used by founder-support initiatives, such as accelerators, by offering services and infrastructure for faster digitalization of new ventures. Especially in the early phases, new ventures might not have the resources needed to establish a sophisticated IT infrastructure in a way that supports further digitalization. This finding is also relevant for founders, who should adapt their strategy to use more resources on digital IT capabilities, as a high degree of digitalization in processes can lead to cost savings and greater efficiencies. However, we currently lack the understanding how digital IT capabilities for digital processes and digital products/services differ, and future research should further elaborate on it.

Third, we show that the influence of digital strategy on digital processes is mediated by a digital culture. Increasing digitalization carries a risk of failure, especially considering the solutions for some areas will be completely new. Therefore, a failure-tolerating culture—an element of the digital culture—can enhance digitalization. New ventures can actively engage in establishing such a culture. Furthermore, accelerators and founder-support initiatives can assist in this process. Surprisingly, the digital strategy does not explain the digital culture well. Future research should attempt to explain this effect. Currently, only limited empirical research addresses digital culture, especially with respect to strategic issues.

Fourth, our findings highlight that employees' digital capabilities have little relevance in our model. One reason might be that founders and their employees tend to be digital natives. However, in the growth phase, new ventures might hire employees from different generations. In that case, it might be useful to offer them digitalization-

related training. Future research should use our findings to further elaborate the importance of employees' digital capabilities.

From a theoretical perspective, our study delivers empirical evidence on the influence of a digital strategy on the degree of digitalization of products/services and processes. We followed Ott et al.'s (2017) calls for research to explicitly study the role of strategy in the entrepreneurial context as well as of Steiniger (2018) to contribute to the research of combining digital technologies and entrepreneurship. In addition, we contribute to the literature by emphasizing the appropriateness of using the contingency theory for strategic issues in entrepreneurship (Gruber et al., 2010). We emphasize the important role of a digital strategy in the digitalization of products/services. In this regard, we further show how internal contingencies can result in organizational outcomes. We highlight that digital IT capabilities as well as a digital culture influence the degree of digitalization in terms of products/services and processes in new ventures, which is assigned a variety of benefits. However, future research is needed to determine how the degree of digitalization affects new ventures' output and performance. Thus, we contributed to form the theoretical basis for future investigations.

2.7 Limitations

Our study contributes to the developing research field of digital entrepreneurship and aimed to study the influence of a digital strategy on the digitalization of new ventures by using existing theory. Our study has two main limitations that should be addressed in future research.

First, we used entrepreneurs' self-assessments to study the degree of digitalization of new ventures, which could be positively biased. In other words, entrepreneurs might be more inclined to create a positive image of their venture, especially as a high degree of digitalization often has a positive connotation in the media. However, before distributing the survey, we clearly stated that the data would be kept anonymous, which should have reduced participants' motivation to exaggerate the degree of digitalization. In addition, we did not inform participants that we were studying the interconnections between a digital strategy and the digitalization of new ventures. Furthermore, we tested for common method variance and found no statistical issues.

Second, we focused on the digitalization of new ventures in Germany. Whether the results can be generalized to other countries, especially countries with a much higher or lower digitalization index,⁹ is unclear. However, the results for other European countries, including the United Kingdom and France, might be similar due to the similarities in the entrepreneurial infrastructures in these countries.

⁹ See, for example, Chakravorti, Bhalla, and Chaturvedi (2017) for a cross-country comparison of digital competitiveness.

2.8 References

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Appendices

Appendix 1: List of survey items

Digital strategy: Please rate whether the following statements apply to your company on a scale from 1. strongly disagree to 5. strongly agree.

1. Digitalization is among the top 3 most important elements of our business strategy.
2. We investigate the newest trends and future scenarios in digitalization to stay competitive.
3. Digital projects have a high priority within our business.
4. We constantly update and refine our digital strategy.
5. Our competition as well as industry experts perceive us as a leader in digital innovation.

Digital IT capabilities: Please rate whether the following statements apply to your company on a scale from 1. strongly disagree to 5. strongly agree.

1. We adapt our digital offerings whenever changing business needs arise.
2. We implement new digital products and services on a regular basis.
3. Our IT integrates the most current digital offerings by third parties like digital payments, customer relationship management systems and others.
4. Our company provides access to a variety of digital devices.
5. We use the most current IT infrastructure.
6. We store all data digitally.
7. We have Internet access with gigabit speed.

Employees' digital capabilities: Please rate whether the following statements apply to your company on a scale from 1. strongly disagree to 5. strongly agree.

1. We offer different trainings (e.g. courses, literature, coaching) to improve the digital expertise of our team members.
2. Digital skills are an important selection criterion in recruiting new team members.
3. Our team members use all digital services and products we offer.
4. Our team has the necessary skills to further digitalize our company.
5. We actively discuss our digital projects within our company including failures and best practices.

Digital culture: Please rate how often you experience the following cultural influences ranging from 1. never to 5. always.

1. We openly discuss failures with all team members.
2. Decisions are based on the opinion of the whole team, not on a single person only.
3. We work in cross-functional teams (e.g. combining people from IT, marketing, finance, etc.).
4. In our company, we avoid strong hierarchies in project work.
5. Every team member brings in ideas and suggestions for digital products and services.

Digital products/services: Please rate whether the following statements apply to your company on a scale from 1. strongly disagree to 5. strongly agree.

1. For the development of our products/services, we exploit all opportunities for digitalization in the market.

2. We successfully implemented new digital business ideas or business models within the last three years.
3. The degree of digitalization of our products and services is high compared to our competitors.
4. We actively integrate customers in the development of digital innovations.
5. We are able to quickly adapt our digital offerings based on customer feedback.

Digital processes: Please rate how often you refer to the following statements ranging from 1. never to 5. always.

1. We implement the most current digital channels (including mobile and social media) in our communication and service processes.
2. We define and control metrics and goals for our digital channels.
3. We improve our core processes with the support of digital technologies.
4. We use the most current digital technology to support standard processes.
5. We support our decision making by using data analytics.

Appendix 2: Descriptive Statistics

Item	Mean	Median	SD	Min	Max
Strategy 1	4.225	5	1.160	1	5
Strategy 2	4.118	4	0.937	1	5
Strategy 3	4.196	5	1.081	1	5
Strategy 4	3.814	4	1.078	1	5
Strategy 5	3.490	4	1.150	1	5
IT 1	4.049	4	0.883	1	5
IT 2	3.853	4	1.028	1	5
IT 3	3.588	4	1.056	1	5
IT 4	3.804	4	1.005	1	5
IT 5	3.755	4	1.057	1	5
IT 6	4.127	4	1.059	1	5
IT 7	3.539	4	1.310	1	5
Employee 1	3.059	3	1.070	1	5
Employee 2	3.990	4	0.949	1	5
Employee 3	3.755	4	0.959	1	5
Employee 4	4.049	4	0.825	2	5
Employee 5	4.245	4	0.917	1	5

Culture 1	3.990	4	0.850	2	5
Culture 2	3.755	4	0.814	2	5
Culture 3	3.971	4	0.906	2	5
Culture 4	4.039	4	0.964	1	5
Culture 5	4.108	4	1.004	1	5
Product/Service 1	3.775	4	0.943	1	5
Product/Service 2	3.843	4	1.217	1	5
Product/Service 3	3.745	4	1.123	1	5
Product/Service 4	3.706	4	1.104	1	5
Product/Service 5	3.824	4	1.112	1	5
Processes 1	4.039	4	0.878	1	5
Processes 2	3.765	4	1.064	1	5
Processes 3	3.902	4	1.020	1	5
Processes 4	3.902	4	0.990	1	5
Processes 5	3.745	4	1.096	1	5

Appendix 3.1.1: Cross Loadings

	Digital Strategy	Digital IT Capabilities	Employees' Digital Capabilities	Digital Culture	Digital Products/ Services	Digital Processes
STRAT1	0.812	0.477	0.503	0.224	0.517	0.350
STRAT2	0.836	0.639	0.595	0.337	0.513	0.483
STRAT3	0.905	0.576	0.633	0.384	0.638	0.599
STRAT4	0.882	0.610	0.550	0.271	0.586	0.542
ITCAP1	0.537	0.760	0.524	0.369	0.490	0.562
ITCAP3	0.552	0.810	0.408	0.322	0.474	0.478
ITCAP4	0.570	0.786	0.539	0.359	0.585	0.542
ITCAP6	0.240	0.535	0.274	0.267	0.283	0.480
EMPCAP2	0.592	0.508	0.830	0.387	0.527	0.463
EMPCAP4	0.493	0.512	0.821	0.514	0.494	0.428
EMPCAP5	0.579	0.515	0.849	0.496	0.451	0.416
CULT1	0.226	0.367	0.435	0.722	0.281	0.356
CULT2	0.085	0.222	0.298	0.595	0.183	0.162
CULT3	0.315	0.345	0.332	0.789	0.386	0.439
CULT5	0.326	0.355	0.532	0.784	0.402	0.375
PRODSER1	0.630	0.596	0.472	0.355	0.865	0.670
PRODSER2	0.523	0.416	0.427	0.277	0.731	0.541
PRODSER3	0.545	0.604	0.502	0.336	0.823	0.606
PRODSER4	0.456	0.411	0.511	0.446	0.784	0.477
PRODSER5	0.466	0.523	0.452	0.415	0.793	0.560
PROC1	0.483	0.639	0.454	0.469	0.577	0.819
PROC2	0.331	0.401	0.264	0.304	0.490	0.766
PROC3	0.551	0.619	0.476	0.437	0.670	0.904
PROC4	0.587	0.597	0.538	0.462	0.661	0.818
PROC5	0.379	0.571	0.352	0.283	0.506	0.784

Appendix 3.1.2: Fornell-Larcker Criterion

	Digital Strategy	Digital IT Capabilities	Employees' Digital Capabilities	Digital Culture	Digital Products/ Services	Digital Processes
Digital Strategy	0.859					
Digital IT Capabilities	0.673	0.731				
Employees' Digital Capabilities	0.667	0.614	0.834			
Digital Culture	0.359	0.453	0.555	0.727		
Digital Products/ Services	0.658	0.644	0.590	0.455	0.800	
Digital Processes	0.583	0.702	0.524	0.488	0.717	0.820

Appendix 3.1.3: Heterotrait-Monotrait Ratio

	Digital Strategy	Digital IT Capabilities	Employees' Digital Capabilities	Digital Culture	Digital Products/ Services	Digital Processes
Digital Strategy						
Digital IT Capabilities	0.825					
Employees' Digital Capabilities	0.797	0.810				
Digital Culture	0.402	0.624	0.732			
Digital Products/ Services	0.750	0.802	0.720	0.548		
Digital Processes	0.636	0.887	0.613	0.558	0.812	

Appendix 3.2.1: Collinearity Statistics for our Independent Constructs

	Digital Strategy	Digital IT Capabilities	Employees' Digital Capabilities	Digital Culture
VIF Value	2.281	2.092	2.353	1.507

Appendix 3.2.2: Collinearity Statistics for Regressing all Constructs on a Random Variable

	Digital Strategy	Digital IT Capabilities	Employees' Digital Capabilities	Digital Culture	Digital Products/ Services	Digital Processes
VIF Value	2.552	2.636	2.392	1.610	2.631	2.684

3 Research Paper II

Digital new ventures: Assessing the benefits of digitalization in entrepreneurship

Anna Frieda Rosin, Dorian Proksch, Stephan Stubner, Andreas Pinkwart

Abstract

New ventures must rigorously manage their resources because they suffer from the liabilities of newness and smallness. Digitalization, traditionally associated with resource savings, higher operational efficiency and more flexibility, implies great benefits for new ventures; however, this effect has not been empirically proven. Implementing the resource-based view, this article uses a survey with 102 new ventures to investigate how new ventures benefit from digitalization. We clustered the new ventures in three groups according to their degree of digitalization (low, medium or high) and conducted an analysis of variance to compare the benefits of digitalization among these groups. Our results show that a higher degree of digitalization in new ventures does not result in direct resource savings such as decreased human capital or office space needed; rather, it results in indirect savings through increased operational efficiency. It also leads to considerably greater market flexibility. Our findings assist founder and founder support initiatives in evaluating the necessity of investing in digitalization given the benefits realized.¹⁰

¹⁰ This research paper is published in the Journal of Small Business Strategy, 2020, Vol. 30 No. 2, pp. 59-71. The full paper can be found here:
<https://libjournals.mtsu.edu/index.php/jsbs/article/view/1543/1169>

4 Research Paper III

Success factors in the internationalization of new e-commerce ventures

Anna Frieda Rosin

Abstract

Many new e-commerce ventures fail in their internationalization attempts because entering foreign markets requires certain resources that new ventures often do not possess due to their liabilities of newness, smallness, and foreignness. Given these constraints, new e-commerce ventures need to optimize their resource allocation to ensure international success. I examine success factors in the internationalization of new e-commerce ventures. My study adopts an inductive, multiple-case study approach using data on new German e-commerce ventures. Findings show that a distinction must be made between the internationalization of the front end (i.e., the “client side”) and the back end (i.e., the “server side”). In addition, I find that certain success factors are primarily relevant for either the front end or the back end, while others are relevant for both. An understanding of success factors in the internationalization of new e-commerce ventures has significant implications for ventures hoping to be successful internationally.

4.1 Introduction

New ventures need to grow in order to survive in the long run (Gilbert, McDougall, & Audretsch, 2006). A common strategic option aimed at growth is entry into new, international markets. In fact, the internationalization of new ventures is a key driver of their competitiveness (Joensuu-Salo, Sorama, Viljamaa, & Varamäki, 2018; Schweizer, 2014; Yu & Si, 2012). However, many new ventures fail in their efforts to internationalize, thereby jeopardizing their financial stability and, frequently, their survival (Nummela, Saarenketo, & Sharon, 2014). While internationalization requires a bundle of specific resources, new ventures have limited resources and face several constraints, such as liabilities of newness (Djupdal & Westhead, 2015; Stinchcombe, 1965), smallness (Djupdal & Westhead, 2015; Zott, 2003), and foreignness (Fornes &

Cardoza, 2015; Zaheer, 1995). Thus, their young age, small size, and inexperience in foreign markets (Fornes & Cardoza, 2015; Joensuu-Salo et al., 2018; George, 2005; Schweizer, 2012; Symeonidou, 2013; Zaheer, 1995; Zahra, 2005) limit the resources that new ventures can invest in internationalization and increase their likelihood of failure (Nummela et al., 2014).

To manage the tradeoffs between resource constraints and the desire to internationalize, new ventures must optimize resource allocations to overcome their liabilities of newness, smallness, and foreignness and achieve international success. The extant research highlights a variety of internal success factors for the internationalization of new ventures, such as human capital (Acedo & Jones, 2007; Baum & Locke, 2004; Ensley, Pearson, & Amason, 2002; Ruzzier, Antoncic, Hisrich, & Konecnik, 2007), marketing capabilities (Evers, Andersson, & Hannibal, 2012), distribution channels (Gabrielsson and Gabrielsson, 2011), networks (Kiss & Danis, 2010), financial management (Bollingtoft, Ulhoi, Madsen, & Neergaard, 2003; Gabrielsson, Sasi, & Darling, 2004), internationalization strategies (Ripollés, Blesa, & Monferrer, 2012; Zhang & Dai, 2013), and the use of digital technologies (Zhang, Sarker, & Sarker, 2013).

The extant literature also identifies significant differences between traditional and online ventures when it comes to internationalization in terms of entry modes (e.g., time and market selection), the internationalization process itself, and external factors, such as trade barriers or digitalization (Abbad, Abbad, & Saleh, 2011; El Said & Galal-Edeen, 2009; Forsgren & Hagström, 2007; Grant & Bakhru, 2004; Grochal-Brejdak & Szymura-Tyc, 2018; Kim, 2003; Rialp, Rialp, & Knight, 2005; Wymbbs, 2000; Yamin & Sinkovics, 2006). However, to the best of my knowledge, the literature does not distinguish between different types of new ventures, such as traditional or online ventures, when looking at internal success factors for internationalization. This is surprising, as research has highlighted the significant potential of digitalization as a game-changer for businesses around the world (Maaradj, 2009; Parviainen, Kääroäinen, Tihinen, & Teppola, 2017). This is particularly relevant for new online ventures, which are characterized by a higher degree of digitalization (Grant & Bakhru, 2004; Hull, Hung, Hair, Perotti, & Demartino, 2007). Thus, as the

extant literature does not take the particularities of new online ventures into account, it does not offer clear insights into whether the internal success factors identified in the literature are also relevant for this type of new venture.

I examine internal success factors for the internationalization of new online ventures using the resource-based view (RBV). In order to do so, I adopt an inductive, multiple-case study approach in which I examine ten new German e-commerce ventures that are active in international markets. I triangulated my data by conducting semi-structured interviews with founders, co-founders, and employees from these ventures and by using secondary data, such as new ventures' web shops, company reports, and online articles. I chose new e-commerce ventures as representative of new online ventures because these ventures mainly sell products or services through Internet-based platforms (Grant & Bakhru, 2004; Stallmann & Wegner, 2015). They benefit from low marginal costs compared to the costs faced by other new producers, resulting in different options for resource allocation (Grant & Bakhru, 2004). This is particularly true when new e-commerce ventures deal with intangible products that are entirely digital, such as data services, tickets, software, or music (Grant & Bakhru, 2004).

My study provides an overview of factors that are key for the success of new e-commerce ventures as they internationalize. This understanding has significant implications for practitioners wishing to improve the internationalization of new e-commerce ventures. My findings can help founders, co-founders, and team members concentrate on the most important success factors in this context. Moreover, by minimizing the failure rate of these ventures, my results may have positive effects for the economy as a whole, as internationalizing new e-commerce ventures create jobs, generate exports, and drive innovativeness (Stawasz & Głodek, 2010).

I also contribute to existing theory by highlighting distinct success factors for new online ventures, thereby improving the framework of factors affecting international success. Furthermore, I add to discussions of the interactions between internal resources and new ventures' liabilities, such as the liabilities of newness, smallness, and foreignness. In addition, I highlight several avenues for further research on the internationalization of new e-commerce ventures.

The remainder of this article is structured as follows. In the next section, I provide a short overview of the current state of research by looking at the theoretical basis for my article, factors affecting the internationalization of new ventures in general, and types of new ventures. In particular, I introduce new e-commerce ventures. This is followed by a description of my methodology, after which I present and discuss the results of my inductive study as well as its implications and limitations.

4.2 Literature review

4.2.1 Theoretical background

New ventures typically suffer from liabilities of newness, smallness, and foreignness when entering foreign markets. Due to their young age, their processes are not yet well established. Moreover, when new ventures decide to internationalize, their strategies become more complex. They are required to develop additional processes and routines to handle the internationalization process, which can be difficult due to their liability of newness (Fernhaber & McDougall-Covin, 2014; Stinchcombe, 1965). The development and implementation of new routines and behaviors are also highly resource intensive, which is difficult for new ventures to handle, as they typically suffer from restricted resources due to their small size. Thus, as a result of the liability of smallness, any mistake may threaten the survival of new ventures (Fernhaber & McDougall-Covin, 2014; Zott, 2003). At the same time, the liability of foreignness associated with unfamiliarity with foreign markets, country-specific constraints, and the lack of legitimacy in those markets create numerous costs for new ventures, which they are often unable to cover due to their resource constraints (Fernhaber & McDougall-Covin, 2014; Zaheer, 1995). As a result of these liabilities, the international growth of new ventures is severely limited.

However, the literature highlights the importance of internationalization for new ventures' growth (Joensuu-Salo et al., 2018; Lu & Beamish, 2001; Murmann, Ozdemir, & Sardana, 2014). Internationalization is defined as a "gradual, incremental, or evolutionary process, with increasing involvement of firms in foreign markets" (Yu & Si, 2012, p. 525). It has been explained using such established theories as the stage theory of internationalization, which is also known as the Uppsala model. The Uppsala-

la model describes the internationalization of new ventures as an incremental process that starts with the business in the home market and then gradually expands to countries that are close to or similar to the home market (Johanson & Vahlne, 1977; Johanson & Wiedersheim-Paul, 1975). However, in recent years, research has begun to question the applicability of established theories of internationalization to new ventures (Forsgren & Hagström, 2007; McDougall, Shane, & Oviatt, 1994; Kiederich & Kraus, 2009; Kim, 2003). For example, Forsgren and Hagström (2007) find that many Internet-related firms do not use incremental stages when entering foreign markets. For these firms, international activity develops discontinuously and at a much faster pace, regardless of the physical distance between the home and host countries.

Consequently, the literature has attempted to explain the internationalization of new ventures using other approaches, such as the RBV, which is one of the most dominant perspectives in the entrepreneurship literature (Ekeledo & Sivakumar, 2004; Fornes & Cardoza, 2019; Hsu & Pereira, 2008; Joensuu-Salo et al., 2018). The RBV understands firms as bundles of “resources and evolving capabilities” (Madhok, Li, & Priem, 2010, p. 92) that are needed to generate economic returns (Penrose, 1959; Peteraf, 1993). Thus, it suggests that the acquisition, management, and exploitation of resources are responsible for a company’s performance, where “firm resources include all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm” (Barney, 1991, p. 101). Some researchers argue that knowledge creation, enlargement, and usage are responsible for a firm’s development and, hence, that these factors are key in the internationalization of new ventures (Autio, Sapienza, & Almeida, 2000; Debruelle & Maes, 2015; Ganotakis & Love, 2012; Yli-Renko, Autio, & Sapienza, 2001). The RBV offers a theoretical basis for investigating the internal success factors relevant for new e-commerce ventures.

4.2.2 Success factors for new ventures’ internationalization

The extant literature uses the RBV to explain success factors related to internationalization on the basis of firms’ capabilities (Hsu & Pereira, 2008; Joensuu-Salo et al., 2018). For instance, previous research has shown that in order to be successful in markets outside the home market, traditional new ventures need to be

able to identify new opportunities in foreign markets and capitalize on them by generating value through their internal resources (Gruenhagen, Sawang, Gordon, & Davidsson, 2018; Jarosinski & Mierzejewska, 2017; Joensuu-Salo et al., 2018).

As a result, the literature identifies a variety of internal factors affecting new ventures' internationalization success, such as human capital (Acedo & Jones, 2007; Ruzzier et al., 2007). In particular, the research stresses the importance of the new venture's founders and team as drivers of international success (McDougall, Oviatt, & Shrader, 2003; Oviatt & McDougall, 2005; Reuber & Fischer, 1997; Zahra, 2005). The founder's abilities to drive the venture towards internationalization depend on personal traits, such as alertness, mindset, prior work experience, and international experience. According to Oviatt and McDougall (1994), prior experience not only increases the likelihood of recognizing potential business opportunities and upcoming challenges, but also fosters networks and knowledge about foreign markets and industries. A new venture's team is also important for international activities (McDougall et al., 2003). For example, the team can support international export activities by providing market knowledge and experience that the founders lack (Beleska-Spasova, Glaister, & Stride, 2012; Luostarinen & Gabrielsson, 2006). In addition, new ventures' networks can help them acquire knowledge, identify customers, obtain research and development (R&D) support, and identify financing opportunities (Kiss & Danis, 2010; Nowinski & Rialp, 2013), all of which can lead to resource sharing and help new ventures overcome their lack of resources (Sekliuckiene & Maciulskaite, 2013).

Furthermore, research points to the role of the company's strategy in geographical expansion (Knight & Cavusgil, 2004; Rialp-Crido, Galván-Sánchez, & Suarez-Ortega, 2010; Ripollés et al., 2012; Zhang & Dai, 2013), although researchers do not agree on which strategy best fosters internationalization. Danik and Kowalik (2015) recommend that new ventures adopt a hybrid strategy instead of a cost-leadership or differentiation strategy. Gerschweski, Rose and Linsay (2015), on the other hand, show that the internationalization of new ventures is positively influenced by a differentiation strategy, while some of the born-global literature proposes that a niche strategy supports the rapid internationalization of young new ventures (Cannone & Ughetto, 2014).

Regardless of the chosen strategy, Rialp Criado et al. (2010) find that new ventures that wish to enter global markets should be able to constantly adapt to changing market conditions. In this regard, a variety of factors affecting new ventures' international success are discussed in research, including marketing capabilities (Evers et al., 2012), distribution channels (Gabrielsson & Gabrielsson, 2011), financial management (Gabrielsson et al. 2004), knowledge resources (Gassmann & Keupp, 2007; Nordman & Melén, 2008), and digital technologies (Zhang et al., 2013). However, as mentioned above, these success factors have not been specifically investigated for new online ventures (Gerschweski et al., 2015; Jarosinski & Mierzejewska, 2017). Looking into the success factors for new online ventures' internationalization, however, is important as those firms are able to allocate their resources differently than traditional new ventures due to lower marginal costs (Grant & Bakhru, 2004).

4.2.3 Traditional and online new ventures

A new venture is an organization that is founded by an entrepreneur who builds up an innovative business model that is scalable, repeatable, or profitable. In the initial years, new ventures are typically characterized by a significant increase in the number of employees and/or turnover (Klotz, Hmieleski, Bradley, & Busenitz, 2014; Yu & Si, 2012). The literature differentiates among different types of new ventures, including new traditional ventures and new online ventures, where the latter are also known as Internet-related firms, online start-ups, or e-businesses (Blagoeva Hazarbassanova, 2016; Grochal-Brejdak & Szymura-Tyc, 2018; Wentrup, 2016). Traditional and online new ventures mainly differ in terms of their degree of digitalization, which is lower for new traditional ventures than for new online ventures (Hull et al., 2007).

Digitalization is the use of digital technologies in different areas of life, such as society, business, and the economy (Autio, 2017). Digital technologies allow new ventures to develop digital products or services. Digitalized products and services are those that come alive or are enabled with the help of information technologies (IT) (Lyytinen, Yoo, & Boland Jr, 2016; Porter & Heppelmann, 2014). These technologies can also be used to digitalize processes in new ventures. Digital processes are activities that create value through the use of digital technologies (Järvinen &

Karjaluoto, 2015; Kannan & Li, 2017; Wulf, Mettler, & Brenner, 2017). Autio and Zander (2016) show that digitalization offers new prospects for the internationalization of new ventures by transforming the locus of practices and opportunities in entrepreneurship. They stress that digitalization in the context of internationalization provides new ventures with opportunities to expand, improve, and enrich boundary-spanning interactions with any stakeholder group, such as employees, customers, suppliers, or operative partners.

Digital technologies also allow new ventures to more easily operate across borders and at a significantly lower cost (Joensuu-Salo et al., 2018). This holds particularly true for new online ventures, as their business models are based on digital channels. Consequently, the continuous development of information and communication technologies supports their operations. At the same time, new online ventures must continuously adopt and exploit new technologies in order to derive competitive advantages. New e-commerce ventures are one type of new online venture.

4.2.4 New e-commerce ventures

New e-commerce ventures are Internet-based companies that focus on online sales and purchases of products and services. They represent “the sum of all digital initiation, negotiation and/or handling processes of commercial transactions between economic parties, which are realized via the internet” (Stallmann & Wegner, 2015, p. 6). Thus, the businesses of new e-commerce ventures can include all kinds of physical or digital products and services, which can be sold in different ways, such as through web shops, online marketplaces, auction platforms, or shopping clubs (Kadi & Peker, 2015). Differences in the nature of these ventures and that of new traditional ventures have been recognized by, among others, Feindt, Jeffcoate and Chappell (2002), who identify several factors that are critical for the growth of new e-commerce ventures. These factors include 1) website content (e.g., information on products/services), 2) the convenience and usability of the website, 3) the control of the operational processes, and 4) interactions with customers. In addition, these authors point to other success factors that are only relevant for new e-commerce ventures that are active in certain industries, such as: 5) community, 6) price sensitivity, 7) brand image, 8)

commitment, 9) partnership, 10) process improvements, and 11) integration. However, these authors do not distinguish between growth in home and foreign markets. As such, they do not focus on the internationalization of new e-commerce ventures.

Joensuu-Salo et al. (2018) find different performance drivers for new ventures active in the home market and in international markets, especially with respect to the influence of digitalization. However, despite the wide range of research on new e-commerce ventures in general, that literature rarely looks into the internationalization of those ventures (Grochal-Brejda & Szymura-Tyc, 2018). Most of the extant research examines external factors that support online sales (Abbad et al., 2011; El Said & Galal-Edeen, 2009; Javalgi, Martin, & Todd, 2004). There is also some literature, which focus on the mode of entry into markets outside the home market (Blagoeva Hazarbassanova, 2016; Grochal-Brejda & Szymura-Tyc, 2018; Wentrup 2016). However, to the best of my knowledge, no studies look at the internal factors that affect the international success of new e-commerce ventures. In order to begin filling this research gap, this study answers the following research question: What are the internal success factors for the internationalization of new e-commerce ventures?

4.3 Methodology

4.3.1 Method

In order to study success factors in the internationalization of new German e-commerce ventures, I adopted an inductive, multiple-case study approach in which I examined new German e-commerce ventures (Eisenhardt, 1989). This approach offers greater flexibility than a survey design or an experimental study. It also provides an opportunity to analyze a complex research phenomenon (Gehman, Glaser, Eisenhardt, Gioia, Langley, & Corley, 2018; Yin, 2016). Therefore, it is an appropriate method for investigating this issue, as it allows to examine pattern-matching properties between existing entrepreneurship research and cases (Neubert, 2018). Previous research has shown that three cases are enough to generate sufficient results (Eisenhardt, 1989). However, using multiple cases help to create more precise and generalizable findings (Gehman et al., 2018). To generate an understanding of the new e-commerce ventures, I first analyzed my cases. Thereafter, I looked for similarities and differences in the

success factors identified in each case. Afterwards, I looked for options how to group the identified success factors in accordance to the answers provided by the interviewees. When I found no additional changes in the success factors per group, I stopped my iterative process. This approach is common in entrepreneurship research (Neubert, 2018).

4.3.2 Sample and data collection

My sample consists of ten case studies. I chose my cases using a structured approach. More specifically, I focused on new e-commerce ventures that fulfilled the following criteria: (1) headquartered in Germany, (2) selling products through an own online shop, and (3) selling a significant share of products in markets outside Germany. Table 5 provides an overview of the selected cases.

Venture Name	Industry	Founding Year of Online Business	Headquarters
About You	Apparel	2013	Hamburg
Urbanara	Homeware	2010	Berlin
Junique	Art	2014	Berlin
Flaconi	Perfume	2011	Berlin
Fashionette	Designer bags	2008	Frankfurt am Main
Smow	Designer furniture	2008	Berlin
Futalis	Pet food	2011	Leipzig
Snooze Project	Mattresses	2015	Berlin
Purelei	Jewelry	2017	Mannheim
Mister Spex	Optician	2007	Berlin

Table 5: Overview of Selected E-commerce Cases

To construct the cases, I collected qualitative and quantitative data from several data sources, including semi-structured interviews, company websites, and publicly available online publications. In total, I conducted 18 semi-structured interviews lasting 30 to 70 minutes in person and via telephone over a period of two years (2017-2018). Informants included the founders and co-founders of new ventures, country managers, and other team members who were involved in the internationalization pro-

cess. I intensively analyzed the websites of the selected case companies and collected additional information on their internationalization by searching the web. Consequently, I triangulated data from primary sources in the field provided a rich overview of success factors in the internationalization of new e-commerce ventures.

I mitigated informant biases using several approaches recommended by Golden (1992) and Miller, Cardinal, and Glick (1997). First, I used interview guides, which asked for information about the internationalization of the new venture. Second, to triangulate the data, I gathered secondary data from multiple websites on the international behavior of the new ventures. Third, I assured the respondents that their responses would be kept confidential to encourage accurate responses (Eisenhardt & Graebner, 2007).

4.4 Findings

My empirical analysis results in two complementary sets of findings. First, I show that when considering the internationalization of new e-commerce ventures, a distinction must be made between the internationalization of the front end and the internationalization of the back end. I identify differences between the internationalization of the “client side” (i.e., the front end), which includes web shops and promotion activities, and the back end, which refers to server-related aspects. In particular, I find differences with regard to those aspects that need to be adjusted to foreign customers (front end) and those that are managed in the background and can be standardized across different countries.

Second, I find that certain success factors are relevant for either the front end or the back end, while others are relevant for both. Figure 4 summarizes these findings. While internationally oriented founders and strong advertising capabilities are highly relevant for the internationalization of the front end, a diverse skill set and a broad and reliable supplier network are key for the internationalization of the back end. Some factors, such as market selection based on big data analyses, internationally oriented investments, and extensive use of digital technologies, are crucial for the international success of both the front end and the back end. In the following, I explain these success factors in detail.

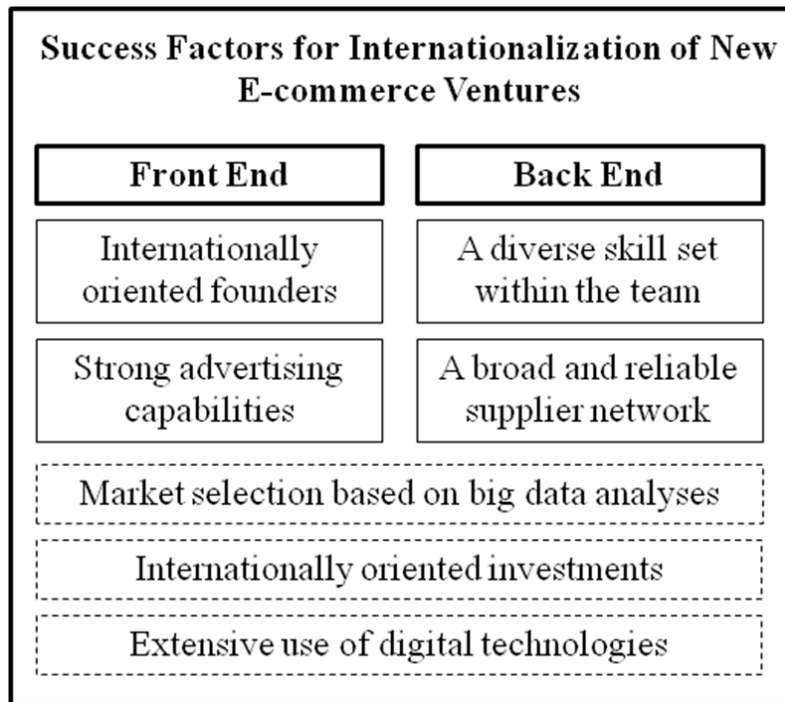


Figure 4: Overview of Success Factors for Internationalization of New E-commerce Ventures

4.4.1 Internationalization of the front end

The internationalization of the front end is a central outcome variable in this study. When assessing success factors for the internationalization of new e-commerce ventures, it is important to consider the particularities of the front end relative to those of the back end. The front end encompasses the web shop and supporting activities, such as advertising initiatives, which are visible to customers but only indirectly linked to products and services. Thus, the internationalization of the front end includes adjustments in the content of the web shop and advertising campaigns, such as product descriptions and product sizes (to fit country-specific sizing systems), as well as adoptions to country-specific style trends and patterns. In this regard, new e-commerce ventures also need to be aware of certain seals and labels that may be important to customers in foreign markets. In addition, the new ventures' web shops need to be adopted to each country's currency and taxes as well as local payment preferences. The web shop and advertising initiatives must also be adjustable to fit different devices. I identify two factors that are key for successful internationalization of the front end; 1) internationally oriented founders and 2) strong advertising capabilities.

4.4.1.1 Internationally oriented founders

Founders play an important role in the successful internationalization of the front end. In the selected cases, the initiation of internationalization was mainly concerned with the web shops. In those cases, founders with mindsets based on broader thinking were beneficial for internationalization. For instance, founders who saw the whole digital world as a market for their products or services, and who did not think in terms of borders had a positive impact on international success. This borderless thinking is even more important for success when combined with international experience. In the case studies, almost all founders had international experience, which they highlighted as supportive for the internationalization of their ventures.

Moreover, I find that internationally oriented founders with specific skills, such as analytical, agile-thinking, problem-solving, and customer-focused skills, are valuable for internationalization. These skills enable founders to see the bigger picture when entering foreign markets. In addition, good communication skills and a precise strategy are important. Thus, in my cases, founders who adopted a clear strategy for expanding to foreign markets were more successful than founders who did not adopt a clear internationalization strategy. Thus, internationally oriented founders are crucial for the internationalization of new e-commerce ventures.

4.4.1.2 Strong advertising capabilities

All of my interviewees stressed the importance of strong advertising capabilities as part of their marketing initiatives for success in foreign markets. New e-commerce ventures need to convince foreign customers of the value added of their products or services in order to be successful. In my case companies, strong web analytics skills were necessary for determining the appropriate advertising strategy for each country because web analytics are needed to identify local customer demands and preferences as well as to adopt the advertising approach accordingly.

All of the analyzed ventures also highlighted the need for affordable advertising campaigns due to the limited amount of available resources. Search marketing, including search-engine optimization, social-media campaigns (mainly on Instagram), online PR activities, interactive advertisements, and opt-in email services, was

mentioned as a driver of success in international markets. Moreover, my case companies indicated that brand awareness increased customers' trust and, consequently, resulted in a larger customer base, which gave rise to network effects. Interestingly, all of the case companies noted that advertising capabilities were particularly important for the front end (e.g., the web shop and product features), while none of the companies stressed a need to promote aspects of the back-end services (e.g., delivery time, payment options). Thus, strong advertising capabilities are a success factor for the internationalization of the front end of new e-commerce ventures.

4.4.2 Internationalization of the back end

The internationalization of the back end is the second central outcome variable in my study. When assessing success factors for the internationalization of new e-commerce ventures, the internationalization of the back end differs significantly from the internationalization of the front end. The back end activities of these ventures include managing warehouses, initiating shipping processes, and ordering new inventory. Especially helpful is the automation of back-end work processes to save time and money as well as to improve service quality. The analyzed cases offered two views regarding a successful back end. While the bigger ventures in my sample stressed the value of developing their own back end that was capable of serving different markets at the same time, the smaller ventures pointed to the benefits of using existing back-end programs (e.g., Salesforce). Nevertheless, the interviewees agreed that the back end should be easily adoptable to serve different mandates at the same time. Consequently, I identified two factors affecting the success of the internationalization of the back end; 1) a diverse skill set within the team and 2) a broad and reliable supplier network.

4.4.2.1 A diverse skill set within the team

In terms of human capital, a key finding of my study is that the founders are more important for the front end, while the team's skill set is more relevant for the back end. This is because the team is responsible for the operational tasks related to internationalization. The team should have multiple people with the technological

know-how needed to establish a back end that can serve the demands of different countries at the same time. In addition, the team should consist of people with complementary skills in such areas as finance, product development, and networking. Foreign-market knowledge is also key, and it can be acquired by including team members with extensive international experience or by hiring locals. Furthermore, all team members should be fluent in English and some of them should also be native speakers of the language in the new market. This is particularly beneficial in the establishment of foreign partnerships and in customer service. Consequently, the presence of a diverse team with multiple skills creates synergies that support the successful internationalization of the back end.

4.4.2.2 A broad and reliable supplier network

To ensure successful internationalization of the back end, new e-commerce ventures also need a broad and reliable network of operating partners. In all of the analyzed cases, the most important suppliers mentioned were the production suppliers, the shipping partners, and the payment processors. The production partners must be able to adjust production volumes and adopt the products to local standards (e.g., prices, product descriptions). Therefore, they must be able to connect to the venture's IT infrastructure. This implies that new e-commerce ventures need to develop automated access to their ordering systems through application programming interfaces (APIs) to ensure smooth communication. The availability of trustworthy suppliers allows new e-commerce ventures to outsource certain product-related administrative tasks to their partners and authorize the independent management of specific parts of the back end.

Furthermore, new e-commerce ventures need strong ties to well-established logistics and fulfilment partners who speak the local language and who are able to deliver trustworthy products within an appropriate timeframe. This helps ensure customer satisfaction, which is critical for success in foreign markets. In this regard, it is important for new ventures to connect logistics service providers to their internal systems through APIs. This allows customers to track their products and helps in the management of product returns, both of which support the international success of these ventures.

Moreover, new e-commerce ventures must ensure a smooth payment process that includes several payment options (at least credit cards and PayPal) that are adjusted to local standards. Consequently, new ventures need reliable payment processors who consider local customer preferences as well as standards, such as taxes or currencies. To ensure proper payment handling, the payment processors need to be linked to the new ventures' back end through APIs. In other words, to guarantee a smooth payment process, these ventures need to provide authority to the contractual payment partners to independently manage payment processes. In general, a broad and reliable supplier network is a success factor for the internationalization of the back end of new e-commerce ventures.

4.4.3 The internationalization of the front end and the back end

Several factors are relevant for the internationalization of both the back end and the front end. These success factors include 1) market selection based on big data, 2) internationally oriented investments, and 3) extensive use of digital technologies.

4.4.3.1 Market selection based on big data analyses

In all of the analyzed cases, the ventures stressed the importance of selecting an appropriate foreign market. In this regard, a variety of factors need to be taken into account and those factors require a comprehensive analysis. Such factors as local competitive behavior, local rules and regulations, distance to the home market, customer demand, customers' tastes and styles, and the ease of doing business were all mentioned as decision criteria. Therefore, in all of the analyzed cases, a comprehensive market analysis, preferably one that relies on big data, was underlined as success factor. Such analyses take a great deal of time and effort, and require appropriate tools that are able to handle and analyze massive amounts of data. In addition, in order to select appropriate markets for international activity, team members are needed who are able to interpret the outcomes of the analysis. My results show that international success is heavily dependent on the way in which market intelligence is generated and used for selecting foreign markets. Thus, market selecti-

on based on big data analysis is crucial for the international success of new e-commerce ventures.

4.4.3.2 Internationally oriented investments

New ventures typically have limited resources available. However, significant financial resources are needed to drive performance on foreign markets. On the one hand, a large investment is required to adjust the web shop to local standards and requirements and to increase brand awareness through advertising in each country of interest. On the other hand, a large amount of capital is necessary to develop a functional back end that can ensure smooth execution of operational tasks, such as logistics and payment handling. Thus, funds are required for the internationalization of both the front end and the back end. My interviewees noted that funding for internationalization is mainly provided by venture capitalists. In this regard, my respondents stated that the provided capital should not be bound to activities in the home market, but should be aimed at driving the venture's internationalization. Thus, in order to successfully establish the e-commerce business outside the home market, internationally oriented investments are crucial.

4.4.3.3 Extensive use of digital technologies

All of the analyzed cases highlighted the extensive use of modern digital technologies as a driver of successful internationalization of the front end and the back end. This is because digital technologies are the backbone of all new e-commerce ventures. For the front end, digital technologies are needed to ensure that the web shop can be easily adjusted in terms of, for instance, languages, currencies, or sizes. In addition, in order to be successful in foreign markets, new ventures should use state-of-the-art digital technologies in their web shops, such as 3D presentations of their products, product presentations in real-life settings, and customization options. Furthermore, my interviewees noted that most customers value personalized offers. Thus, in order to provide personalized services, new e-commerce ventures need digital technologies, such as machine-learning analytics, to understand customers' behavior patterns and affinities. This creates additional customer value and helps the firm differentiate itself

from the competition. The extensive use of digital technologies is also important for advertising initiatives aimed at acquiring foreign customers. Through the use of digital technologies that enable and support, for example, interactive advertisements or online partnerships, a wider audience can be reached in the foreign market. This, in turn, supports the international success of the new e-commerce venture.

Digital technologies are also important for creating a back end that is competitive in international markets, as digital technologies can be used to enhance processes, thereby resulting in increased efficiency. They can also add value to the products or services offered by the new venture, as customer service can be enhanced through the use of digital technologies. Moreover, digital technologies allow a significant amount of data to be collected, which can be used to improve operations, services, and other activities. Thus, by using current digital technologies, the development and spread of market intelligence becomes much easier, cheaper, and faster. The use of modern digital technologies for all back-end activities allows for enhanced stakeholder relationships as well as faster reactions to shifting customer demands and changing competitive behavior. Thus, the use of digital technologies is an important factor in the successful internationalization of new e-commerce ventures.

4.5 Discussion

As the number of new e-commerce ventures is on the rise, competition among the players continues to increase. As a way to stay competitive, internationalization requires careful resource management. As a clear understanding of the factors that play a role in this internationalization process is lacking, resource requirements are not met and many new online ventures that internationalize fail (Nummela et al., 2014). To help address these problems, I provide an overview of the distinct factors that affect the success of internationalization among new e-commerce ventures.

When considering the internationalization of new e-commerce ventures, a distinction needs to be made between the front end and the back end, as they differ considerably in terms of the degree of internationalization as well as with regards to the level of standardization. The front end, including the web shop and advertising initiatives, requires careful adaptation to the international context (e.g., adjustments of

the web shop's content, including product descriptions and sizes, adoptions to country-specific style trends and patterns, development of customer-specific advertising). The back end, including logistics management, the shipping process, and warehouse management, is frequently standardized across countries. Consequently, the resource requirements for the successful internationalization of the front end and the back end differ significantly. Thus, differentiating between the front end and the back end in the internationalization of new e-commerce ventures helps to identify specific requirements as well as the resources needed to be successful outside the home market. This finding is in line with previous research on standardization versus adaptation (Grant & Gregory, 1997), which highlights the potential to standardize some parts of a value chain when internationalizing, but also shows the need for adaption to local standards of other parts (Hieu & Truong, 2010).

With regards to the context-specific internationalization of the front end, my findings indicate that internationally oriented founders and strong advertising capabilities are key. This is mainly because the founders are the driving force for the initiation of internationalization, which mostly involves the web shop in the case of new e-commerce ventures. This finding is in line with results presented in the extant literature that highlight the importance of the founders for new venture internationalization (Oviatt & McDougall, 1994). For instance, previous research has shown that the founder of a new venture is responsible for choosing its growth strategy (Chandler & Hanks, 1994; Cliff, 1998). Thus, the presence of a founder who chooses internationalization as a growth strategy is vital for success on foreign markets. In addition, my results pointing to the significance of internationally oriented founders reflect, to some extent, findings indicating that the initial orientation of the founders in the early years of operations is decisive for the performance (Bamford, Dean, & Douglas, 2004; Park & Bae, 2004; Stinchcombe, 1965). Furthermore, I compliment findings from the literature that stress the significance of advertising capabilities as part of marketing initiatives for international success (Evers et al., 2012; Joensuu-Salo et al., 2018). My findings emphasize the fact that, for e-commerce ventures, advertising activities are primarily concerned with the web shop as well as the offered products and services (i.e., the front end) and are not related to back-end

activities. This supports Kowalik and Danik's (2019) results, which show that marketing activities revolving around clients' responsiveness and an understanding of clients are key for new ventures' international success. These authors also underline that marketing activities related to business processes do not affect success on foreign markets. Therefore, advertising activities are mainly a success factor for the internationalization of the front end for new e-commerce ventures. Investments in advertising activities can also help new ventures overcome the liability of newness (Chorev & Anderson, 2006), as those activities increase the firm's recognition in foreign markets, thereby expanding the customer base.

For the back end, I find that internationalization requires a team with a diverse skill set as well as a broad and reliable supplier network. In this regard, my findings confirm extant research that stresses the importance of human capital and networks for the international success of new ventures (Kiss & Danis, 2010; Ruzzier et al., 2007). For example, research has shown that a team with diverse skills is needed to execute the founder's objectives (Chandler & Hanks, 1994). Thus, even though the founders initiate the internationalization process, the team members are responsible for related back-end tasks that require a variety of different skills, such as the management of shipping and warehouses. As such, team members play a variety of roles that contribute not only to the daily operations of new e-commerce ventures but also to competitive advantages outside the home market. The team can, for instance, support the international export activity of new ventures using skills developed from previous experience or with their foreign market knowledge (Beleska-Spasova et al., 2012; Luostarinen & Gabrielsson, 2006). This is particularly important when new ventures internationalize (Hitt, Bierman, Uhlenbruck, & Shimizu, 2006). In addition, team members have a variety of contacts, which are vital for the new venture's network. Research has shown that networks are not only useful for gathering information and know-how about foreign markets (Zou, Liu, & Ghauri, 2010), but also for ensuring more efficient decision making in terms of, for example, supplier selection (Bužavaitė & Korsakienė, 2018). This results from the fact that new ventures' performance is positively influenced by networks with international business partners (Haddoud, Jones, & Newbery, 2017), which can help overcome the liability of smallness (Ko &

Liu, 2016). Thus, my findings pointing to both a diverse skill set and a broad and reliable supplier network as success factors are in line with extant research. However, I add to the literature by showing that the team's skill set and the supplier network are mainly responsible for the success of the back end, while they have little impact on the front end. This important differentiation should affect resource-allocation decisions when new e-commerce ventures engage in internationalization.

I also find that factors such as internationally oriented investments, extensive use of digital technologies, and market selection based on big data analysis are crucial for the successful internationalization of both the front end and the back end. With regard to the financial aspects, my results compliment findings in the extant literature suggesting that considerable investments are necessary to ensure growth in foreign markets (Zou et al., 2010). However, I add to the literature by showing that investments, mainly by venture capitalists, should be focused on foreign-market operations to ensure international success.

Moreover, my findings confirm investigations highlighting the importance of digital technologies for international success (Zhang et al., 2013). Research indicates that digital technologies are an important driver of market acceptance in foreign markets because they help, for example, to differentiate the product or service offering by introducing innovations or cutting costs (Covin, Slevin, & Heeley, 2000; Hsieh & Tsai, 2007; Teece, Pisano, & Shuen, 1997; Zou et al., 2010). In addition, state-of-the-art digital technologies can help the firm adapt its offerings to foreign market settings and recognize emerging technological developments (Zahra, Ireland, & Hitt, 2000; Zou et al., 2010), where the former can be beneficial for overcoming the liability of foreignness. This is particularly important for new e-commerce ventures, as their business models are based on digital technologies. Thus, digital technologies can build a foundation for growth and profitability based on competitive advantages (Spence & Crick, 2006; Zou et al., 2010).

Furthermore, in contrast to other research focused on such aspects of market selection as distance to the home market or similarity to the home market (Johanson & Vahlne, 1977; Johanson & Wiedersheim-Paul, 1975), my findings stress the importance of the use of big data for successful market selection. New e-commerce

ventures depend on the online behaviors of their customers, their purchasing patterns, and their preferences for services. At the same time, they also rely on the availability of the necessary infrastructure for such activities as shipping and delivery. As such, big data analysis is an appropriate method for market selection - it takes customer and market information into account, thereby ensuring a perfect fit between the new venture and the foreign market. This, in turn, should enhance the likelihood of international success.

4.6 Implications

4.6.1 Theoretical implications

My investigation of success factors in the internationalization of new e-commerce ventures contributes to the literature by adding to ongoing discussions about the internationalization of entrepreneurial firms (Abbad et al., 2011; Andersson, Evers, & Kuivalainen, 2014; Gruenhagen et al., 2018; Hadaya & Pellerin, 2008). As shown, the literature is differentiating between traditional and online new ventures in many aspects of internationalization, but not when assessing internal success factors for internationalization. I contribute to fill this research gap. My findings have two main theoretical implications. First, I demonstrate the distinctiveness of new online ventures using the example of new e-commerce ventures (Abbad et al., 2011; El Said & Galal-Edeen, 2009; Rialp et al., 2005). More specifically, I am among the first to highlight the importance of differentiating between the front end and the back end when considering success factors in the internationalization of new e-commerce ventures. Second, my findings highlight ways in which new e-commerce ventures can use internal resources to overcome the liabilities of newness, smallness, and foreignness (Djupdal & Westhead, 2015; Fornes & Cardoza, 2015; George, 2005; Joensuu-Salo et al., 2018; Schweizer, 2012; Symeonidou, 2013; Zaheer, 1995; Zahra, 2005). In general, my findings serve as a basis for additional research on the internationalization of new e-commerce ventures as representative of new online ventures.

4.6.2 Practical implications

By providing an overview of the success factors related to the front end and the back end in the internationalization of new e-commerce ventures, I contribute to a better understanding of the phenomenon that offers practitioners valuable insights for improving internationalization in the entrepreneurial e-commerce context. My findings have two sets of practical implications.

First, founders, co-founders, and team members can use my findings as guidance for the internationalization of their new e-commerce ventures. The fact that the international success of the front end mainly depends on the international orientation of the founders as well as advertising capabilities enables these ventures to assign their limited resources accordingly. For example, new e-commerce ventures can focus on promoting client-related aspects, such as the web shop itself, but avoid advertising related to back-end activities. Moreover, as my findings show that the back end's success mainly relies on a broad skill set and the supplier network, new e-commerce ventures would be well served to pay close attention to the skills needed to manage the back end when hiring team members. Alternatively, they can invest in developing the necessary skills during the internationalization process. In addition, these ventures can search for suppliers that are able to support internationalization due to prior international experience. These steps should help offset the drawbacks of internationalization, which is capital intensive and can result in an existential threat for new ventures due to their liability of smallness. Moreover, new e-commerce ventures can check whether their market selection is based on comprehensive big data analysis, which should help ensure that the right market choices are made. At the same time, when working with venture capitalists, these ventures should ensure that investments are not bound to business operations in the home market but are internationally oriented. My findings also suggest that new ventures need to build their businesses on state-of-the-art digital technologies. Thus, new ventures should establish a reasonable degree of digitalization from their inception, which will pay off during the internationalization process.

Second, by minimizing the failure rate for new e-commerce ventures that internationalize, my results should have positive effects for the economy as a whole.

New e-commerce ventures that internationalize create jobs, generate exports, and drive innovation. Thus, governments might have an interest in supporting them in their internationalization efforts.

4.7 Limitations and future research

Despite the theoretical and practical contributions of my findings, my article has several limitations that point to opportunities for future research. First, my study concentrates on new e-commerce ventures in Germany. I believe that Germany's entrepreneurial ecosystem has high global relevance, as highlighted, for example, by Startup Genome's "Global Startup Ecosystem Report 2019" in which Germany ranks seventh worldwide and second in Europe (Startup Genome, 2019). Nevertheless, as I focus on one country, it is unclear whether my results can be generalized to other countries. I expect similar results for other European countries, such as France, due to similarities in the entrepreneurial infrastructures. However, future research should investigate success factors for these ventures' internationalization in other countries.

Second, even though a qualitative study with ten cases is common in entrepreneurship research (Neubert, 2018), these cases cover only a small share of all new German e-commerce ventures that are active internationally. Future research should expand my study to confirm my findings or even generate additional insights about success factors in the internationalization of these ventures.

Third, the sample includes new ventures from different industries. Therefore, my results do not account for industry specifics. Future research could study the success factors for new e-commerce ventures in certain industries to develop an understanding of whether certain characteristics only apply to certain industries.

Fourth, in the discussion section, I compare success factors for the internationalization of new e-commerce ventures with corresponding findings in the literature on new traditional ventures. However, future research should directly compare traditional and online new ventures when studying potential success factors to provide more precise recommendations to founders, co-founders, and team members aiming to internationalize their new ventures.

4.8 References

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5 Research Paper IV

Outsourcing, information symmetry and governance The effects of retailers' formal and informal controls on manufacturers' outsourcing performance

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Abstract

The purpose of this paper is to investigate the effects of retailers' organizational controls and controls of their boundary personnel on manufacturers' outsourcing performance. Data were collected from 230 Indian apparel manufacturers engaged in outsourcing activities with two international retailers. Organizational control is scrutinized as formal and informal controls, and outsourcing performance is studied in terms of efficiency and effectiveness. The partial least squares approach is used to test the proposed research model. Findings show, first, the retailers' and the boundary person's formal controls have a direct, positive effect on outsourcing efficiency. Second, although no significant effect of the boundary person's formal controls on outsourcing effectiveness is identified, a significant effect of retailers' formal controls on effectiveness is seen. Third, the boundary person's informal controls are associated with a decrease in efficiency, whereas they have a positive effect on effectiveness. Fourth, although the retailers' informal controls enhance outsourcing effectiveness, they negatively affect efficiency. Fifth, information symmetry is statistically significant in enhancing outsourcing efficiency and effectiveness. The results have important implications for retailers and retailers' boundary personnel who are keen to improve their relations with manufacturers.¹¹

¹¹ This paper is published in the Journal of Enterprise Information Management, 2019, Vol. 32 No. 6, pp. 993-1014. The full paper can be found here:
<https://www.emerald.com/insight/content/doi/10.1108/JEIM-06-2018-0124/full/html>

6 Contribution and future research

This dissertation provides contributions for both academics and practitioners in the field of digitalization, internationalization and outsourcing for small, new and foreign firms. While each research paper provides unique theoretical and practical contributions, the research papers in their entirety enable an evaluation of general contributions to manage resource constraints in small, new and foreign firms.

6.1 Theoretical contribution

This thesis adds to existing theorizing in multiple ways. Overall, it advances the literature on how small, new and foreign firms are able to overcome the liabilities of smallness, newness and foreignness; contributes to fill existing research gaps identified in the literature in the field of digital entrepreneurship and control mechanisms in outsourcing relationships; as well as investigates the applicability of various theories on small, new and foreign firms with regards to digitalization, internationalization and outsourcing. This dissertation in its entirety provides six theoretical implications.

First, the findings of this dissertation contribute to the extant literature by offering strategic options to overcome the liabilities of smallness of firms (Djupdal & Westhead, 2015; Fackler, Schnabel, & Wagner, 2013). Research paper I and II demonstrate a variety of advantages of the usage of digital technologies, such as an increase in operational efficiency, thereby adding to the ongoing academic discussion how to save scarce resources in small firms (George, 2005). Research paper III identifies internationalization as an option to grow, thus, helping to increase the size of firms. This contributes to existing literature on how to increase the likelihood of survival as a small firm (Fackler et al., 2013). Research paper IV shows that formal control mechanisms are beneficial to improve outsourcing efficiency, for example, by saving input material. In this manner the results of this thesis contribute to the extant literature on resource efficiency of firms (Buckley, 1989; Penrose, 1959). Findings of the entire thesis, therefore, advance existing research on options to overcome liabilities of smallness through digitalization, internationalization and outsourcing relationships (Djupdal & Westhead, 2015; Fackler et al., 2013)

Second, results of this thesis complement existing research on the liabilities of newness (Djupdal & Westhead, 2015). The findings in research papers I, II and III highlight that digital technologies help to generate knowledge and skills. It is shown, for example, that digitalization increases the flexibility in developing market knowledge, thereby providing new firms with easier access to expertise. Consequently, new firms have no need to invest heavily in developing those intangible resources. In addition, the findings of research paper IV show that outsourcing partnerships assist firms in getting access to knowhow and knowledge. This is because firms can benefit from the experience of the outsourcing partner (Chaurasia, 2014; Kang, Wu, Hong, Park, & Park, 2014; Lagunes, Valle, & Castillo, 2016). The results of this dissertation, thus, contribute to the extant literature by underlining different ways to manage a lack of intangible resources, thereby overcoming the liability of newness (Barney, 1991; Fackler et al., 2013; Stinchcombe, 1965).

Third, the findings of this thesis add to the academic discussions how to manage the liabilities of foreignness (Fornes & Cardoza, 2015; Zaheer 1995). For instance, research paper III shows that firms, which base their business model on digital technologies, have easier access to foreign markets (e.g., through online platforms). This way, the results of this dissertation point out strategic options of managing unfamiliarity in foreign markets. Moreover, the results of research paper IV highlight outsourcing relationships as an option for small firms to grow internationally. Thus, this research paper emphasizes an alternative for firms to overcome a shortage of legitimacy in the foreign market (Fernhaber & McDougall-Covin, 2014; Zaheer, 1995). This dissertation in its entirety, consequently, contributes to the academic literature on how firms are able to handle the liabilities of foreignness (Symeonidou, 2013).

Fourth, the thesis contributes to fill existing research gaps in the field of digital entrepreneurship. For many years research on digitalization was mainly concerned with established firms rather than small and new ones (Devos, van Landeghem, & Deschoolmeester, 2010; Obwegeser, Araújo Burcharth, & Carugati, 2016). However, research missed to investigate aspects such as the impact of a digital strategy on the degree of digitalization of small and new firms. It further neglected to empirically investigate the benefits of digitalization for small and new firms as well as examine the

internal success factor in the internationalization of e-commerce firms. The findings of this dissertation add to the literature by emphasizing that a digital strategy is insufficient to achieve a high degree of digitalization. Research paper I finds the digitalization of products/services to be partially mediated by digital IT capabilities, and the effect of digital strategy on process digitalization to be fully mediated by digital IT capabilities and a digital culture. The results therefore add, on the one hand, to the theoretical discussion of strategy in the entrepreneurial context (Ott, Eisenhardt, & Bingham, 2017) and, on the other hand, to the discussion of the importance of IT capabilities (BarNir, Gallagher, & Auger, 2003; Châlons & Dufft, 2017; Parida, Sjödin, Lenka, & Wincent, 2015; Souza, Siqueira, & Reinhard, 2017) and a digital culture (El Sawy, Kræmmergaard, Amsinck, & Vinther, 2016). Research paper II shows that digitalization comes along with benefits such as increased operational efficiency and flexibility. Consequently, this dissertation answers current calls for research to study how digital technologies can shape the complex entrepreneurial environment (Ferreira, Ferreira, Fernandes, Jalali, Raposo, & Marques, 2016; Zhao & Collier, 2016). Besides highlighting the benefits of the usage of digital technologies in the internationalization of small and new e-commerce firms, this dissertation also shows that other success factors are of significance too, thereby confirming existing research (Acedo & Jones, 2007; Bollingtoft, Ulhoi, Madsen, & Neergaard, 2003; Evers, Andersson, & Hannibal, 2012; Gabrielsson & Gabrielsson, 2011; Gabrielsson, Sasi, & Darling, 2004; Kiss & Danis, 2010; Ruzzier, Antoncic, Hisrich, & Konecnik, 2007; Zhang, Sarker, & Sarker, 2013).

Fifth, with regards to control mechanisms in outsourcing relationships this thesis contributes to the discussion of how control mechanisms can mitigate risks in these relationships (Kang et al., 2014; Liu, Borman, & Gao, 2014). This dissertation adds to existing findings on control mechanisms by deriving detailed insights on the effect of formal and informal controls on outsourcing efficiency and effectiveness. In addition, a new perspective is added to the literature by highlighting that control mechanisms set by either the retailer or the boundary personnel do not have the same effects on outsourcing efficiency and effectiveness. This thesis, therefore, provides a starting

point for future research to investigate the differences of control mechanisms set by different authorities on different performance outcomes in outsourcing relationships.

Sixth, this dissertation in its entirety complements research on various theories that have been suggested by the extant literature, regarding their applicability to small, new and foreign firms. On the one hand, this thesis underlines the applicability of the RBV for small, new and foreign firms. In this regard, findings show that digitalization can be handled as resource in firms (Bharadwaj, 2000; Rivard, Raymond, & Verreault, 2006; Wade & Hulland, 2004). This dissertation, therefore, broadens the understanding of the RBV by adding the dimension of digitalization as resource. On the other hand, findings of this dissertation establish the applicability of the TCE theory in the field of control mechanisms (Lee, Shin, Haney, Kang, Li, & Ko, 2017; Ning, 2017). Overall, this thesis contributes to the academic discussion of the applicability of the RBV and TCE on small, new and foreign firms (Ekeledo & Sivakumar, 2004; Fornes & Cardoza, 2019; Hsu & Pereira, 2008; Joensuu-Salo, Sorama, Viljamaa, & Varamäki, 2018; Lee et al., 2017; Ning, 2017).

6.2 Practical contribution

In addition to the theoretical contributions, this paper based dissertation provides substantial practical contributions which are relevant to two groups of stakeholders. While the results of this dissertation arguably are important for small, new and foreign firms, they are also relevant for firm support initiatives, such as accelerators, as well as retailers and boundary personnel working together with firms in outsourcing relationships. This dissertation in its entirety provides four implications for practitioners.

First, the results of this dissertation help founders, co-founders and managers to overcome the liabilities of smallness by supporting small firms to better allocate the firms' limited amount of resources. This is because the findings of this dissertation highlight in research paper I practices to influence the degree of digitalization. The findings of this thesis further emphasize that a high degree of digitalization does not result in a direct reduction of resources, such as human capital or office space needed in case of small and new firms. Consequently, founders and managers should not aim for decreasing the number of employees or the size of office space, when investing in

digitalization. Instead, findings of research paper II highlight that digitalization contributes to increased operational efficiency, including less routine work. Founders and managers can use these insights when opting for a higher degree of digitalization in their small and new firm. Moreover, the results of this thesis support founders and managers of small and new e-commerce firms in deciding which factors they should focus on, when internationalizing and, thus, assign their limited resources accordingly. For example, the results of research paper III show that front and back end activities differ considerably in terms of the degree of internationalization as well as the level of standardization across countries. To save resources, founders and managers are well advised to increase standardization of the back end activities such as the logistics management, the shipping process, and the warehouse management. Furthermore, the results of research paper IV show how outsourcing efficiency can be increased with the help of formal control mechanisms by retailers and the boundary personnel. Consequently, the resource input to produce a desired outcome by small firms can be decreased. Eventually, the findings of this dissertation have several advises for practitioners how to overcome the liabilities of smallness.

Second, the findings of this dissertation support founders and managers of firms to overcome the liabilities of newness. The results of this dissertation support founders and managers of small and new firms not only in terms of saving valuable resources, but also in terms of creating competitive advantages. For example, the findings of research paper I assist founders and managers of small and new firms in increasing firm's degree of digitalization. This can result in faster response times and a better collaboration as shown in research paper II. Thus, small and new firms are able to improve their efforts to adapt and differentiate from the competition. As the findings of research paper III provide a detailed understanding of success factors in the internationalization of small and new e-commerce firms, they help firms to grow, thereby increasing the overall awareness. Furthermore, the results of research paper IV provide insights about ways to mitigate risks in outsourcing relationships through control mechanisms. As a result, outsourcing performance by the manufacturers can be improved. Ultimately, the findings of this thesis have practical implications on how firms are able to handle the liabilities of newness.

Third, the results of this dissertation provide insights for founders and managers of small, new and foreign firms in overcoming the liability of foreignness. By increasing the degree of digitalization firms can attain greater market flexibility, as indicated by the results of research papers I and II. Digitalization, thus, can help firms to be able to react quickly to changing market conditions. The results of research paper III, additionally, provide a detailed overview of which success factors are relevant in the internationalization of e-commerce firms. Founders and managers can use this knowledge by developing a broad supplier network to improve back end services when entering foreign markets. Thus, firms can source suppliers that are able to support internationalization due to prior international experience. As a result, this dissertation provides firms with practical insights in managing the liability of foreignness.

Fourth, findings assist external stakeholders to better collaborate with small, new and foreign firms. For instance, the results of research paper I show that the effect of a digital strategy on the digitalization of processes is fully mediated by the digital IT capabilities. This finding can be used by founder-support initiatives, such as accelerators, by providing the necessary IT infrastructure to foster a faster digitalization of small and new firms. Furthermore, as the findings of research paper I underline that the influence of a digital strategy on digital processes is mediated by a digital culture, founder-support initiatives should endorse the implementation of a digital culture. This can be done, for example, by providing trainings or facilitating a failure-tolerating culture. Moreover, as the results of research paper III highlight the necessity of a differentiation between front and back end in terms of e-commerce firms' success factors in their internationalization, founder support initiatives may assist with providing internationally oriented investments for the development of the back end. Moreover, the findings of this dissertation have significant implications for retailers and their boundary personnel who are keen to improve their relations with manufacturers. In this regard, research paper IV provides a detailed overview of the differences in setting formal and informal controls by either the retailer or the boundary person. Thus, retailers and boundary personnel should acknowledge the distinct impact on outsourcing performance and should adopt their behavior accordingly. This way, retailers and

boundary personnel can utilize control mechanisms to achieve satisfactory outsourcing performance and avoid potential downsides of this partnership.

To conclude, this dissertation provides multiple theoretical and practical implications. The findings contribute to research in the field of overcoming liabilities of smallness, newness and foreignness as well as adds to the academic discussion on digital entrepreneurship, including digitalization and internationalization aspects, and control mechanisms in outsourcing relationships. In addition, practitioners benefit from unique empirical insights on the effects of the usage of digital technologies in small, new and foreign firms as well as on the effect of formal and informal controls set by either retailers or the respective boundary personnel on the outsourcing performance of small manufacturers.

6.3 Limitations and future research

The four research papers comprising this dissertation have some limitations that point to opportunities for future research. First, all of the four research papers concentrate on a single country context. Research papers I to III investigate firms from Germany, while research paper IV assesses firms from India. As a result, generalizability is limited. Even though the results of research papers I to III might generalize to other homogenous countries, such as the United Kingdom or to France, future studies should validate the findings of this dissertation in other European countries. In particular, future research should investigate countries from a different stratum in the digitalization index (see e.g., Chakravorti, Bhalla, & Chaturvedi, 2017). The limitation of a single country context is also relevant in research paper IV. India serves as a good example to study control mechanisms in outsourcing relationships due to the fact that the Indian business process outsourcing (BPO) market accounts for approximately half of the BPO market worldwide (Jayaraman, Narayanan, Luo, & Swaminathan, 2013). However, future studies might investigate other emerging markets such as Brazil or China to confirm the applicability of the results of research paper IV in other countries. In this regard, factors such as the size of the market, the legal system or the economic development of the countries should be considered (Jayaraman et al., 2013).

Second, the empirical analyses of all four research papers use respondents' self-assessment, which could be positively biased and, thus, could influence the results. For example, research papers I and II refer to entrepreneurs' self-assessments to study the degree of digitalization of their firms. It is possible that entrepreneurs provide a more positive assessment of their usage of digital technologies to appear more attractive. A possible positively biased assessment might also be the case in research papers III and IV. Entrepreneurs might tend to avoid talking about the failures in their internationalization attempts to present their firm in the best possible light and manufacturers might pretend to have a good outsourcing performance to seem better than the competition. However, to avoid biases through self-assessment, all respondents of the four research papers were ensured that data would be kept anonymous. In addition, common method variances were tested for the quantitative research papers (see results of research paper I, II and IV). However, future studies should validate the findings of the research papers comprising this dissertation by, for example, referring to longitudinal or observational studies instead of cross-sectional ones.

Third, the research papers of this dissertation are not consistent with regards to the industry focus. Research papers I and II do not focus on a specific industry. To check for potential biases resulting from the missing industry focus, the industry was included as control variable in these two empirical studies (see results of research paper I and II). However, future research could investigate the degree of digitalization and the resulting benefits for firms for specific industries. While research paper III investigates the success factors in the internationalization of e-commerce firms, it does not focus on a specific type of industry with respect to the product or service sold. Thus, future research could validate the findings in a particular industry as results might vary depending on the type of product or service sold. In contrast, research paper IV focuses on a single industry, the textile industry. The apparel industry is a common example to study control mechanisms in outsourcing relationships (Holtgrave, Nienaber, & Ferreira, 2017) as the characteristics of the industry such as short product lifecycles, intense competition and ever-changing demand are similar to other industries such as, for example, toys or footwear (Chen & Fung, 2013; De Brito, Carbone, & Blanquart, 2008; Holtgrave et al., 2017). Eventually, future research should study

the influence of control mechanisms on the outsourcing performance across diverse industries to validate the findings presented in research paper IV.

Despite these limitations, this dissertation in its entirety enriches research on options to manage resource constraints in small, new and foreign firms. In addition, the four research papers comprising this thesis point to several avenues for future research.

6.4 References

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